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THE

ENCYCLOPÆDIA BRITANNICA.

A

DICTIONARY

OF

ARTS, SCIENCES, AND GENERAL LITERATURE.

NINTH EDITION.

(AMERICAN REPRINT.)

VOLUME IX.

PHILADELPHIA:
J. M. STODDART & CO.
1879.

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ENCYCLOPÆDIA BRITANNICA.

FALABA, a town of West Africa, about 190 miles N.W. of Freetown in Sierra Leone, at the foot of the Konkodugor, and on the Fala River, a tributary of the Little Scarcies. It was founded by the Sulimas, who revolted from the Mahometan Foulas, and its warlike inhabitants soon attained supremacy over the neighboring villages and country. The defences consist of a lofty stockade, and a moat about 20 feet deep and as many in breadth. From a distance the town appears like a grove of silk-cotton trees, and only at intervals are the brown roofs seen peering through the foliage. Major Laing about 1825 estimated the number of huts at about 4000. They are arranged in clusters round squares or court-yards, and though only built of clay are neat and even elegant. Winwood Reade, who was detained in the town during his Niger journey in 1869, has given a graphic description of life in Falaba in his *African Sketch Book*, vol. ii., 1873. See also Laing, *Travels in W. Africa*, 1825.

FALAISE, a town of France, the capital of an arrondissement in the department of Calvados, is situated on the right bank of the Ante, 21 miles S. by E. of Caen. It was formerly a place of some strength, and is still surrounded by old walls. The principal object of interest is the castle, now partly in ruins, but formerly the seat of the dukes of Normandy, and the birthplace of William the Conqueror. Near the castle, in the Place de la Trinité, is an equestrian statue in bronze of William the Conqueror, by Louis Rodel. Falaise has two large and populous suburbs, one of which, Guibray, rivals in size and importance the town itself, and is celebrated for its annual fair, which lasts from 10th to 25th August. The town contains a town-hall, a hospital, a theatre, several ancient churches, and a public library. The manufactures are chiefly cotton goods, hosiery, leather, and paper. The population in 1872 was 7749.

FALASHAS (*i. e.*, Exiles), the degenerate Jews of Abyssinia, found in considerable numbers in the provinces west of Takazze, namely, Semien, Wogara, Armatshoho, Walkait, Tchelga, Dembea, Tenkel, Dagusa, Alafa, Kunsula, Aschafer, Agarv-Meder, and Quara. It is doubtful whether they are to be ethnologically identified with the seed of Abraham, or regarded, like the Khazars of the 8th century, as, for the most part, mere proselytes to Judaism. As to the date when the race or the religion was introduced there is no authentic information,—one account carrying it back to the days of Solomon and his hypothetical son Menelek by the queen of Sheba, another to the time of the Babylonian captivity, and a third only to the 1st century of the Christian era. That one or other of the earlier dates is probably correct may be gathered from the fact that the Falashas know nothing of either the Babylonian or Jerusalem Talmud, make no use of the *tephilin*, and observe neither the feast of Purim nor the dedication of the Temple. They possess —not in Hebrew, of which they are altogether ignorant, but in Ethiopic (or Geez)—the canonical and apocryphal books of the Old Testament; a volume of extracts from the Pentateuch, with comments given to Moses by God on Mount Sinai; the Te-e-sa-sa Sanbat, or laws of the Sabbath; the Ardit, a book of secrets revealed to twelve saints, which is used as a charm against disease; lives of Abraham, Moses, etc.; and a translation of Josephus called Sana Aihud. A copy of the Orit or Mosaic law is kept in the holy of holies in every mesgeed or synagogue. Various pagan observances are mingled in their ritual: every newly-built house is considered uninhabitable till the blood of a sheep or fowl has been spilt in it; a woman guilty of a breach of chastity has to undergo purification by leaping into a flaming fire; the Sabbath has been deified and, as the goddess Sanbat, receives adoration and sacrifice, and is said to have ten thousand times ten thousand angels to wait on her commands. There is a monastic system, introduced it is said in the 4th century A.D. by Aba Zebra, a pious man who retired from the world and lived in the cave of Hoharewa, in the province of Armatshoho. The monks must prepare all their food with their own hands, and no lay person, male or female, may enter their houses. Celibacy is not practised by the priests, but they are not allowed to marry a second time, and no one is admitted into the order who has eaten bread with a Christian, or is the son or grandson of a man thus contaminated. Belief in the evil eye or shadow is universal, and spirit-raisers, soothsayers, and rain-doctors are in repute. Education is in the hands of the monks and priests, and is confined to boys. Fasts, obligatory on all above seven years of age, are held on every Monday and Thursday, on every new moon, and at the passover (the 21st or 22d of April). The annual festivals are the passover, the harvest feast, the Baala Mazâlat or feast of tabernacles (during which, however, no booths are built), the day of covenant or assembly, and Abraham's day. It is believed that after death the soul remains in a place of darkness till the third day, when the first *taskar* or sacrifice for the dead is offered; prayers are read in the mesgeed for the repose of the departed, and for seven days a formal lament takes place every morning in his house. No coffins are used, and a stone vault is built over the corpse so that it may not come into direct contact with the earth. The Falashas are an industrious people, living for the most part in villages of their own, or, if they settle in a Christian or Mahometan town, occupying a separate quarter. They engage in agriculture, manufacture pottery, iron ware, and cloth, and are specially sought after for their skill in mason-work. Their numbers are variously estimated at from 80,000 to 200,000.

See Nott and Gliddon, *Types of Mankind*, 1868; Flad, *Zwölf Jahre in Abyssinia*, Basel, 1869, and his *Falashes of Abyssinia*, translated from the German by S. P. Goodhart, London, 1869.

FALCON (Latin, *Falco;*[1] French, *Faucon;* Teutonic, *Falk* or *Valken*), a word now restricted to the high-couraged and long-winged Birds-of-Prey which take their quarry as it moves; but formerly it had a very different meaning, being by the naturalists of the last and even of the present century extended to a great number of birds comprised in the genus *Falco* of Linnæus and writers of his day,[2] while, on the other hand, by falconers, it was, and still is, technically limited to the *female* of the birds employed by them in their vocation (see Falconry), whether "long-winged" and therefore "noble," or "short-winged" and "ignoble."

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[1] Unknown to classical writers the earliest use of this word is said to be by Servius Honoratus (*circa* 390–480 A.D.) in his notes on *Æn.* lib. x. vers. 145. It seems possibly to be the Latinized form of the Teutonic *Falk*, though *falx* is commonly accounted its root.

[2] The nomenclature of nearly all the older writers on this point is extremely confused, and the attempt to unravel it would hardly repay the trouble, and would undoubtedly occupy more space than could here be allowed. What many of them, even so lately as Pennant's time, termed the "Gentle Falcon" is certainly the bird we now call the Gos-Hawk (*i. e.*, Goose-Hawk), which name itself may have been transferred to the *Astur palumbarius* of modern ornithologists from one of the long-winged Birds-of-Prey.

According to modern usage, the majority of the Falcons, in the sense first given, may be separated into *five* very distinct groups:—(1) the Falcons pure and simple (*Falco* proper); (2) the large northern Falcons (*Hierofalco*, Cuvier); (3) the "Desert Falcons" (*Gennœa*, Kaup); (4) the Merlins (*Æsalon*, Kaup); and (5) the Hobbies (*Hypotriorchis*, Boie). The precise order in which these should be ranked need not concern us here, but it must be mentioned that a sixth group, the Kestrels (*Tinnunculus*, Vieillot) is often added to them. This, however, appears to have been justifiably reckoned a distinct genus, and its consideration may for the present be deferred.

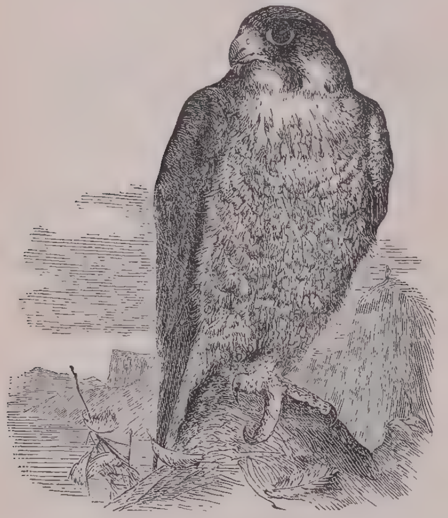

Fig. 1.—Peregrine Falcon.

The typical Falcon is by common consent allowed to be that almost cosmopolitan species to which unfortunately the English epithet "peregrine" (*i.e.*, strange or wandering) has been attached. It is the *Falco peregrinus* of Tunstall (1771) and of most recent ornithologists, though some[1] prefer the specific name *communis* applied by J. F. Gmelin a few years later (1788) to a bird which, if his diagnosis be correct, could not have been a true Falcon at all, since it had yellow irides—a color never met with in the eyes of any bird now called by naturalists a "Falcon." This species inhabits suitable localities throughout the greater part of the globe, though examples from North America have by some received specific recognition as *F. anatum*—the "Duck-Hawk," and those from Australia have been described as distinct under the name of *F. melanogenys*. Here, as in so many other cases, it is almost impossible to decide as to which forms should, and which should not, be accounted merely local races. In size not surpassing a Raven, this Falcon (fig. 1) is perhaps the most powerful Bird-of-Prey for its bulk that flies, and its courage is not less than its power. It is the species, in Europe, most commonly trained for the sport of hawking (see Falconry). Volumes have been written upon it, and to attempt a complete account of it is, within the limits now available, impossible. The plumage of the adult is generally blackish-blue above, and white, with a more or less deep cream-colored tinge, beneath—the lower parts, except the chin and throat, being barred transversely with black, while a black patch extends from the bill to the ear-coverts, and descends on either side beneath the mandible. The young have the upper parts deep blackish-brown, and the lower white, more or less strongly tinged with ochraceous-brown, and striped longitudinally with blackish-brown. From Port Kennedy, the most northern part of the American continent, to Tasmania, and from the shores of the Sea of Ochotsk to Mendoza in the Argentine territory, there is scarcely a country in which this Falcon has not been found. Specimens have been received from the Cape of Good Hope, and it is only a question of the technical differentiation of species whether it does not extend to Cape Horn. Fearless as it is, and adapting itself to almost every circumstance, it will form its eyry equally on the sea-washed cliffs, the craggy mountains, or (though more rarely) the drier spots of a marsh in the northern hemisphere, as on trees (says Schlegel) in the forests of Java, or the waterless ravines of Australia. In the United Kingdom it was formerly very common, and hardly a high rock from the Shetlands to the Isle of Wight but had a pair as its tenants. But the British gamekeeper has long held the mistaken faith that it is his worst foe, and the number of pairs which are now allowed to rear their brood unmolested in these islands must be small indeed. Yet its utility to the game-preserver, by destroying every one of his most precious wards that shows any sign of infirmity, can hardly be questioned by reason, and no one has more earnestly urged its claims to protection than Mr. G. E. Freeman (*Falconry*, etc., p. 10).[2] Nearly allied to this Falcon are several species of which it is impossible here to treat at length, such as *F. barbarus* of Mauritania, *F. minor* of South Africa, the Asiatic *F. babylonicus*, *F. peregrinator* of India—the Shaheen, and perhaps *F. cassini* of South America, with some others.

Next to the typical Falcons comes a group known as the "great northern" Falcons (*Hierofalco*). Of these the most remarkable is the Gyrfalcon (*F. gyrfalco*), whose home is in the Scandinavian mountains, though the young are yearly visitants to the plains of Holland and Germany. In plumage it very much resembles *F. peregrinus*, but its flanks have generally a bluer tinge, and its superiority in size is at once manifest. Nearly allied to it is the Icelander (*F. islandus*), which externally differs in its paler coloring, and in almost entirely wanting the black mandibular patch. Its proportions, however, differ a good deal, its body being elongated. Its country is shown by its name, but it also inhabits South Greenland, and not unfrequently makes its way to the British Islands. Very close to this comes the Greenland Falcon (*F. candicans*), a native of North Greenland, and perhaps of other countries within the Arctic circle. Like the last, the Greenland Falcon from time to time occurs in the United Kingdom, but it is always to be distinguished by wearing a plumage in which at every age the prevailing color is pure white. In North-Eastern America these birds are replaced by a kindred form (*F. labradorus*) first detected by Audubon, and lately recognized by Mr. Dresser (*Orn. Miscell.*, i. p. 135). It is at once distinguished by its very dark coloring, the lower parts being occasionally almost as deeply tinted at all ages as the upper.

All the birds hitherto named possess one character in common. The darker markings of their plumage are longitudinal before the first real moult takes place, and for ever afterwards are transverse. In other words, when young the markings are in form of stripes, when old in form of bars. The variation of tint is very great, especially in *F. peregrinus*; but the experience of falconers, whose business it is to keep their birds in the very highest condition, shows that a Falcon of either of these groups if light-colored in youth is light-colored when adult, and if dark when young is also dark when old—age, *after the first moult*, making no difference in the complexion of the bird. The next group is that of the so-called "Desert Falcons" (*Gennœa*), wherein the difference just indicated does not obtain, for long as the bird may live and often as it may moult, the original style of markings never gives way to any other. Foremost among these are to be considered the Lanner and the Saker (commonly termed *F. lanarius* and *F. sacer*), both well known in the palmy days of Falconry, but only within the last forty years or so re-admitted to full recognition. Both of these birds belong properly to South-eastern Europe, North Africa, and South-western Asia. They are, for their bulk, less powerful than the members of the preceding group, and though they may be trained to high flights are naturally captors of humbler game. The precise number of species belonging here is very doubtful, but among the many candidates for recognition are especially to be named the Lugger (*F. jugger*) of India, and the Prairie Falcon (*F. mexicanus*) of the western plains of North America.

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[1] Among them Mr. Sharpe, who, in his recent *Catalogue of the Birds in the British Museum*, has besides rejected much of the evidence that the experience of those who have devoted years of study to the Falcons has supplied.

[2] It is not to be inferred, however, as many writers have done, that Falcons habitually prey upon birds in which disease has made any serious progress. Such birds meet their fate from the less noble *Accipitres*, or predatory animals of many kinds. But when a bird is *first* affected by any disorder, its power of taking care of itself is at once impaired, and hence in the majority of cases it may become an easy victim under circumstances which would enable a perfectly sound bird to escape from the attack even of a Falcon.

The systematist finds it hard to decide in what group he should place two somewhat large Australian species (*F. hypoleucus* and *F. subniger*), both of which are rare in collections—the latter especially; and, until more is known about them, their position must remain doubtful.

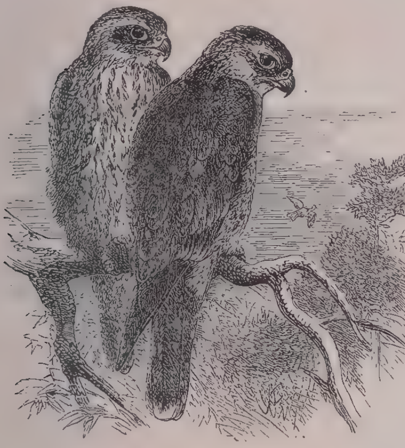

Fig. 2.—Merlin.

We have then a small but very beautiful group—the Merlins[1] (*Æsalon* of some writers, *Lithofalco* of others). The European Merlin (*F. æsalon*) is perhaps the boldest of the *Accipitres*, not hesitating to attack birds of twice its own size, and even on occasion threatening human beings. Yet it readily becomes tame, if not affectionate, when reclaimed, and its ordinary prey consists of the smaller *Passeres.* Its "pinion of glossy blue" has become almost proverbial, and a deep ruddy blush suffuses its lower parts; but these are characteristic only of the male—the female maintaining very nearly the sober brown plumage she wore when as a nestling she left her lowly cradle in the heather. Very close to this bird comes the Pigeon-Hawk (*F. columbarius*) of North America—so close, indeed, that none but an expert ornithologist can detect the difference. The Turumti of Anglo-Indians (*F. chicquera*), and its representative from Southern Africa (*F. ruficollis*), also belong to this group, but they are considerably larger than either of the former.

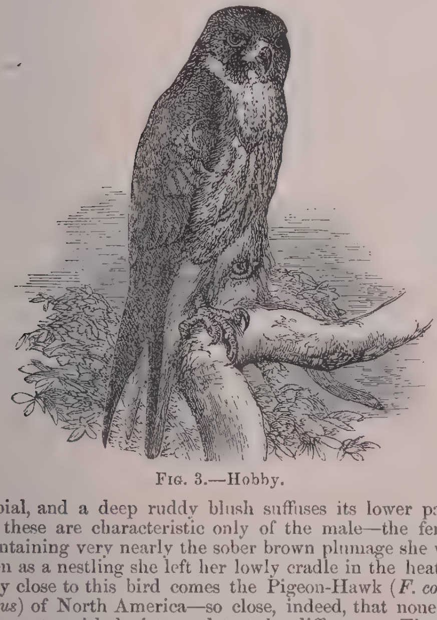

Fig. 3.—Hobby.

Lastly, we have the Hobbies (*Hypotriorchis*), comprising a greater number of forms—though how many seems to be doubtful. They are in life at once recognizable by their bold upstanding position, and at any time by their long wings. The type of this group is the English Hobby (*F. subbuteo*), a bird of great power of flight, chiefly used in the capture of insects, which form its ordinary food. It is a summer visitant to most parts of Europe, including these islands, and is most wantonly and needlessly destroyed by gamekeepers. A second European species of the group is the beautiful *F. eleonoræ*, which hardly comes further north than the countries bordering the Mediterranean, and, though in some places abundant, is an extremely local bird. The largest species of this section seems to be the Neotropical *F. femoralis*, for *F. diroleucus* though often ranked here is now supposed to belong to the group of typical Falcons. (A. N.)

FALCONE, Aniello (1600–1665), a battle-painter, was the son of a tradesman, and was born in Naples. He showed his artistic tendency at an early age, received some instruction from a relative, and then studied under Ribera (Lo Spagnoletto), of whom he ranks as the most eminent pupil. Besides battle-pictures, large and small, taken from biblical as well as secular history, he painted various religious subjects, which, however, count for little in his general reputation. He became, as a battle-painter, almost as celebrated as Borgognone (Courtois), and was named "L'Oracolo delle Battaglie." His works have animation, variety, truth to nature, and careful color. Falcone was bold, generous, used to arms, and an excellent fencer. In the insurrection of Masaniello (1647) he resolved to be bloodily avenged for the death, at the hands of two Spaniards, of a nephew and of a pupil in the school of art which he had established in Naples. He and many of his scholars, including Salvator Rosa and Carlo Coppola, formed an armed band named the Compagnia della Morte. They scoured the streets by day, exulting in slaughter; at night they were painters again, and handled the brush with impetuous zeal. Peace being restored, they had to decamp. Falcone and Rosa made off to Rome; here Borgognone noticed the works of Falcone, and became his friend, and a French gentleman induced him to go to France, where Louis XIV. became one of his patrons. Ultimately Colbert obtained permission for the painter to return to Naples, and there he died in 1665. Two of his battle-pieces are to be seen in the Louvre and in the Naples museum; he painted a portrait of Masaniello, and engraved a few plates. Among his principal scholars, besides Rosa and Coppola (whose works are sometimes ascribed to Falcone himself), were Domenico Gargiuolo named Micco Spadaro, Paolo Porpora, and Andrea di Lione.

FALCONER, Hugh (1808–1865), a distinguished palæontologist and botanist, descended from an old Scotch family, was born at Forres, 29th February, 1808. In 1826 he graduated as M. A. at Aberdeen, where he began to manifest a decided taste for the study of natural history and botany. He afterwards studied medicine in the university of Edinburgh, taking the degree of M.D. in 1829 Proceeding to India in 1830 as assistant-surgeon on th Bengal establishment of the East India Company, he made on his arrival an examination of the fossil bones from Ava in the possession of the Asiatic Society of Bengal, and a description of the collection which he published immediately gave him a recognized position among the scientists of India. In 1831 he was appointed to the army station at Meerut, in the north-western provinces, and in 1832 he succeeded his friend Dr. Royle as superintendent of the botanic garden of Saharunpoor. He was thus placed in a district particularly rich in palæontological remains, the existence of which was, however, then unknown; and he immediately set to work to investigate both its natural history and geology. In 1834 he published a description of the geological character of the neighboring Sewalik hills, in the Tertiary strata of which he discovered bones of crocodiles, tortoises, and other fossil remains; and subsequently, along with other conjoint laborers, he brought to light a sub-tropical fossil fauna of unexampled extent and richness. For these valuable discoveries he and Captain Cautley received in 1837 the Wollaston medal in duplicate from the Geological Society of London. In 1834 Falconer was appointed to inquire into the fitness of India for the growth of the tea-plant, and it was on his recommendation that it was introduced into that country. He also made large natural history collections, not only of the productions of the country round Saharunpoor, but also of the valley of Kashmir and the countries to the north of it, exploring at the same time the glacier on the southern flank of the Muztagh range, and the great glaciers of Arindoh and of the Braldoh valley. He was compelled by illness to leave India in 1842, and during his stay in England, besides reading various papers on his discoveries before several learned societies, he occupied himself with the classification and arrangement of the Indian fossils presented to the British Museum and East India House, chiefly by himself and Captain Cautley. In 1848 he was appointed superintendent of the Calcutta botanical garden, and professor of botany in the medical college; and on entering on his duties he was at once employed by the Indian Government and the Agricultural and Horticultural Society as their adviser on all matters connected with the vegetable products of India. Being compelled by the state of his health to leave India in 1855, he spent the remainder of his life chiefly in examining fossil species in England and the Continent corresponding to those which he had discovered in India. In the course of his researches he became interested in the question of the antiquity of the human race, and actually commenced a work on "Primeval Man," which, however, he was not spared to finish. He died 31st January, 1865. He was a member of many learned societies, both British and foreign. Shortly after his death a committee was formed for the promotion of a "Falconer Memorial." This took the shape of a marble bust, which was placed in the rooms of the Royal Society of London, and of a Falconer scholarship of the annual value of £100, open for competition to graduates in science or medicine of the university of Edinburgh.

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[1] French, *Émerillon;* Icelandic, *Smirill.*

Dr. Falconer's botanical notes, with 450 colored drawings of Kashmir and Indian plants, have been deposited in the library at Kew, and his *Palæontological Memoirs and Notes*, comprising all his papers read before learned societies, have been edited, with a biographical sketch, by Charles Murchison, M.D., London, 1868.

FALCONER, **William**, our greatest naval poet,—Charles Dibdin taking rank as second,—was born in Edinburgh, February 11, 1732. His father was a wig-maker, and carried on business in one of the small shops with wooden fronts at the Netherbow Port, an antique castellated structure which remained till 1764, dividing High Street from the Canongate. The old man, who is described as a sort of humorist, was unfortunate. Of his three children two were deaf and dumb; he became bankrupt, then tried business as a grocer, and finally died in extreme poverty. William, the son, having received a scanty education, was put to sea. He served on board a Leith merchant vessel, and in his eighteenth year was fortunate enough to obtain the appointment of second mate of the "Britannia," a vessel employed in the Levant trade, and sailed from Alexandria for Venice. The "Britannia" was overtaken by a dreadful storm off Cape Colonna and was wrecked, only three of the crew being saved. Falconer was happily one of the three, and the incidents of the voyage and its disastrous termination formed the subject of his poem of *The Shipwreck*. "In all Attica," says Byron, "if we except Athens itself and Marathon, there is no scene more interesting than Cape Colonna. To the antiquary and artist, sixteen columns are an inexhaustible source of observation and design; to the philosopher the supposed scene of Plato's conversations will not be unwelcome; and the traveller will be struck with the beauty of the prospect over 'isles that crown the Ægean deep.' But for an Englishman Colonna has yet an additional interest, as the actual spot of Falconer's *Shipwreck*. Pallas and Plato are forgotten in the recollection of Falconer and Campbell—

'Here in the dead of night, by Lonna's steep,
The seaman's cry was heard along the deep.'"

After the wreck of the "Britannia" and his return to England, Falconer, in his nineteenth year, appeared as a poet. He printed at Edinburgh an elegy on Frederick, prince of Wales,—a puerile inflated performance,—and afterwards contributed short pieces to the *Gentleman's Magazine*. Some of these descriptive and lyrical effusions possess merit. The fine naval song of *The Storm* ("Cease, rude Boreas"), reputed to be by George Alexander Stevens, the dramatic writer and lecturer, has been ascribed to Falconer, but apparently on no authority. It is foreign to his usual style. Had he been the author he would assuredly have claimed it. Falconer continued in the merchant service until the spring of 1762, when he gained the patronage of Edward, duke of York, by dedicating to him his poem of *The Shipwreck*, which appeared in May of that year, "printed for the author." The duke advised him to enter the royal navy, and before the end of summer the poet-sailor was rated as a midshipman on board the "Royal George." But as this ship was paid off at the peace of 1763, and as Falconer's period of service had been too short to enable him to obtain the commission of lieutenant, he was advised to exchange the military for the civil department of the navy, and in the course of the same year he received an appointment as purser of the "Glory" frigate, a situation which he held until that vessel was laid up on ordinary at Chatham. In 1764 he published a new edition of *The Shipwreck*, corrected and enlarged, and printed, not for the author, as in the former instance, but for Andrew Millar, the publisher of Hume and Robertson, and whom Johnson called the Mæcenas of the age. About nine hundred lines were added to this new edition of the poem, including what may be termed its character-painting and elaborated description and episodes. In the same year, 1764, Falconer published a political satire, a virulent rhyming tirade against Wilkes and Churchill, entitled *The Demagogue;* and in 1769 appeared his *Universal Marine Dictionary*, an elaborate and valuable work. While engaged on this dictionary, Mr. Murray, a bookseller in Fleet Street, father of Byron's munificent publisher and correspondent, wished him to join him as a partner in business. The poet declined the offer, probably because his dictionary was then near completion, and he might reasonably anticipate from its publication some favorable naval appointment. He did receive this reward; he was appointed purser of the "Aurora" frigate, which had been commissioned to carry out to India certain supervisors or superintendents of the East India Company. Besides his nomination as purser, Falconer was promised the post of private secretary to the commissioners. Before sailing he published a third edition of his *Shipwreck*, which had again undergone "correction," but not improvement. Mr. Stanier Clarke conceived that the poet, in his agitation and joy on being appointed to the "Aurora," had neglected this edition, and left the last alterations to his friend Mallet; but Mallet had then been more than four years in his grave, and Falconer, in the "advertisement" which he prefixed to the volume, and which is dated from Somerset House, October 1, 1769, said he had been encouraged by the favorable reception the poem had met with to give it "a strict and thorough revision." The day after this announcement the poet sailed in the "Aurora" from Spithead. The vessel arrived safely at the Cape of Good Hope, and having passed a fortnight there, left on the 27th of December. She was never more heard of, having, as is supposed, foundered at sea. The captain was a stranger to the navigation, and had obstinately persisted in proceeding by the Mozambique Channel instead of stretching as usual into the Indian Ocean south of Madagascar. Every commander of a vessel, as Fielding has remarked, claims absolute dominion in his little wooden world, and in too many instances shows the dangerous consequences of absolute power.

Thus miserably perished William Falconer in the thirty-seventh year of his age. His fame rests on his poem of *The Shipwreck*, and rests securely. In that work he did not aspire to produce a great effect by a few bold touches, or the rapid and masterly grouping of appalling or horrible circumstances. He labors in detail, bringing before us the events as they arise, and conducting us with an interest constantly increasing towards the catastrophe. Such a tremendous picture of shipwreck as that which Byron has, in wild sportiveness, thrown out in *Don Juan*, immeasurably transcends the powers of Falconer, and, indeed, stands alone in its terrible sublimity; but, on the other hand, the naval poet, by the truth and reality of his descriptions, ultimately impresses the mind of the reader, if not with such vivid force, perhaps with even more enduring effect. Some of the classic invocations to the shores of Greece, and some descriptive passages, are a little tawdry, but the grand incidents of the poem are never forgotten. The personification of the ship in its last struggles is sublime as well as affecting, and the reader's anxiety and sympathy with the principal characters and the hapless crew never slumber. Nor are the technical expressions and directions a drawback to the general reader. They are explained in footnotes, and give a truth and reality to the narrative; and they do not occur in the more impassioned scenes. (R. CA.)

FALCONET, ÉTIENNE MAURICE (1716–1791), a French sculptor, was born at Paris in 1716. His parents were poor, and he was at first apprenticed to a carpenter, but some of his clay-figures, with the making of which he occupied his leisure hours, having attracted the notice of Lemoine, that sculptor made him his pupil. While diligently prosecuting his profession he found time to study Greek and Latin, and also wrote several *brochures* on art, in which many names both ancient and modern of great reputation are treated in a remarkably disparaging way. His artistic productions are characterized by the same defects as his writings, for though manifesting considerable cleverness and some power of imagination, they display in many cases a false and fantastic taste, the result most probably of an excessive striving after originality. One of his most successful statues was one of Milo of Crotona, which secured his admission to the membership of the Academy of Fine Arts. Many of his works, being placed in churches, were destroyed at the time of the French Revolution. At the invitation of the empress Catherine he went to St. Petersburg, where he executed a colossal statue of Peter the Great in bronze. On his return to Paris in 1788 he became director of the French Academy of Painting. He died 4th January, 1791.

Among his writings are *Réflexions sur la sculpture* (Par. 1768), and *Observations sur la statue de Marc Aurèle* (Par. 1771). The whole were collected under the title of *Œuvres littéraires* (6 vols., Lausanne, 1781–82; 3 vols., Paris, 1787).

FALCONRY, the art of employing falcons and hawks in the chase,—a sport the practice of which is usually termed hawking. Falconry was for many ages of the Old World's history one of the principal sports. Probably it may be considered as having been always as purely a sport as it is at the present day; for even in the rudest times man must have been possessed of means and appliances for the capture of wild birds and beasts more effectual than the agency of hawks, notwithstanding the high state of efficiency to which, as we may still see, well-trained hawks may be brought. The antiquity of falconry is very great. It seems impossible to fix the exact period of its first appearance. There appears to be little doubt that it was practised in Asia at a very remote period, for which we have the concurrent testimony of various Chinese and Japanese works, some of the latter being most quaintly and yet spiritedly illustrated. It appears to have been known in China some 2000 years B.C., and the records of a King Wen Wang, who reigned over a province of that country 689 B.C., prove that the art was at that time in very high favor. In Japan it appears to have been known at least 600 years B.C., and probably at an equally early date in India, Arabia, Persia, and Syria. Sir A. H. Layard, as we learn from his work on *Nineveh and Babylon*, considers that in a bas-relief found by him in the ruins of Khorsabad "there appeared to be a alconer bearing a hawk on his wrist," from which it would ppear to have been known there some 1700 years B.C. In all the above-mentioned countries of Asia it is practised at the present day.

Little is known of the early history of falconry in Africa, but from very ancient Egyptian carvings and drawings it seems to have been known there many ages ago. It was probably also in vogue in the countries of Morocco, Oran, Algiers, Tunis, and Egypt, at the same time as in Europe. The older writers on falconry, English and Continental, often mention Barbary and Tunisian falcons. It is still practised in Africa; the present writer has visited two hawking establishments in Egypt.

Perhaps the oldest records of falconry in Europe are supplied by the writings of Pliny, Aristotle, and Martial. Although their notices of the sport are slight and somewhat vague, yet they are quite sufficient to show clearly that it was practised in their days—between the years 384 B.C. and 40 A.D. It was probably introduced into England from the Continent about 860 A.D., and from that time down to the middle of the 17th century falconry was followed with an ardor that perhaps no sport in our country has ever called forth, not even our grand national sport of fox-hunting. Stringent laws and enactments, notably in the reigns of William the Conqueror, Edward III., Henry VIII., and Elizabeth, were passed from time to time in its interest. Falcons and hawks were allotted to degrees and orders of men according to rank and station,—for instance, to royalty the jerfalcons, to an earl the peregrine, to a yeoman the goshawk, to a priest the sparrow-hawk, and to a knave or servant the useless kestrel. The writings of Shakespeare furnish ample testimony to the high and universal estimation in which it was held in his days. About the middle of the 17th century falconry began to decline in England, to revive somewhat at the Restoration. It never, however, completely recovered its former favor, a variety of causes operating against it, such as enclosure of waste lands, agricultural improvements, and the introduction of fire-arms into the sporting field, till it fell, as a national sport, almost into oblivion. Yet it has never been even temporarily extinct, and it is still very successfully practised at the present day.

In Europe the game or "quarry" at which hawks are flown consists of grouse (confined to the British Isles), blackgame, pheasants, partridges, quails, landrails, ducks, teal, woodcocks, snipes, herons, rooks, crows, gulls, magpies, jays, blackbirds, thrushes, larks, hares, and rabbits. In former days geese, cranes, kites, ravens, and bustards were also flown at. Old German works make much mention of the use of the Iceland falcon for taking the great bustard, a flight scarcely alluded to by English writers. In Asia the list of quarry is longer, and, in addition to all the foregoing, or their Asiatic representatives, various kinds of bustards, sand grouse, storks, ibises, spoonbills, pea-fowl, jungle-fowl, kites, vultures, and gazelles are captured by trained hawks. In Mongolia and Chinese Tartary, and among the nomad tribes of Central Asia, the sport still flourishes; and though some late accounts are not satisfactory either to the falconer or the naturalist, yet they leave no doubt that a species of eagle is still trained in those regions to take large game, as antelopes and wolves. Mr. Atkinson, in his account of his travels in the country of the Amoor, makes particular mention of the sport, as does also Mr. Shaw in his work on Yarkand; and in a letter from the Yarkand embassy, under Mr. Forsyth, C. B., dated Camp near Yarkand, Nov. 27, 1873, the following passage occurs:—"Hawking appears also to be a favorite amusement, the golden eagle taking the place of the falcon or hawk. This novel sport seemed very successful." It is questionable whether the bird here spoken of is the golden eagle. In Africa gazelles are taken, and also partridges and wildfowl.

The hawks used in England at the present time are the three great northern falcons, viz., the Greenland, Iceland, and Norway falcons, the peregrine falcon, the hobby, the merlin, the goshawk, and the sparrow-hawk. In former days the saker, the lanner, and the Barbary or Tunisian falcon were also employed. (See FALCON.)

Of the foregoing the easiest to keep, most efficient in the field, and most suitable for general use at the present day are the peregrine falcon and the goshawk.

In all hawks, the female is larger and more powerful than the male.

Hawks are divided by falconers all over the world into two great classes. The first class comprises "falcons," "long-winged hawks," or "hawks of the lure," distinguished by Eastern falconers as "dark-eyed hawks." In these the wings are pointed, the second feather in the wing is the longest, and the irides are dark-brown. Merlins must, however, be excepted; and here it would seem that the Eastern distinction is the best, for though merlins are much more falcons than they are hawks, they differ from falcons in having the third feather in the wing the longest, while they are certainly "dark-eyed hawks."

The second class is that of "hawks," "short-winged hawks," or "hawks of the fist," called by Eastern falconers "yellow (or rose) eyed hawks." In these the wings are rounded, the fourth feather is the longest in the wing, and the irides are yellow, orange, or deep-orange.

The following glossary of the principal terms used in falconry may, with the accompanying woodcut, assist the reader in perusing this notice of the practice of the art. Useless or obsolete terms are omitted:—

Bate.—A hawk is said to "bate" when she flutters off from the fist, perch or block, whether from wildness, or for exercise, or in the attempt to chase.

Bewits.—Straps of leather by which the bells are fastened to a hawk's legs.

Bind.—A hawk is said to "bind" when she seizes a bird in the air and clings to it. This term is properly only applied to the seizure of large quarry, taken at a height in the air.

Block.—The conical piece of wood, of the form of an inverted flower-pot, used for hawks to sit upon; for a peregrine it should be about 10 to 12 inches high, 5 to 6 in diameter at top and 8 to 9 in diameter at base.

Brail.—A thong of soft leather used to secure, when desirable, the wing of a hawk. It has a slit to admit the pinion joint, and the ends are tied together.

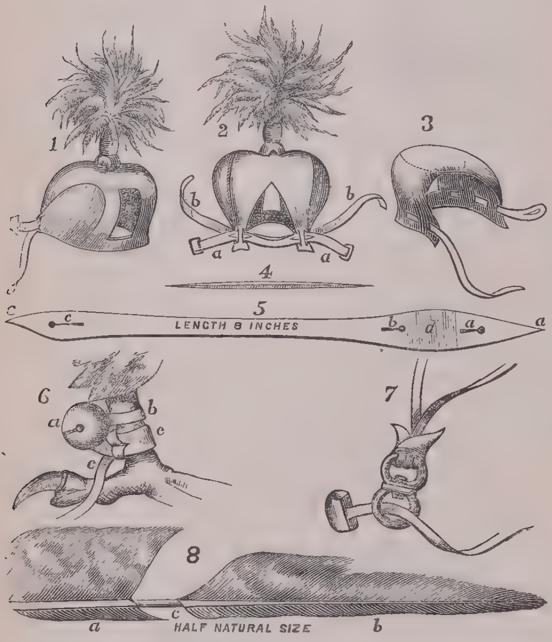
Cadge.—The wooden frame on which hawks, when numerous, are carried to the field.

Cadger.—The person who carries the cadge.

Calling off.—Luring a hawk (see *Lure*) from the hand of an assistant at a distance for training or exercise is called "calling off."

Carry.—A hawk is said to "carry" when she flies away with the quarry on the approach of the falconer.

Cast.—Two hawks which may be used for flying together are called a "cast."



Implements used in Falconry.

1. Hood; 2. Back view of hood, showing braces, *a*, *a*, *b*, *b*; by drawing the braces *b*, *b*, the hood, now open, is closed; 3. Rufter hood; 4. Imping-needle; 5. Jess; *d* is the space for the hawk's leg; the point and slit *a*, *a*, are brought round the leg and passed through slit *b*, after which the point *c* and slit *c*, and also the whole remaining length of jess, are pulled through slits *a* and *b*; *c* is the slit to which the upper ring of swivel is attached; 6. Hawk's leg with bell *a*, bewit *b*, jess *c*; 7. Jesses, swivel and leash; 8. Portion of first wing-feather of male peregrine falcon, "tiercel," half natural size in process of imping; *a*, the living hawk's feather; *b*, piece supplied from another tiercel, with the imping-needle *c* pushed half its length into it and ready to be pushed home into the living bird's feather.

Casting.—The oblong or egg-shaped ball, consisting of feathers, bones, etc., which all hawks (and insectivorous birds) throw up after the nutritious part of their food has been digested.

Cere.—The naked wax-like skin above the beak.

Check.—A hawk is said to fly at "check" when she flies at a bird other than the intended object of pursuit,—for instance, if a hawk slipped at a heron goes off at a rook, she flies at check.

Clutching.—Taking the quarry in the feet as the short-winged hawks do. Falcons occasionally "clutch."

Come to.—A hawk is said to "come to" when she begins to get tame.

Coping.—Cutting the beak or talons of a hawk is called "coping."

Crabbing.—Hawks are said to "crab" when they seize one another fighting.

Creance.—A long line or string.

Crop, to put away.—A hawk is said to "put away her crop" when the food passes out of the crop into the stomach.

Deck-feathers.—The two centre tail-feathers.

Eyas.—A hawk which has been brought up from the nest is an "eyas."

Eyry.—The nest of a hawk.

Foot.—A hawk is said to "foot" well or to be a "good footer" when she is successful in killing. Many hawks are very fine flyers without being "good footers."

Frounce.—A disease in the mouth and throat of hawks.

Get in.—To go up to a hawk when she has killed her quarry is to "get in."

Hack.—The state of partial liberty in which young hawks must always at first be kept—loose to fly about where they like, but punctually fed early in the morning and again in the day, to keep them from seeking food for themselves as long as possible.

Haggard.—A wild-caught hawk in the adult plumage.

Hood.—The cap of leather used for the purpose of blindfolding the hawk. (See woodcut.)

Hoodshy.—A hawk is said to be "hoodshy" when she is afraid of, or resists, having her hood put on.

Imping.—The process of mending broken feathers is called "imping." (See 8 in cut.)

Imping-needle.—A piece of tough soft iron wire from about 1½ to 2½ inches long, rough filed so as to be three-sided and tapering from the middle to the ends. (See 4 in cut.)

Intermewed.—A hawk moulted in confinement is said to be "intermewed."

Jesses.—Strips of light but very tough leather, some 6 to 8 inches long, which always remain on a hawk's legs—one on each leg. (See cut.)

Leash.—A strong leathern thong, some 2½ or 3 feet long, with a knot or button at one end. (See 7 in cut.)

Lure.—The instrument used for calling long-winged hawks,—a dead pigeon, or an artificial lure made of leather and feathers or wings of birds, tied to a string.

Man a hawk.—To tame a hawk and accustom her to strangers.

Mantle.—A hawk is said to "mantle" when she stretches out a leg and a wing simultaneously, a common action of hawks when at ease; also when she spreads out her wings and feathers to hide any quarry or food she may have seized from another hawk, or from man. In the last case it is a fault.

Make hawk.—A hawk is called a "make hawk" when, as a thoroughly trained and steady hawk, she is flown with young ones to teach them their work.

Mew.—A hawk is said to "mew" when she moults. The place where a hawk was kept to moult was in olden times called her "mew." Buildings where establishments of hawks were kept were called "mews"—an appellation which in many cases they have retained to this day.

Pannel.—The stomach of a hawk, corresponding with the gizzard of a fowl, is called her pannel. In it the casting is formed.

Passage.—The line herons take over a tract of country on their way to and from the heronry when procuring food in the breeding season is called a "passage."

Passage hawks.—Are hawks captured when on their passage or migration. This passage takes place twice a year, in spring and autumn.

Pelt.—The dead body of any quarry the hawk has killed.

Pitch.—The height to which a hawk, when waiting for game to be flushed, rises in the air is called her "pitch."

Plume.—A hawk is said to "plume" a bird when she pulls off the feathers.

Point.—A hawk "makes her point" when she rises in the air in a peculiar manner over the spot where quarry has saved itself from capture by dashing into a hedge, or has otherwise secreted itself.

Pull through the hood.—A hawk is said to pull through the hood when she eats with it on.

Put in.—A bird is said to "put in" when it saves itself from the hawk by dashing into covert or other place of security.

Quarry.—The bird or beast flown at.

Rake out.—A hawk is said to "rake out" when she flies, while "waiting on" (see *Wait on*), too far and wide from her master.

Red hawk.—Hawks of the first year, in the young plumage, are called "red hawks."

Ringing.—A bird is said to "ring" when it rises spirally in the air.

Rufter hood.—An easy fitting hood, not, however, convenient for hooding and unhooding—used only for hawks when first captured (see 3 in cut).

Seeling.—Closing the eyes by a fine thread drawn through the lid of each eye, the threads being then twisted together above the head,—a practice long disused in England.

Serving a hawk.—Driving out quarry which has taken refuge, or has "put in."

Take the air.—A bird is said to "take the air" when it seeks to escape by trying to rise higher than the falcon.

Tiercel.—The male of various falcons, particularly of the peregrine, is called a "tiercel;" the term is also applied to the male of the goshawk.

Trussing.—A hawk is said to "truss" a bird when she catches it in the air, and comes to the ground with it in her talons; this term is not applied to large quarry. (See *Bind.*)

Varvels.—Small rings, generally of silver, fastened to the end of the jesses—not much used now.

Wait on.—A hawk is said to "wait on" when she flies above her master waiting till game is sprung.

Weathering.—Hawks are "weathered" by being placed unhooded in the open air. This term is applied to passage hawks which are not sufficiently reclaimed to be left out by themselves unhooded on blocks,—they are "weathered" by being put out for an hour or two under the falconer's eye.

Yarak.—An Eastern term, generally applied to short-winged hawks. When a hawk is keen, and in hunting condition, she is said to be "in yarak."

The training of hawks affords much scope for judgment, experience, and skill on the part of the falconer, who must carefully observe the temper and disposition as well as the constitution of each bird; and various practices are resorted to which cannot be here described. It is through the appetite principally that hawks, like most wild animals, are tamed; but to fit them for use in the field much patience, gentleness, and care must be used. Slovenly taming necessitates starving, and low condition and weakness are the result. The aim of the falconer must be to have his hawks always keen, and the appetite when they are brought into the field should be such as would induce the bird in a state of nature to put forth its full powers to obtain its food, with, as near as possible, a corresponding condition as to flesh. The following is an outline of the process of training hawks, beginning with the management of a wild-caught peregrine falcon. When first taken, a rufter hood should be put on her head, and she must be furnished with jesses, swivel, leash, and bell. A thick glove or rather gauntlet must be worn on the left hand (Eastern falconers always carry a hawk on the right), and she must be carried about as much as possible, late into the night, every day, being constantly stroked with a bird's wing or feather, very lightly at first. At night she should be tied to a perch in a room with the window darkened, so that no light can enter in the morning. The perch should be a padded pole placed across the room, about four and a half feet from the ground, with a canvas screen underneath. She will easily be induced to feed in most cases by drawing a piece of beefsteak over her feet, brushing her legs at the time with a wing, and now and then, as she snaps, slipping a morsel into her mouth. Care must be taken to make a peculiar sound with the lips or tongue, or to use a low whistle as she is in the act of swallowing; she will very soon learn to associate this sound with feeding, and it will be found that directly she hears it, she will gripe with her talons, and bend down to feel for food. When the falconer perceives this and other signs of her "coming to," that she no longer starts at the voice or touch, and steps quietly up from the perch when the hand is placed under her feet, it will be time to change her rufter hood for the ordinary hood. This latter should be very carefully chosen,—an easy fitting one, in which the braces draw closely and yet easily and without jerking. An old one previously worn is to be recommended. The hawk should be taken into a very dark room,—one absolutely dark is best,—and the change should be made if possible in total darkness. After this she must be brought to feed with her hood off; at first she must be fed every day in a darkened room, a gleam of light being admitted. The first day, the hawk having seized the food, and begun to pull at it freely, the hood must be gently slipped off, and after she has eaten a moderate quantity, it must be replaced as slowly and gently as possible, and she should be allowed to finish her meal through the hood. Next day the hood may be twice removed, and so on; day by day the practice should be continued, and more light gradually admitted, until the hawk will feed freely in broad daylight, and suffer the hood to be taken off and replaced without opposition. Next she must be accustomed to see and feed in the presence of strangers and dogs, etc. A good plan is to carry her in the streets of a town at night, at first where the gaslight is not strong, and where persons passing by are few, unhooding and hooding her from time to time, but not letting her get frightened. Up to this time she should be fed on lean beefsteak with no castings, but as soon as she is tolerably tame and submits well to the hood, she must occasionally be fed with pigeons and other birds. This should be done not later than 3 or 4 P.M., and when she is placed on her perch for the night in the dark room, she must be unhooded and left so, of course being carefully tied up. The falconer should enter the room about 7 or 8 A.M. next day, admitting as little light as possible, or using a candle. He should first observe if she has thrown her casting; if so, he will at once take her to the fist, giving her a bite of food, and re-hood her. If her casting is not thrown it is better for him to retire, leaving the room quite dark, and come in again later. She must now be taught to know the voice,—the shout that is used to call her in the field, and to jump to the fist for food, the voice being used every time she is fed. When she comes freely to the fist she must be made acquainted with the lure. Kneeling down with the hawk on his fist, and gently unhooding her, the falconer casts out a lure, which may be either a dead pigeon or an artificial lure garnished with beefsteak tied to a string, to a distance of a couple or three feet in front of her. When she jumps down to it, she should be suffered to eat a little on it—the voice being used—the while receiving morsels from the falconer's hand; and before her meal is finished she must be taken off to the hand, being induced to forsake the lure for the hand by a tempting piece of meat. This treatment will help to check her inclination hereafter to carry her quarry. This lesson is to be continued till the falcon feeds very boldly on the lure on the ground, in the falconer's presence—till she will suffer him to walk round her while she is feeding. All this time she will have been held by the leash only, but in the next step a strong but light creance must be made fast to the leash, and an assistant holding the hawk should unhood her, as the falconer, standing at a distance of 5 to 10 yards, calls her by shouting and casting out the lure. Gradually day after day the distance is increased, till the hawk will come 30 yards or so without hesitation; then she may be trusted to fly to the lure at liberty, and by degrees from any distance, say 1000 yards. This accomplished, she should learn to stoop at the lure. Instead of allowing the hawk to seize upon it as she comes up, the falconer should snatch the lure away and let her pass by, and immediately put it out that she may readily seize it when she turns round to look for it. This should be done at first only once, and then progressively until she will stoop backwards and forwards at the lure as often as desired. Next she should be entered at her quarry. Should she be intended for rooks or herons, two or three of these birds should be procured. One should be given her from the hand, then one should be released close to her, and a third at a considerable distance. If she take these keenly, she may be flown at a wild bird. Care must, however, be taken to let her have every possible advantage in her first flights,—wind and weather, and the position of the quarry with regard to the surrounding country, must be considered.

Young hawks, on being received by the falconer before they can fly, must be put into a sheltered place, such as an outhouse or shed. The basket or hamper should be filled with straw. A hamper is best, with the lid so placed as to form a platform for the young hawks to come out upon to feed. This should be fastened to a beam or prop a few feet from the ground. The young hawks must be most plentifully fed on the best fresh food obtainable—good beefsteak and fresh-killed birds; the falconer when feeding them should use his voice as in luring. As they grow old enough they will come out, and perch about the roof of their shed, by degrees extending their flights to neighboring buildings or trees, never failing to come at feeding-time to the place where they are fed. Soon they will be continually on the wing, playing or fighting with one another, and later the falconer will observe them chasing other birds, as pigeons and rooks, which may be passing by. As soon as one fails to come for a meal, it must be at once caught with a bow net or a snare the first time it comes back, or it will be lost. It must be borne in mind that the longer hawks can be left at hack the better they are likely to be for use in the field,—those hawks being always the best which have preyed a few times for themselves before being caught. Of course there is great risk of losing hawks when they begin to prey for themselves. When a hawk is so caught, she is said to be "taken up" from hack. She will not require a rufter hood, but a good deal of the management described for the passage falcon will be necessary. She must be carefully tamed and broken to the hood in the same manner, and so taught to know the lure; but, as might be expected, very much less difficulty will be experienced. As soon as the eyas knows the lure sufficiently well to come to it sharp and straight from a distance, she must be taught to "wait on." This is effected by letting the hawk loose in an open place, such as a down. It will be found that she will circle round the falconer looking for the lure she has been accustomed to see,—perhaps mount a little in the air, and advantage must be taken of a favorable moment when the hawk is at a little height, her head being turned in towards the falconer, to let go a pigeon which she can easily catch. When the hawk has taken two or three pigeons in this way, and mounts immediately in expectation, in short, begins to wait on, she should see no more pigeons, but be tried at game as soon as possible. Young peregrines should be flown at grouse first in preference to partridges, not only because the season commences earlier, but because, grouse being the heavier birds, they are not so much tempted to "carry" as with partridges.

The training of the great northern falcons, as well as that of merlins and hobbies, is conducted much on the above principles, but the jerfalcons will seldom wait on well, and merlins will not do it at all.

The training of short-winged hawks is a simpler process. They must, like falcons, be provided with jesses, swivel, leash, and bell. In these hawks a bell is sometimes fastened to the tail. Sparrow-hawks can, however, scarcely carry a bell big enough to be of any service. The hood is seldom used for short-winged hawks,—never in the field. They must be made as tame as possible by carriage on the fist and the society of man, and taught to come to the fist freely when required,—at first to jump to it in a room, and then out of doors. When the goshawk comes freely and without hesitation from short distances, she ought to be called from long distances from the hand of an assistant, but not oftener than twice in each meal, until she will come at least 1000 yards, on each occasion being well rewarded with some food she likes very much, as a fresh-killed bird, warm. When she does this freely, and endures the presence of strangers, dogs, etc., a few bagged rabbits should be given to her, and she will be ready to take the field. Some accustom the goshawk to the use of the lure, for the purpose of taking her if she will not come to the fist in the field when she has taken stand in a tree after being baulked of her quarry, but it ought not to be necessary to use it.

Falcons or long-winged hawks are either "flown out of the hood," *i. e.*, unhooded and slipped when the quarry is in sight, or they are made to "wait on" till game is flushed. Herons and rooks are always taken by the former method. Passage hawks are generally employed for flying at these birds, though we have known some good eyases quite equal to the work. For heron-hawking a well-stocked heronry is in the first place necessary. Next an open country which can be ridden over—over which herons are in the constant habit of passing to and from their heronry on their fishing excursions, or making their "passage." A heron found at his feeding place at a brook or pond affords no sport whatever. If there be little water any peregrine falcon that will go straight at him will seize him soon after he rises. It is sometimes advisable to fly a young falcon at a heron so found, but it should not be repeated. If there be much water the heron will neither show sport nor be captured. It is quite a different affair when he is sighted winging his way at a height in the air over an open tract of country free from water. Though he has no chance whatever of competing with a falcon in straightforward flight, the heron has large concave wings, a very light body proportionately, and air-cells in his bones, and can rise with astonishing rapidity, more perpendicularly, or, in other words, in smaller rings, than the falcon can, with very little effort. As soon as he sees the approach of the falcon, which he usually does almost directly she is cast off, he makes play for the upper regions. Then the falcon commences to climb too to get above him, but in a very different style. She makes very large circles or rings, travelling at a high rate of speed, due to her strength and weight and power of flying, till she rises above the heron. Then she makes her attack by stooping with great force at the quarry, sometimes falling so far below it as the blow is evaded that she cannot spring up to the proper pitch for the next stoop, and has to make another ring to regain her lost command over the heron, which is ever rising, and so on,—the "field" meanwhile galloping down wind in the direction the flight is taking till she seizes the heron aloft, "binds" to him, and both come down together. Absurd stories have been told and pictures drawn of the heron receiving the falcon on its beak in the air. It is, however, well known to all practical falconers that the heron has no power or inclination to fight with a falcon in the air; so long as he is flying he seeks safety solely from his wings. When on the ground, however, should the falcon be deficient in skill or strength, or have been mutilated by the coping of her beak and talons, as was sometimes formerly done in Holland with a view to saving the heron's life, the heron may use his dagger-like bill with dangerous effect, though it is very rare for a falcon to be injured. It is never safe to fly the goshawk at a heron of any description. Short-winged hawks do not immediately kill their quarry as falcons do, nor do they seem to know where the life lies, and seldom shift their hold once taken even to defend themselves; and they are therefore easily stabbed by a heron. Rooks are flown in the same manner as herons, but the flight is generally inferior. Although rooks fly very well, they seek shelter in trees as soon as possible.

For game-hawking eyases are generally used, though undoubtedly passage or wild-caught hawks are to be preferred. The best game hawks we have seen have been passage hawks, but there are difficulties attending the use of them. It may perhaps be fairly said that it is easy to make all passage hawks "wait on" in grand style, but until they have got over a season or two they are very liable to be lost. Among the advantages attending the use of eyases are the following:—they are easier to obtain and to train and keep; they also moult far better and quicker than passage hawks, while if lost in the field, they will often go home by themselves, or remain about the spot where they were liberated. Experience, and, we must add, some good fortune also, are requisite to make eyases good for waiting on for game. Slight mistakes on the part of the falconer, false points from dogs, or bad luck in serving, will cause a young hawk to acquire bad habits, such as sitting down on the ground, taking stand in a tree, raking out wide, skimming the ground, or lazily flying about at no height. A good game hawk in proper flying order goes up at once to a good pitch in the air—the higher she flies the better—and follows her master from field to field, always ready for a stoop when the quarry is sprung. Hawks that have been successfully broken and judiciously worked become wonderfully clever, and soon learn to regulate their flight by the movements of their master. Eyases were not held in esteem by the old falconers, and it is evident from their writings that these hawks have been very much better understood and managed in the nineteenth century than in the Middle Ages. It is probable that the old falconers procured their passage and wild-caught hawks with such facility, having at the same time more scope for their use in days when quarry was more abundant and there was more waste land than we have now, that they did not find it necessary to trouble themselves about eyases. We here quote a few lines from one of the best of the old writers, which may be taken as giving a fair account of the estimation in which eyases were generally held, and from which it is evident that the old falconers did not understand flying hawks at hack. Simon Latham, writing in 1633, says of eyases:—

> They will be verie easily brought to familiaritie with the man not in the house only, but also abroad, hooded or unhooded, nay, many of them will be more gentle and quiet when unhooded than when hooded, for if a man doe but stirre or speake in their hearing, they will crie and bate as though they did desire to see the man. Likewise some of them being unhooded, when they see the man will cowre and crie, shewing thereby their exceeding fondness and fawning love towards him. . . . . . . These kind of hawks be all (for the most part) taken out of the nest while verie young, even in the downe, from whence they are put into a close house, whereas they be alwaies fed and familiarly brought up by the man, untill they bee able to flie, when as the summer approaching verie suddenly they are continued and trained up in the same, the weather being alwaies warm and temperate; thus they are still inured to familiaritie with the man, not knowing from whence besides to fetch their relief or sustenance. When the summer is ended they bee commonly put up into a house again, or else kept in

> some warm place, for they cannot endure the cold wind to blow upon them. . . . But leaving to speak of these kind of scratching hawks that I never did love should come too neere my fingers, and to return unto the faire conditioned haggard faulcon. . . .

The author here describes with accuracy the condition of unhacked eyases, which no modern falconer would trouble himself to keep. Many of our falconers in this century have had eyases which have killed grouse, ducks, and other quarry in a style almost equalling that of passage hawks. Rooks also have been most successfully flown, and some herons on passage have been taken by eyases. No sport is to be had at game without hawks that wait on well. Moors, downs, open country where the hedges are low and weak, are best suited to game hawking. Pointers or setters may be used to find game, or the hawk may be let go on coming to the ground where game is known to lie, and suffered, if an experienced one, to "wait on" till game is flushed. However, the best plan with most hawks, young ones especially, is to use a dog, and to let the hawk go when the dog points, and to flush the birds as soon as the hawk is at her pitch. It is not by any means necessary that the hawk should be near the birds when they rise, provided she is at a good height, and that she is watching; she will come at once with a rush out of the air at great speed, and either cut one down with the stoop, or the bird will save itself by putting in, when every exertion must be made, especially if the hawk be young and inexperienced, to "serve" her as soon as possible by driving out the bird again while she waits overhead. If this be successfully done she is nearly certain to kill it at the second flight. Perhaps falcons are best for grouse and tiercels for partridges.

Magpies afford much sport. Only tiercels should be used for hunting magpies. A field is necessary—at the very least 4 or 5 runners to beat the magpie out, and perhaps the presence of a horseman is an advantage. Of course in open flight a magpie would be almost immediately caught by a tiercel peregrine, and there would be no sport, but the magpie makes up for his want of power of wing by his cunning and shiftiness; and he is, moreover, never to be found except where he has shelter under his lee for security from a passing peregrine. Once in a hedge or tree he is perfectly safe from the wild falcon, but the case is otherwise when the falconer approaches with his trained tiercel, perhaps a cast of tiercels, waiting on in the air, with some active runners in his field. Then driven from hedge to hedge, from one kind of shelter to another, stooped at every instant when he shows himself ever so little away from cover by the watchful tiercels overhead, his egg-stealing days are brought to an end by a fatal stroke—sometimes not before the field are pretty well exhausted with running and shouting. The magpie always manœuvres towards some thick wood, from which it is the aim of the field to cut him off. At first hawks must be flown in easy country, but when they understand their work well they will kill magpies in every enclosed country,—with a smart active field a magpie may even be pushed through a small wood. Magpie hawking affords excellent exercise, not only for those who run to serve the hawks, but for the hawks also; they get a great deal of flying, and learn to hunt in company with men,—any number of people may be present. Blackbirds may be hunted with tiercels in the same way. Woodcocks afford capital sport where the country is tolerably open. It will generally be found that after a hawk has made one stoop at a woodcock, the cock will at first try to escape by taking the air, and will show a very fine flight. When beaten in the air it will try to get back to covert again, but when once a hawk has outflown a woodcock, he is pretty sure to kill it. Hawks seem to pursue woodcocks with great keenness; something in the flight of the cock tempts them to exertion. The laziest and most useless hawks—hawks that will scarcely follow a slow pigeon—will do their best at woodcock, and will very soon, if the sport is continued, be improved in their style of flying. Snipes may be killed by first-class tiercels in favorable localities. Wild ducks and teal are only to be flown at when they can be found in small pools or brooks at a distance from much water,—where the fowl can be suddenly flushed by men or dogs while the falcon is flying at her pitch overhead. For ducks, falcons should be used; tiercels will kill teal well.

The merlin is used for flying at larks, and there does not seem to be any other use to which this pretty little falcon may fairly be put. It is very active, but far from being, as some authors have stated, the swiftest of all hawks. Its flight is greatly inferior in speed and power to that of the peregrine. Perhaps its diminutive size, causing it to be soon lost to view, and a limited acquaintance with the flight of the wild peregrine falcon, have led to the mistake.

The hobby is far swifter than the merlin, but cannot be said to be efficient in the field; it may be trained to wait on beautifully, and will sometimes take larks; it is very much given to the fault of "carrying."

The three great northern falcons are not easy to procure in proper condition for training. They are very difficult to break to the hood and to manage in the field. They are flown, like the peregrine, at herons and rooks, and in former days were used for kites and hares. Their style of flight is magnificent; they are considerably swifter than the peregrine, and are most deadly "footers." They seem, however, to lack somewhat of the spirit and dash of the peregrine.

For the short-winged hawks an open country is not required; indeed they may be flown in a wood. Goshawks are flown at hares, rabbits, pheasants, partridges, and wildfowl. Only very strong females are able to take hares; rabbits are easy quarry for any female goshawk, and a little too strong for the male. A good female goshawk may kill from 10 to 15 rabbits in a day, or more. For pheasants the male is to be preferred, certainly for partridges; either sex will take ducks and teal, but the falconer must get close to them before they are flushed, or the goshawk will stand a poor chance of killing. Rabbit hawking may be practised by ferreting, and flying the hawk as the rabbits bolt, but care must be taken or the hawk will kill the ferret. Where rabbits sit out on grass or in turnip fields, a goshawk may be used with success, even in a wood when the holes are not too near. From various causes it is impossible, or nearly so, to have goshawks in England in the perfection to which they are brought in the East. In India, for instance, there is a far greater variety of quarry suited to them, and wild birds are much more approachable; moreover, there are advantages for training which we do not possess in England. Unmolested,—and scarcely noticed except perhaps by others of his calling or tastes,—the Eastern falconer carries his hawk by day and night in the crowded bazaars, till the bird becomes perfectly indifferent to men, horses, dogs, carriages, and, in short, becomes as tame as the domestic animals.

The management of sparrow-hawks is much the same as that of goshawks, but they are far more delicate than the latter. They are flown in England at blackbirds, thrushes, and other small birds; good ones will take partridges well till the birds get too wild and strong with the advancing season. In the East large numbers of quails are taken with sparrow-hawks.

It is of course important that hawks from which work in the field is expected should be kept in the highest health, and they must be carefully fed; no bad or tainted meat must on any account be given to them,—at any rate to hawks of the species now used in England. Peregrines and the great northern falcons are best kept on beefsteak, with a frequent change in the shape of fresh-killed pigeons and other birds. The smaller falcons, the merlin and the hobby, require a great number of small birds to keep them in good health for any length of time. Goshawks should be fed like peregrines, but rats and rabbits are very good as change of food for them. The sparrow-hawk, like the small falcons, requires small birds. All hawks require castings frequently. It is true that hawks will exist, and often appear to thrive, on good food without castings, but the seeds of probable injury to their health are being sown the whole time they are so kept. If there is difficulty in procuring birds, and it is more convenient to feed the hawks on beefsteak, they should frequently get the wings and heads and necks of game and poultry. In addition to the castings which they swallow, tearing these is good exercise for them, and biting the bones prevents the beaks from overgrowing. Most hawks, peregrines especially, require the bath. The end of a cask, sawn off to give a depth of about 6 inches, makes a very good bath. Peregrines which are used for waiting on require a bath at least twice a week. If this be neglected, they will not wait long before going off in search of water to bathe, however hungry they may be.

The most agreeable and the best way, where practicable, of keeping hawks is to have them on blocks on the lawn. Each hawk's block should stand in a circular bed of sand —about 8 feet in diameter; this will be found very convenient for keeping them clean. Goshawks are generally placed on low perches, which ought not to be more than 8 or 9 inches high at the highest part of the arc. It will be several months before passage or wild-caught falcons can be kept out of doors; they must be fastened to a perch in a darkened room, hooded, but by degrees as they get thoroughly tame may be brought to sit on the lawn. In England (especially in the south) peregrines, the northern falcons, and goshawks may be kept out of doors all day and night in a sheltered situation. In very wild boisterous weather, or in snow or sharp frost, it will be advisable to move them to the shelter of a shed, the floor of which should be laid with sand to a depth of 3 or 4 inches. Merlins and hobbies are too tender to be kept much out of doors. An eastern aspect is to be preferred,—all birds enjoy the morning sun, and it is very beneficial to them. The more hawks confined to blocks out of doors see of persons, dogs, horses, etc., moving about the better, but of course only when there is no danger of their being frightened or molested, or of food being given to them by strangers. Those who have only seen wretched ill-fed hawks in cages as in zoological gardens or menageries, pining for exercise, with battered plumage, torn shoulders, and bleeding ceres from dashing against their prison bars, and overgrown beaks from never getting bones to break, can have little idea of the beautiful and striking-looking birds to be seen pluming their feathers and stretching their wings at their ease at their blocks on the falconer's lawn, watching with their large bright keen eyes everything that moves in the sky, and everywhere else within the limits of their view. Contrary to the prevailing notion, hawks show a good deal of attachment when they have been properly handled. It is true that by hunger they are in a great measure tamed and controlled, and the same may be said of all undomesticated and many domesticated animals. And instinct prompts all wild creatures when away from man's control to return to their former shyness, but hawks certainly retain their tameness for a long time, and their memory is remarkably retentive. Wild-caught hawks have been re-taken, either by their coming to the lure or upon quarry, from 2 to 7 days after they had been lost, and eyases after 3 weeks. As one instance of retentiveness of memory displayed by hawks we may mention the case of a wild-caught falcon which was re-captured after being at liberty more than 3 years, still bearing the jesses which were cut short close to the leg at the time she was released; in five days she was flying at the lure again at liberty, and was found to retain the peculiar ways and habits she was observed to have in her former existence as a trained hawk. It is useless to bring a hawk into the field unless she has a keen appetite; if she has not, she will neither hunt effectually nor follow her master. Even wild-caught falcons, however, may sometimes be seen so attached to their owner that, when sitting on their blocks on a lawn with food in their crops, they will on his coming out of the house bate hard to get to him, till he either go up to them and allow them to jump up to his hand or withdraw from their sight. Goshawks are also known to evince attachment to their owner. Another prevailing error regarding hawks is that they are supposed to be lazy birds, requiring the stimulus of hunger to stir them to action. The reverse is the truth; they are birds of very active habits, and exceedingly restless, and the notion of their being lazy has been propagated by those who have seen little or nothing of hawks in their wild state. The wild falcon requires an immense deal of exercise, and to be in wind, to exert the speed and power of flight necessary to capture her prey when hungry; and to this end instinct prompts her to spend hours daily on the wing, soaring and playing about in the air in all weathers, often chasing birds merely for play or exercise. Sometimes she takes a siesta when much gorged, but unless she fills her crop late in the evening she is soon moving again—before half her crop is put over. Goshawks and sparrow-hawks too, habitually soar in the air at about 9 or 10 A.M., and remain aloft a considerable time, but these birds are not of such active habits as the falcons. The frequent bating of thoroughly tame hawks from their blocks, even when not hungry or frightened, proves their restlessness and impatience of repose. So does the wretched condition of the caged falcon (before alluded to), while the really lazy buzzards and kites, which do not in a wild state depend on activity or power of wing for their sustenance, maintain themselves in confinement, if properly fed, for years in good case and plumage. Such being the habits of the falcon in a state of nature, the falconer should endeavor to give the hawks under his care as much flying as possible, and he should avoid the very common mistake of keeping too many hawks. In this case a favored few are sure to get all the work, and the others, possibly equally good if they had fair play, are spoiled for want of exercise.

The larger hawks may be kept in health and working order for several years—15 or 20—barring accidents. The writer has known peregrines, shaheens, and goshawks to reach ages between 15 and 20 years. Goshawks, however, never fly well after 4 or 5 seasons, when they will no longer take difficult quarry; they may be used at rabbits as long as they live. Shaheens may be seen in the East at an advanced age, killing wild-fowl beautifully. The shaheen is a falcon of the peregrine type, which does not travel, like the peregrine, all over the world. It appears that the jerfalcons also may be worked to a good age. Old Simon Latham tells us of these birds,—"I myself have known one of them an excellent Hearnor, and to continue her goodnesse very near twentie yeeres, or full out that time."

It is hardly likely that falconry will ever recover such a position as to be reckoned once more among the national sports of England. Yet in these days of breech-loading and battue shooting, when even a well-broken retriever is a rarity, from want of time to see him work or to give him fair play, there are still some sportsmen who are, to quote the words of the authors of our best modern book on falconry, in the dedication of their work, "those who love sport for its own sake, and in the pursuit of it are willing to tread in the footsteps of their forefathers."

The work just quoted is *Falconry in the British Isles*, by Salvin and Brodrick. A work to which we are very largely indebted for information regarding the past history of falconry and its practice in foreign countries is Schlegel's *Traité de Fauconnerie*. This magnificent book, in the words of a very able writer in the *Quarterly Review* for July, 1875, "is a worthy monument of the noble art it describes; the extent and minuteness of the learned author's antiquarian resources are only equalled by his practical knowledge of the details of modern usage, and the result is such as may be expected from such a combination." It contains a very large list of works on falconry in languages of all the principal countries of the Old World. Other modern works are *Practical Falconry*, by the Rev. G. E. Freeman, an excellent little book; *Falconry, its Claims, History, and Practice*, by Freeman and Salvin; *Observations on Hawking*, by Sir J. S. Sebright, Bart.; and a pamphlet entitled *Notes on the Falconidæ used in India in Falconry*, by Lieutenant-Colonel Delmé Radcliffe. Perhaps the most useful of the old works are *The Booke of Faulconrie or Hawking*, by George Turberville, 1575, and *The Faulcon's Lure and Cure*, by Simon Latham, 1633. (E. D. R.)

FALERII, an ancient and powerful city of Etruria, the capital of the Falisci, who occupied the region between Soracte and Monte Cimino. The affinity of the Falisci with the Etrurians is both asserted and denied; in historic times Falerii at least appears as a city of Etrurian sympathies, and it probably belonged to the Etrurian League. It supported the people of Veii against the Romans, and used its utmost efforts to rouse the other Etrurians against the common foe. After the reduction of Veii the Faliscans saw themselves exposed to the fury of the Roman arms, and after a siege from Camillus they were obliged to surrender their city. The episode of the traitor schoolmaster and the generosity of the Roman commander needs only be mentioned to be generally remembered. From this time Falerii continued sometimes at peace, sometimes at war with Rome, till on the conclusion of the first Punic war it rose in open rebellion; after a short resistance it was taken and destroyed, and its inhabitants were forced to select a site for a new city in a less inaccessible and defensible position. The Falerii thus founded was enrolled in the Horatian tribe, and under the triumvirs received a military colony. The old city continued, probably from its religious associations, to retain a small population, and this in all likelihood explains the fact that Strabo speaks of two towns, one Falerii and the other Faliscum. Ovid in his *Amores* relates how he ascended by a toilsome path to the temple of the Faliscan Juno, a goddess, who, according to inscriptions, bore the title of Quuris (or "of the spear"), and, if we may trust the tradition, had young girls immolated on her altar. In the Middle Ages the inhabitants of the Roman town, invited by the impregnable position of the earlier site, returned and built the town now known as Civita Castellana. The ruins they left behind them are now occupied by the small hamlet of Santa Maria di Falleri. They consist mainly of the city walls, which stand from 35 to 55 feet high, and are of excellent architecture and strengthened by square towers. Within the ancient area are the remains of a convent in the Lombard style, and we learn from a bull of Benedict IX. that the town continued a separate see from Castellana till 1033.

Excavations made at Santa Maria di Falleri by Angelo Jannoni Sebastiani are reported in the *Annales dell Inst. di Cor. Arch. di Roma*, 1860, and the *Bullettino*, 1864; see also Noel Desverger's *L'Étrurie*, 1862–64.

FALERNUS AGER, the name of a district in the northern part of Campania. The term has sometimes a wide and sometimes a restricted signification, being used with reference to the whole of the fertile plain between the Massican (now Mandragone) hills and the river Vulturnus, but more commonly as denoting that portion of the plain lying at the foot of the Massican hills between the rivers Vulturnus and Savo, and celebrated for its wines. In the time of Horace these were reputed to be the best of all Italy, but in the time of Pliny their reputation had begun to decline, and they were supplanted in general estimation by those produced in the adjoining Ager Statanus. Before it passed into the hands of the Romans, in 340 B.C., the whole district formed part of the Capuan territory. In 217 B.C. it was desolated by the Carthaginian general Maharbal.

FALIERO, Marino (1274–1355), doge of Venice, was born in 1274. In 1346 he commanded the Venetian forces at the siege of Zara, where, being attacked by Louis the Great of Hungary with a force of 80,000 men, he totally defeated them, inflicting a loss of 8000, and compelling him to abandon all further attempts to raise the siege, which was concluded shortly afterwards by the surrender of the defenders at discretion. As commander of the Venetian fleet he also gained several victories and captured Capo d'Istria. He was elected doge 11th September, 1354. His reign was short, and it had both a disastrous commencement and a tragic close. Very soon after his election the Venetian fleet was captured by the Genoese, and hardly had he concluded a four months' truce with Genoa, when a very trivial incident occurred which resulted in his arrest and execution. It would appear that, though an able general and prudent statesman, Faliero possessed a temper so choleric that when he was provoked reason for a time almost forsook him. On the occasion of the usual court feast on Shrove Thursday, a young nobleman named Michele Steno, perhaps excited by wine, took some liberties with one of the maids of honor, and the doge on that account caused him to be ignominiously expelled from the hall. Provoked at such a public affront Steno went to the hall of audience and wrote on the doge's chair the following words—*Marini Falieri dalla bella moglie, altri la gode ed egli la mantiene* (Marino Faliero, the husband of the beautiful wife; others kiss her, he keeps her). The author of the insult was soon discovered and arrested, but the council sentencing him only to two months' imprisonment, the doge resolved to have adequate revenge, and with this view formed a conspiracy to seize all the nobles and leading citizens, and to make himself despot of Venice. The plot being, however, discovered a short time before the day fixed on, the doge and principal conspirators were arrested, and were executed on the 17th April, 1355.

The reign of Faliero has formed the subject of tragedies by Lord Byron, by Delavigne, and by Albert Lindner; and Hoffman has employed it to furnish materials for a romance. It also forms the subject of the libretto of one of Donizetti's operas. Byron has added to his tragedy a good many notes on the character of Faliero, and on the incidents of his reign, together with an English translation—made by F. Cohen—of the old *Chronicle of Marino Faliero*. The circumstances of Faliero's plot are related in one of the letters of Petrarch, who was his contemporary and friend.

FALK, Johann Daniel (1768–1826), a German author and philanthropist, was born at Dantzic, 20th October, 1768. His parents, who were in poor circumstances, gave him only a scanty education, and strongly opposed his desire to enter one of the learned professions; but notwithstanding their discouragement he managed not only to make himself acquainted with the best German writers, but also to learn French and English. After attending for some time the gymnasium of his native town, he entered the university of Halle with the view of studying theology; but preferring, on second thoughts, a non-professional life, he gave up his theological studies and went to live at Weimar. There he published a volume of satires which procured him the notice and friendship of Wieland, and admission into the literary circles of the city. On the invasion of Germany by the French, Falk joined the army, and so distinguished himself at the battle of Jena that the duke of Weimar created him a counsellor of legation. In 1813 he succeeded in establishing a society for friends in necessity, and about the same time he founded an institute for the care and education of neglected and orphan children, which in 1829 was changed into a free public school. The first literary efforts of Falk took the form chiefly of satirical poetry, and gave promise of greater future excellence than was ever completely fulfilled, for as his later pieces were directed more against individuals than the general vices and defects of society, they gradually degenerated in quality. In 1804 he published a comedy entitled *Amphitryon*, which met with some success, and a tragedy entitled *Prometheus*, which, although in many places deficient in rhythm and melody, and in form more philosophical than dramatic, yet contains many fine thoughts expressed in language truly poetical. From 1797 to 1803 he published a kind of satirical almanac entitled *Taschenbuch für Freunde des Scherzes und der Satire*. In this publication he wrote a description of the hospitals of Berlin under the satirical title of *Denkwürdigkeiten der Berliner Charité auf das Jahr 1797*, which led to the appointment of a committee to inquire into their management, and finally to their reform. In 1806 Falk founded a critical journal under the title of *Elysium und Tartarus*. He also contributed largely to contemporary journals. He enjoyed the acquaintance and intimate friendship of Goethe, and his account of their intercourse was published after the death of both under the title *Goethe aus näherm persönlichen Umgange dargestellt*, Leipsic, 1832. Falk died 14th February, 1826.

See *Johannes Falks Erinnerungsblätter aus Briefen und Tagebüchern, gesammelt von dessen Tochter Rosalie Falk*, Weimar, 1868.

FALKE, Johann Friedrich Gottlieb (1823–1876), a German historian, was born at Ratzeburg, 20th April, 1823. He entered the university of Erlangen in 1843, and soon thereafter began to devote his attention to the history of the German language and literature. In 1848 he went in the capacity of tutor to Munich, where he remained five years, and diligently availed himself of the use of the Government library for the purpose of prosecuting his historical studies. In 1855 he was appointed secretary of the German museum at Nuremberg, and in 1859 keeper of the manuscripts. With the aid of the manuscript collections in the museum he now turned his attention chiefly to political history, and, along with his brother Jacob, who is still (1878) living, and Johann Müller, established an historical journal under the name of *Zeitschrift für deutsche Culturgeschichte* (4 vols., 1855–59). To this journal he contributed a history of German taxation and commerce. On the latter subject he published separately *Geschichte des deutschen Handels* (2 vols., Leipsic, 1859), and *Die Hansa als deutsche See- und Handelsmacht* (Berlin, 1862). In 1862 he was appointed secretary of the state archives at Dresden, and a little later keeper. He there began the study of Saxon history, still devoting his attention chiefly to the history of commerce and economy. In 1868 he published, at Leipsic, *Die Geschichte des Kurfürsten August von Sachsen in volkswirthschaftlicher Beziehung*, and in 1869 *Geschichte des deutschen Zollwesens*. He died at Dresden, 1st March, 1876.

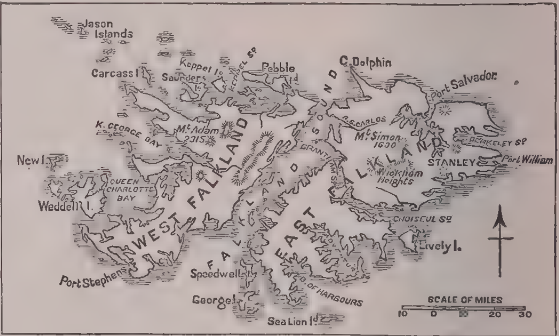
FALKIRK, a municipal and parliamentary burgh and market-town of Scotland, in the county of Stirling, 25½ miles W. by N. from Edinburgh by rail, is situated on a declivity which overlooks the expanse of fertile country called the Carse of Falkirk. The town consists of one wide street, with a number of narrow streets and lanes branching off from or running parallel to it. The houses are generally lofty and well built. The parish church, erected in 1811, has a fine steeple 130 feet high. There are also places of worship for the Free Church, United Presbyterians, Independents, and Roman Catholics. Continuous lines of houses connect Falkirk with the villages of Grahamston and Bainsford, and extend thence to Carron, which lies about two miles N. of the town, and is celebrated for its iron-works. Though Falkirk is not itself a manufacturing town, yet in the neighborhood there are extensive works of various kinds. In addition to the Carron iron-works there is the Falkirk foundry at Bainsford, and several large collieries, distilleries, flour-mills, etc. The three trysts or cattle fairs held at Falkirk annually, on the 2d Tuesday and Wednesday of August, the 2d Monday and Tuesday of September, and the 2d Monday, Tuesday, and Wednesday of October, are the largest in Scotland,—the last being the largest of the three. Population of parliamentary burgh in 1871, 9547; of burgh and suburbs, 11,312.

Falkirk is a town of considerable antiquity, and appears to have been a place of some note in the early part of the 11th century. Its original name was Eglishbreckk, which signifies the "speckled church," in allusion, it is supposed, to the color of the stones, and translated by Buchanan *varium sacellum*. In the valley between Falkirk and the Carron a battle was fought on the 22d July, 1298, between the Scotch under Wallace and the English under Edward I., in which the former were defeated, and two of their chieftains, Sir John Graham and Sir John Stewart, slain. Their graves are still pointed out in the churchyard: that of Graham has a monument with an inscription which has been several times renewed. On a moor a little to the S. W. of the town a battle was fought on 17th January, 1746, between the royal forces and those of the Pretender, in which the rebels were victorious. On this occasion fell Sir Robert Monro of Foulis, and his brother Dr. Monro, whose monument is to be seen in the churchyard. In the vicinity traces of the Roman wall are still visible. Falkirk was made a burgh of barony in 1600, and in 1646 a burgh of regality. In 1715, by the forfeiture of the earl of Linlithgow, its superiority was vested in the crown, but it did not become a municipal burgh till the passing of the Reform Act of 1832, when it also obtained the privilege, in conjunction with Airdrie, Lanark, Hamilton, and Linlithgow, of returning a member to parliament.

FALKLAND, a royal burgh of Scotland, county of Fife, is situated at the N. foot of the East Lomond Hill, 22 miles N.N.W. of Edinburgh. It consists of a single street with some cross lanes, the houses being in many cases thatched and of an antique and primitive appearance. The inhabitants are engaged chiefly in weaving and flax-spinning. Falkland is noted for its royal palace, originally a stronghold of the Macduffs, earls of Fife, but forfeited to the crown in 1424. The palace was greatly enlarged and improved by James V., who died there in 1542, and was also the favorite residence of James VI., on account of the fine park and the abundance of deer. The east side of the building was accidentally burnt in the reign of Charles II., and the park was ruined during the time of Cromwell, when the fine oaks were cut down in order to build a fort at Perth. In one of the dungeons David, duke of Rothesay, eldest son of Robert III., was starved to death by the duke of Albany (the king's brother) and the earl of Douglas in 1402. In 1715 the famous Rob Roy garrisoned the palace, and laid the burgh and vicinity under contribution. The palace till recently was allowed to fall into decay, but what remained of it has been renovated, and is now occupied as a dwelling house. The western front has two round towers, similar to those at Holyrood, and the southward range of buildings is ornamented with niches and statues, which impart to it a close resemblance to the Perpendicular style of the semi-ecclesiastical architecture of England. Falkland was constituted a royal burgh by James II. in 1458, and its charter was renewed by James VI. in 1595. Population of the burgh, 1144; of the burgh and suburbs, 1283.

FALKLAND, VISCOUNT. See CARY, LUCIUS.

FALKLAND ISLANDS (French, *Malouines*; Spanish, *Malvinas*), a group of islands in the South Atlantic, belonging to Britain, and lying about 250 miles E. of the nearest point in the mainland of South America, between the parallels of 51° and 52° 45′ S. and the meridians of 57° 20′ and 61° 46′ W. The islands are about 200 in number, but only two are of considerable size; the largest of these, East Falkland, is 95 miles in extreme length, with an average width of 40 miles, and the smaller, West Falkland, is 80 miles long, and about 25 miles wide. The area of East Falkland is about 3000 square miles, and that of West Falkland 2000. Most of the others are mere islets, the largest 16 miles long by 8 miles wide. The two principal islands are separated by Falkland Sound, a narrow strait from 18 to 2½ miles in width, running nearly due north and south (magnetic). The coast-line of both islands is deeply indented, and many of the bays and inlets form secure and well-protected harbors. East Falkland is almost bisected by two deep fiords, Choiseul and Brenton Sounds, which leave the northern and southern portions connected only by an isthmus a mile and a half wide. The northern portion is hilly, and is crossed by a rugged range, the Wickham Heights, running east and west, and rising in some places to a height of nearly 2000 feet. The remainder of the island consists chiefly of low undulating ground, a mixture of pasture and morass, with many shallow freshwater tarns, and small streams running in all the valleys. The general appearance of the country is tame and uninteresting, not unlike one of the Outer Hebrides. The general coloring is dark brownish-green, relieved along the strike of the hills by veins of white quartzite denuded by the wearing away of softer rocks on both sides, and left projecting on the mountain slopes like dilapidated stone dykes. Two fine inlets, Berkeley Sound and Port William, run far into the land at the north-eastern extremity of the island. Port Louis, until lately the seat of government, is at the head of Berkeley Sound, but the anchorage there having been found rather too exposed, about the year 1844 a town was laid out, and the necessary public buildings were erected on Stanley Harbor, an admirably sheltered recess within Port William. Above Stanley Harbor the land slopes up for a hundred feet or so to a low ridge, beyond which what is called there the "camp" (*campo*) extends nearly level for many miles. The little town of Stanley is built along the shore of the harbor, and stretches a short way up the slope. It has a population of 600 or 700 inhabitants. The houses are mostly square, whitewashed, and gray-slated, much like those of one of the newer small towns in the West Highlands of Scotland. The Government house puts one in mind of a Shetland or Orkney manse, stone-built, slated, and gray, without the least shelter. The Government barrack, occupied by an officer and a company of marines, is a rather imposing structure in the middle of the town, and there is a neat little Episcopal church. Many of the houses belonging to the agents of the Falkland Islands Company, and to the representatives of several private firms, have very pretty greenhouses attached to them, the gay groups of fuchsias and pelargoniums of all the best home varieties contrasting pleasantly with the barrenness without.



Map of the Falkland Islands.

In 1845, Mr. S. Lafone, a wealthy cattle and hide merchant on the river Plate, obtained from Government a grant of the southern portion of the island, a peninsula 600,000 acres in extent, and possession of all the wild cattle on the island for a period of six years, for a payment of £10,000 down, and £20,000 in ten years from January 1, 1852. In 1851, Mr. Lafone's interest in Lafonea, as the peninsula has since been called, was purchased for £30,000 by a company chartered in London for the purpose of turning the islands to more account.

The headquarters of the Falkland Island Company are now at Stanley, where their colonial manager resides, while their grazing and boiling-down operations are carried out in different parts of the islands. The development of the undertaking has necessitated the establishment of stores and workshops at Stanley, and now ships can be repaired and provided in every way, much better and more cheaply there than at any of the South American ports,—a matter of much importance, seeing that a greater amount of injury is done annually to shipping passing near Cape Horn by severe weather than in any other locality in the world. The average number of vessels entering Stanley Harbor in the year is about 50, with an aggregate tonnage of 20,000 tons. Of this number about one-fourth arrive in distress and are repaired at Stanley. Next to Stanley the most important place on East Falkland is Port Darwin, on Choiseul Sound,—a station of the Falkland Island Company, a village chiefly of Scottish shepherds, with a little iron church with schoolhouse attached, and a Presbyterian clergyman and a competent schoolmaster. West Falkland is more hilly near the east island. The principal mountain range, the Hornby Hills, runs north and south parallel with Falkland Sound. Mount Maria, at the back of Port Howard, is 2270 feet high. In 1867 there were no settlers on the west island, and Government issued a proclamation offering leases of grazing-stations on very moderate terms. In 1868 all the available land was occupied, producing an annual revenue of about £1350. Some good houses have lately been built at Port Stephens, Mr. Dean's station on West Falkland.

The Falkland Islands were first seen by Davis in the year 1592, and Sir Richard Hawkins sailed along their north shore in 1594. In 1598 Sebald de Wert, a Dutchman, visited them, and called them the Sebald Islands, a name which they still bear on some of the Dutch maps. Captain Strong sailed through between the two principal islands in 1690, and called the passage Falkland Sound, and from this the group afterwards took its English name. In 1763 the islands were taken possession of by the French, who established a colony at Port Louis on Berkeley Sound; they were, however, expelled by the Spaniards in 1767 or 1768. In 1761 Commodore Byron took possession on the part of England on the ground of prior discovery, and his doing so was nearly the cause of a war between England and Spain, both countries having armed fleets to contest the barren sovereignty. In 1771, however, Spain yielded the islands to Great Britain by convention. As they had not been actually colonized by England, the republic of Buenos Ayres claimed the group in 1820, and formed a settlement at Port Louis which promised to be fairly successful, but owing to some misunderstanding with the Americans it was destroyed by the latter in 1831. After all these vicissitudes the British flag was once more hoisted at Port Louis in 1833, and since that time the Falkland Islands have been a regular British colony under a governor, and the seat of a colonial bishopric. The population of the Falkland Islands is at present about 1250, by far the greater number being English and Scottish, with a few Buenos-Ayrean Gauchos. The number of children on the school-roll in 1876 was 127. The exports now consist almost entirely of wool and tallow, with a few hides. The rearing of cattle is rapidly giving place to sheep-farming, which is found to pay better. There are now upwards of 200,000 sheep on the islands, and they yield heavy fleeces of wool of fine quality. In 1876 the value of exports amounted to £37,121, of which wool sales account for £25,453. A process adopted a few years ago by the Falkland Island Company of boiling down the carcasses of sheep for tallow is likely to prove successful, and to add another valuable export. The trade in sealskins, which was at one time of great value, is now almost at an end, and there is also a great falling off in the export of oil, the whales and seals which were at one time very numerous, particularly about West Falkland, having almost entirely left the coasts.

The Falkland Islands correspond very nearly in latitude in the southern hemisphere with Middlesex in the northern, but the conditions of climate are singularly different. The temperature is very equable, the average of the two midsummer months being about 47° Fahr., and that of the two midwinter months 37° Fahr. The sky is almost constantly overcast, and rain falls, mostly in a drizzle and in frequent showers, on about 250 days in the year. The rainfall is not great, only about 20 inches, but the mean humidity for the year is 80, saturation being 100. Owing to the absence of sunshine and summer heat, and the constant fog and rain, wheat will not ripen, barley and oats can scarcely be said to do so, and the common English vegetables will not produce seed in the gardens. Still the inhabitants seem to get accustomed to their moist, chilly surroundings, and the colony is remarkably healthy.

The Falkland Islands form essentially a part of Patagonia, with which they are connected by an elevated submarine plateau, and their flora is much the same as that of Antarctic South America. The trees which form dense forest and scrub in southern Patagonia and in Fuegia are absent, and one of the largest plants on the islands is a gigantic woolly ragweed (*Senecio candicans*) which attains in some places a height of three to four feet. A half-shrubby veronica (*V. decussata*) is found locally on the west island. The greater part of the "camp" is formed of peat, which in some places is of great age and depth, and at the bottom of the bed very dense and bituminous. The peat is different in its character from that of the north of Europe: cellular plants enter but little into its composition, and it is formed almost entirely of the roots and stems of *Empetrum rubrum*, a variety of the common crowberry of the Scottish hills with red berries, called by the Falklanders the "diddle-dee" berry; of *Myrtus nummularia*, a little creeping myrtle whose leaves are used by the shepherds as a substitute for tea; of *Caltha appendiculata*, a dwarf species of marsh-marigold; and of some sedges and sedge-like plants, such as *Astelia pumila*, *Gaimardia australis*, and *Bostkovia grandiflora*. There is an intention of establishing a work in Stanley for converting the peat into patent compressed fuel.

Two vegetable productions of the Falklands, the "balsam bog" and the "tussock grass," have been objects of curiosity and interest ever since the first accounts of the islands reached us. In many places the low grounds look at a little distance as if they were scattered over with large gray boulders, three or four to six or eight feet across. To heighten the illusion many of these blocks are covered with lichens, and bands of grass grow in soil collected in crevices, just as they would in little rifts in rocks. These boulder-like masses are single plants of *Bolax glebaria*, an umbelliferous plant. The lumps of balsam-bog are quite hard and nearly smooth, and only when looked at closely are they seen to be covered with small hexagonal markings like the calices of a weathered piece of coral. These are the circlets of leaves and the leaf-buds terminating a multitude of stems which have gone on growing with extreme slowness and branching dichotomously for an unknown length of time, possibly for centuries, ever since the plant started as a single shoot from a seed. The growth is so slow, and the condensation from constant branching is so great, that the block becomes as hard as the boulder which it so much resembles, and it is difficult to cut a shaving from the surface with a sharp knife. Under the unfrequent condition of a warm day with the sun shining, a pleasant aromatic odor may be perceived where the plants abound, and a pale yellow astringent gum exudes from the surface, which is used by the shepherds as a vulnerary. The "tussock-grass," *Dactylis cæspitosa*, is a wonderful and most valuable natural production, which, owing to the introduction of stock into the islands, will probably ere long become extinct. It is a reed-like grass, which grows in dense tufts from six to ten feet high from stool-like root-crowns. The leaves and stems are most excellent fodder, and are extremely attractive to cattle, but the lower parts of the stems and the crowns of the roots have a sweet nutty flavor which makes them irresistible, and cattle and pigs, and all creatures herbivorous and omnivorous, crop the tussocks to the ground, when the rain getting into the crowns rots the roots. The work of extermination has proceeded rapidly, and now the tussock grass is confined to patches in a narrow border round the shore and to some of the outlying islands. The land fauna of the Falklands is very scanty. A large wolf-like fox, which seems to be indigenous, was common some years ago, but is now nearly exterminated. Some herds of cattle and horses run wild; but these were of course introduced, as were also the wild hogs, the numerous rabbits, and the much less numerous hares. Land-birds are few in number, and are mostly strays from Fuegia. Sea-birds are very abundant, and, probably from the islands having been comparatively lately peopled, they are singularly tame. Several species of wild geese, some of them very good eating, fly about in large flocks, and are so fearless that the boys bring them down at will by entangling their wings with a form of the "bolas" made with a pair of the knuckle-bones of an ox.

The Falkland Islands consist entirely, so far as we know at present, of the older palæozoic rocks, Lower Devonian or Upper Silurian, slightly metamorphosed and a good deal crumpled and distorted, in the low grounds clay slate and soft sandstone, and on the ridges hardened sandstone passing into the conspicuous white quartzites. There do not seem to be any minerals of value, and the rocks are not such as to indicate any probability of their discovery. Galena is found in small quantity, and in some places it contains a large percentage of silver. The dark bituminous layers of clay slate, which occur intercalated among the quartzites, have led, here as elsewhere, to the hope of coming upon a seam of coal, but it is entirely contrary to experience that coal of any value should be found in rocks of that age.

Most of the valleys in the Falklands are occupied by pale glistening masses which at a little distance have very much the look of some of the smaller Swiss glaciers. Examined a little more closely these are found to be vast accumulations of blocks of quartzite, irregular in form, but having a tendency to a rude diamond shape, from two to eight or ten or twenty feet in length, and half as much in width, and of a thickness corresponding with that of the quartzite ridges on the hills above. The blocks are angular, like the fragments in a breccia, and rest irregularly one upon the other, supported in all positions by the angles and edges of those beneath. The whole mass looks as if it were, and no doubt it is, slowly sliding down the valley to the sea. These "stone rivers" are looked upon with great wonder by the shifting population of the Falklands, and they are shown to visitors with many strange speculations as to their mode of formation. Their origin is not far to seek. The hard beds of quartzite are denuded by the disintegration of the softer layers. Their support being removed they break away in the direction of natural joints, and the fragments fall down the slope upon the vegetable soil. This soil is spongy, and, undergoing alternate contraction and expansion from being alternately comparatively dry and saturated with moisture, allows the heavy blocks to slip down by their own weight into the valley, where they become piled up, the valley stream afterwards removing the soil from among and over them. They certainly present a very striking phenomenon.

See Pernetz, *Journal historique d'une voyage faite aux îles Malouines en 1763 et 1764*, Berlin, 1767; S. Johnson, *Thoughts on the late Transactions respecting Falkland's Islands*, 1771; T. Falkner, *Description of Patagonia and the Falkland Islands*, 1774; B. Penrose, *Account of the last Expedition to Port Egmont in the Falkland Islands*, 1775; *Observations on the forcible occupation of Malvinas by the British Government in 1833*, Buenos Ayres, 1833; *Reclamacion del Gobierno de las provincias Unidas de la Plata contra el de S. M. Britanica sobre la soverania y possesion de las Islas Malvinas*, London, 1841; Fitzroy, *Narrative of the surveying voyage of H. M. S. Adventure and Beagle*, 1839; Darwin, *Voyage of a Naturalist round the World*, 1845; S. B. Sullivan, *Description of the Falkland Islands*, 1849; W. Hadfield, *Brazil, the Falkland Islands*, etc., 1854; W. Parker Snow, *Two years' cruise off the Tierra del Fuego, the Falkland Islands*, etc., 1857; Sir Wyville Thomson, *Voyage of the Challenger*, 1877. (C. W. T.)

FALLMERAYER, Jakob Philipp (1791–1861), a German traveller and historical investigator, best known for his opinions in regard to the ethnology of the modern Greeks, was born, the son of a poor peasant, at Tschötsch, near Brixen in Tyrol, 10th December, 1791. In 1809 he absconded from the cathedral school at Brixen and repaired to Salzburg, where he studied theology, the Semitic languages, and history. At the university of Landshut, to which he next removed, he at first applied himself to jurisprudence, but soon again devoted his exclusive attention to history and philology. During the Napoleonic wars the still youthful student forsook his books, joined the Bavarian infantry in 1813, took part in a battle near Hanau, and accompanied his regiment to France. Receiving his discharge in 1818, he was successively engaged as teacher and professor in the gymnasium at Augsburg, and in the pro-gymnasium and lyceum at Landshut. The three years from 1831 to 1834 he spent in travel, along with the Russian Count Ostermann Tolstoi, visiting Egypt, Palestine, Syria, Cyprus, Rhodes, Constantinople, Greece, and Naples. On his return he was elected in 1835 a member of the Royal Bavarian Academy of Sciences, but he soon after left the country again on account of political troubles, and spent the greater part of the next four years with Count Tolstoi at Geneva. Constantinople, Trapezunt, Athos, Macedonia, Thessaly, and Greece were visited by him during 1840–41; and after some years' residence in Munich he returned in 1847 to the East, and travelled through parts of Palestine, Syria, and Asia Minor. The political changes in Bavaria invited him home in 1848, and he was appointed professor of history in the Munich university, and made a member of the national congress at Frankfort-on-the-Maine. He there joined the left or opposition party, and in the following year he accompanied the rump-parliament to Stuttgart, a course of action which naturally led to his expulsion from his professorate. During the winter of 1849–50 he was obliged to live in Switzerland to escape arrest, but the amnesty of April, 1850, enabled him to return to Munich. He died April 26, 1861. His contributions to the history of Greece in the Middle Ages are of great value; and though his theory that the Greeks of the present day are almost pure Slavonians, with hardly a drop of true Greek blood in their veins, has not been accepted *in toto* by other investigators, it has served to modify the opinions of even his greatest opponents. A criticism of his views will be found in Hopf's *Geschichte Griechenlands* (reprinted from Ersch and Gruber's *Encycl.*), and in Finlay's *History of Greece in the Middle Ages.*

His works are—*Geschichte des Kaiserthums Trapezunt*, Munich, 1827; *Geschichte der Halbinsel Morea im Mittelalter*, Stuttgart, 1830–36; *Ueber die Entstehung der Neugriechen*, Stuttgart, 1835; "Originalfragmente, Chroniken, u. s. w., zur Geschichte des K. Trapezunts," Munich, 1843, in *Abhandl. der. hist. Classe der K. Bayerisch Akad. v. Wiss.*; *Fragmente aus dem Orient*, Stuttgart, 1845; *Denkschrift über Golgotha und das heilige Grab*, Munich, 1852, and *Das Todte Meer*, 1853—both of which had appeared in the *Abhandlungen* of the Academy; *Das Albanesische Element in Griechenland*, III. parts, in the Abhandl. for 1860–66. After his death there appeared at Leipsic in 1861, under the editorship of A. Thomas, three volumes of *Gesammelte Werke*, containing *Neuen Fragmente aus dem Orient*, *Kritische Versuche*, and *Studien und Erinnerungen aus meinem Leben.* A sketch of his life will also be found in L. Steub, *Herbsttage in Tyrol*, Munich, 1867.

FALLOPIUS, or Fallopio, Gabriello (1523–1562), one of the greatest anatomists of his time, was a native of Modena. He studied medicine at Ferrara, and, after a European tour, became teacher of anatomy in that city. He thence removed to Pisa, and from Pisa, at the instance of Cosmo I., grand-duke of Tuscany, to Padua, where, besides the chairs of anatomy and surgery and of botany, he held the office of superintendent of the new botanical garden. He died October 9, 1562. Only one treatise by Fallopius appeared during his lifetime, namely the *Observationes Anatomicæ*, Venice, 1561. His collective works, *Opera genuina omnia*, were published at Venice in 1584. For an account of the services which Fallopius rendered to anatomical science, see Anatomy, vol. i. p. 709.

FALL RIVER, a city of the United States, Massachusetts, is situated on Mount Hope Bay, the north-east arm of Narraganset Bay, 46 miles S. of Boston. The Fall river, which here joins the Taunton, has a descent of 130 feet in less than half a mile, and its great water-power was at an early period of much advantage for the development of the manufactures of the town, but most of the mills are now driven by steam. The town is well built, and many of the streets are finely adorned with trees. The harbor on Taunton river is safe and easy of access, and has depth of water sufficient for the largest ships. Fall river has a large coasting trade, and is engaged in the whale and other fisheries. The total value of foreign and domestic imports for the year ending June 30, 1877, was $12,358, and of exports $4795. The principal industry is the manufacture of cotton goods, especially print cloths, but there are also woollen factories, bleaching works, foundries, a shipbuilding yard, and planing mills. In the neighborhood there are valuable granite quarries. Fall River is the terminus of the line of steamers in the route from New York to Boston. It was incorporated as a town in 1803, and received a city charter in 1854; and in 1862 Fall River, Newport county, with 3377 inhabitants, was added to it. The population in 1850 was 11,522, and in 1870, 26,766.

FALMOUTH, a municipal and parliamentary borough and market-town of England, county of Cornwall, on the south side of Falmouth Harbor, 15 miles N.N.E. of Lizard Point, and 267 miles W.S.W. of London. The town consists chiefly of a long and narrow street extending along the shore. The principal public buildings are the hall of the Cornwall Polytechnic Society, the mechanics' institute, the town-hall, and the market-house. In the early part of the 17th century Falmouth consisted only of a few fishermen's huts, but soon after this Sir John Killigrew, having obtained the permission of James I., constructed a new quay and laid the foundation of the present town. Its subsequent prosperity was a consequence of the excellence of its harbor, and its proximity to Land's End. For about 150 years it was the port from which the mail packets for the Mediterranean, Spain, the West Indies, and South America were despatched; and though these steamers now start from other ports it maintains steam communication with London, Liverpool, Dublin, Penzance, Plymouth, and Southampton. The harbor is one of the best refuges for shipping in England. Its entrance between St. Anthony's Head on the E. and Pendennis Castle on the W. is about a mile in width, and it thence stretches inland about five and a half miles. It has depth of water and excellent anchorage for the largest ships, and vessels of considerable burden can discharge their cargoes at the quay. In 1876 the number that entered the port was 803, with a tonnage of 118,617; the number that cleared 384, tonnage 26,522. The total value of imports was £240,474, and of exports £5261. The exports include copper, tin, tin-plates, woollen goods, and fish. Falmouth along with Penryn returns two members to parliament. The population of the municipal borough in 1871 was 5294.

FALSE POINT, a land-locked harbor in the Cuttack district of Orissa, situated in 20° 20′ N. lat. and 86° 47′ E. long., and reported by the famine commissioners in 1867 to be the best harbor on the coast of India from the Húglí to Bombay. It derives its name from the circumstance that vessels proceeding up the Bay of Bengal frequently mistook it for Point Palmyras, a degree further north. The anchorage is safe, roomy, and completely land-locked. The capabilities of False Point as a harbor remained long unknown, and it was only in 1860 that the port was opened. It was rapidly developed, owing to the construction of the Orissa canals. Two navigable channels lead inland across the Mahánadí delta, and connect the port with Cuttack city. The trade of False Point is chiefly with other Indian harbors, but a large export trade in rice and oil-seeds has sprung up with Mauritius, the French colonies, and France. False Point is now a regular port of call for Anglo-Indian coasting steamers. Its capabilities were first appreciated during the Orissa famine of 1866, when it afforded almost the only means by which supplies of rice could be thrown into the province. Between 1863–64 and 1874–75 the value of the export and import trade of False Point has increased from £51,921 to £261,212, or upwards of five times, and the number of vessels visiting the port from 16 to 110. A lighthouse is situated a little to the south of the anchorage, on the point which screens it from the southern monsoon, in 20° 19′ 52″ N. lat., 86° 46′ 57″ E. long.

FALSTER, an island in the Baltic, belonging to Denmark. It is richly wooded and well cultivated, and is very fertile, especially in fruits. Area, 180 square miles; population (1870), 27,763. See DENMARK.

FALUN, or FAHLUN, a town of Sweden, capital of a laen of the same name, which, however, is also called Dalarna or Dalecarlia, is situated in a bare and rocky country near the W. shore of Lake Runn, 73 miles W. of Gefle. The town is built chiefly of timber, and the inhabitants are mostly engaged in mining and smelting. West of the town are the celebrated Falun copper mines, the oldest and most celebrated in Europe. They are known to have been in existence 600 years ago, but probably their origin is some centuries earlier. Since the 17th century their produce has been gradually decreasing, and while in 1650 they produced nearly 3300 tons the total output in 1874 was only a little over 490 tons. In the town are museums of mineralogy and geology, a school of practical mining, a model room, and a large scientific library. The fumes arising from the copper-smelting works destroy vegetation in the vicinity of the town, but so far from being injurious to human life, they seem often to have acted as a preventative against cholera and other epidemic diseases. Connected with the copper works there are shot, sulphur, vitriol, and Indian red factories. The population of Falun in 1875 was 6694.

FAMAGOSTA. See CYPRUS.

FAMILY. Family is a word of which the etymology but partially illustrates the meaning. The Roman *familia*, derived from the Oscan *famel* (*servus*), originally signified the servile property, the thralls, of a master. Next, the term denoted other domestic property, in things as well as in persons. Thus, in the fifth of the laws of the Twelve Tables the rules are laid down:—SI. INTESTATO. MORITUR. CUI. SUUS. HERES. NEC. SIT. ADGNATUS. PROXIMUS. FAMILIAM. HABETO, and SI. AGNATUS. NEC. ESCIT. GENTILIS. FAMILIAM. NANCITOR; that is, if a man die intestate, leaving no natural heir, who had been under his *potestas*, the nearest agnate, or relative tracing his connection with the deceased exclusively through males, is to inherit the *familia*, or family fortune of every sort. Failing an agnate, a member of the *gens* of the dead man is to inherit. In a third sense, the Roman word *familia* was applied to all the persons who could prove themselves to be descended from the same ancestor, and thus the word almost corresponded to our own use of it in the widest meaning, as when we say that a person is "of a good family" (Ulpian, *Dig.*, 50, 16, 195, *fin.*). Leaving for a while the Roman terms, to which it will be necessary to return, we may provisionally define "family," in the modern sense, as the small community formed by the union of one man with one woman, and by the increase of children born to them. These in modern times, and in most European countries, constitute the household, and it has been almost universally supposed that little natural associations of this sort are the germ-cell of early society. The history with which, from childhood, we are best acquainted shows us the growth of the Jewish nation from the one household of Abraham. It is true that his patriarchal family differed from the modern family in one respect. It was polygamous, but, as female chastity was one of the conditions of the patriarchal family, and as descent through males was therefore recognized as certain, the plurality of wives makes no real difference to the argument. In the same way the earliest formal records of Indian, Greek, and Roman society show us the family firmly established, and generally regarded as the most primitive of human associations. Thus, Aristotle derives the first household (*οἰκία πρώτη*) from the combination of man's possession of property—in the slave or in domesticated animals—with man's relation to woman, and he quotes Hesiod: *οἶκον μὲν πρώτιστα γυναῖκα τε βοῦν τ' αροτῆρα* (*Politics*, 1, 2, 5). The village, again, with him is a colony or offshoot of the household, and monarchical government in states is derived from the monarchy of the eldest male member of the family. Now, though certain ancient terms, introduced by Aristotle in the chapters to which we refer, might have led him to imagine, as we shall see, a very different origin of society, his theory is, on the face of it, natural and plausible, and it has been almost universally accepted. The beginning of society, it has been said a thousand times, is the family, a natural association of kindred by blood, composed of father, mother, and their descendants. In this family, the father is absolute master of his wife, his children, and the goods of the little community; at his death, his eldest son succeeds him; and in course of time this association of kindred, by natural increase and by adoption, develops into the clan, *gens*, or *γένος*. As generations multiply, the more distant relations split off into other clans, and these clans, which have not lost the sense of primitive kinship, unite once more into tribes. The tribes again, as civilization advances, acknowledge themselves to be subjects of a king, in whose veins the blood of the original family runs purest. This, or something like this, is the common theory of the growth of society.

On the other side, the following facts are to be noticed:—(1) In many barbarous communities the family, in our sense of the word, does not exist. (2) The traditions of civilized races report a similar state of things in their early experience. (3) The domestic institutions of savages, and traces of the same manners among cultivated races, point to an age when the family was not constituted in the modern way. (4) The larger tribal associations of savages were clearly not developed out of the monogamous or patriarchal family. (5) The larger tribal associations of Greece, Rome, and India bear marks of having been evolved out of the tribal associations of savages. If these points can be proved, the family is not the earliest, but one of the latest conquests of civilization. We shall consider these points in order.

1. At whatever epoch civilized travellers have visited peoples of less cultivation, they have noted, with unconcealed surprise, not the family, but promiscuity and polyandry. They have found men and women living together in what seemed unregulated community, or they have found that the woman had several husbands, and often that these husbands were brothers. They have alleged that the woman, not the man, was really head of the household, that kinship was traced through the female line, on account of the certainty of that sort of genealogy, and consequently that a man's children belonged, not to his own family, but to that of the wife, in whose affections he had only a limited or transitory share. It may be presumed, with some confidence, that these customs, observed in lands and ages widely apart, cannot have grown out of the monogamous or patriarchal family as we know it. The limitless area in which such practices have been usual may be gathered from a few examples. Thus Herodotus says of the Agathyrsi, a Scythian people (iv. 104): "They have their women in common, that they may all be brothers of each other." The Nasamones (iv. 172) have similar customs; of the Massagetæ (i. 216) it is said that each marries a wife, *ταύτῃσι δὲ ἐπίκοινα χρέωνται.* Aristotle alludes to similar promiscuity among the Libyans (*Pol.*, ii. 3, 9); they have their women in common, and distribute the children by their likeness to the men. Diodorus Siculus reports the same manners among the Troglodytes and the Ichthyophagi on the coast of the Red Sea. The Auseis by the Libyan lake Tritonis, though they seem to have set store on the chastity of unmarried women, are said by Herodotus to have lived like cattle, with no permanent cohabitation (iv. 180). These are examples of reported promiscuity in ancient times. Though the observers may have overlooked, and probably did overlook, some regulations, yet it is plain that in the societies spoken of the monogamous or patriarchal family cannot have existed, and so cannot have been the germ of such wider tribal associations as were then established. Turning to modern savages, we find the custom of lending wives, as an act of friendliness and hospitality, very common. This may be no more than mere profligacy, in a society where male kin is recognized; but the marriage custom of Thibet, which assigns to a woman several brothers as joint husbands, cannot be thus explained. This amazing practice is the rule of life "among thirty millions of respectable people" (Wilson, *Abode of Snow*). As to the area over which some form of polyandry extends, the reader may consult Mr. M'Lennan's *Primitive Marriage* (Edinburgh, 1865, pp. 178, 183), where it is traced "to points half round the globe." Cæsar describes something like it among the inhabitants of Britain (*De Bello Gallico*, lib. v. c. 14): "Ten or twelve men have wives in common, and chiefly brothers share with brothers, and father with children." According to a fragment of Polybius, the same fraternal arrangement was not unknown among the Spartans.

Among the Nairs of Malabar, a woman has several husbands, but these are not brothers (*Asiatic Researches*, vol. v. p. 13; Hamilton's *Account of East Indies*, vol. i. p. 308; Buchanan's *Journey*, vol. ii. p. 411). Among the Nairs the woman lives with her mother or brothers, or in other cases has a house of her own, where she receives her husbands. "No Nair knows his father, and every man looks upon his sister's children as his heirs" (Buchanan, ii. 412). Some other examples of very loose relations between the sexes will be found in Mr. Herbert Spencer's *Principles of Sociology*, vol. i. chap. 5, 6. But, to be brief, we strike on instances as soon as we look below the surface of civilization. Thus, in the Marquesas Islands, Mr. Melville (*Narrative of a Four Months' Residence*, 1846, p. 212) describes polyandry, and asks, with some *naïveté*, "Where else could such a practice exist even for a single day?" He would have found the practice among the Tsonnotouan Iroquois. "La polygamie qui n'est pas permise aux hommes, l'est pourtant aux femmes" (Lafitau, *Mœurs des Sauvages Américains*, vol. i. p. 555, 1726). If we are to maintain, as it was usual to declare, that "it is difficult to say of what races of men it is *not* allowable to lay down that the society in which they are united was originally organized on the patriarchal model," we must believe that some strange necessity, or some monstrous profligacy destroyed the patriarchal model among the people whose manners we have been studying.

2. If we can trust the traditions of Indo-European and other polite peoples, they too once lived in a stage which can hardly be discerned from promiscuity, and they too allotted many husbands to one wife. Beginning with Greece, we find the legend in Suidas (p. 3102), that the women of Attica abandoned themselves to unchecked vice, and that the male parentage of children could not be ascertained. According to the story of Varro (Augustine, *De Civ. Dei*, l. xviii. c. 9), it was Cecrops, the serpent-king, who first instituted marriage, just as the Australian natives credit the lizard with the discovery. The Hindoos give it to Svetaketu, before whose date "women were unconfined, and roamed at their pleasure. . . . This ancient custom is even now the rule for creatures born as brutes . . . and it is still practised among the northern Kurus" (Muir, *Sanskrit Texts*, part ii. p. 336). The Egyptians attributed the origin of marriage to the rule of Menes; the Chinese, to Fohi. As to polyandry, among Aryans of India, a famous passage in the *Mahabharata* tells how the five brothers Pandava "married the fair Draaupadi with eyes of lotus blue." The whole legend of these princes is so marked with the stamp of polyandrous institutions that the very terminology of polyandry, the system of nomenclature called "classificatory," is retained. Grand-uncles, in this episode of the *Mahabharata*, as among the Red Indians, are called grandfathers, and uncles fathers.

If, then, the Aryan race was not originally organized like the polyandrous Thibetans, the legends which declare these facts are at least singular examples of "undesigned coincidence." Before coming to that conclusion, it is now necessary to examine certain symbolic customs, certain laws of inheritance and of prohibited degrees, and so to determine whether the looser relations of savages may not have been the material out of which the modern family was gradually fashioned. This can scarcely be called a new, though it has never been a popular opinion. Mr. Millar, professor of law in the university of Glasgow, expressed it distinctly in his *Origin of the Distinction of Ranks*, p. 47 (4th edition, Edinburgh, 1806).

3. If the practices which make kindred through males difficult or impossible to recognize were ever universally prevalent, they will have left vestiges of their existence in the custom of tracing descent through females. Again, where that custom is met with, though marriage has become fixed, and where women are mistresses of the household and heads of the family, it is not easy to give any other explanation of these facts than this, that they are survivals from a time when the union of the sexes was vague and temporary. Where, then, do we meet with examples of kindred traced through the female line? Kindred through women is recognized in Australia (with exceptions among certain tribes), in the Marianne Islands, in Fiji, Tonga, and some other isles of the Pacific, and in the Carolina Islands. Among the Kars of the Golden Chersonese, the tribes are divided into Sgans, who recognize male descent, and Pwos, who reckon by the mother's side. The natives of the province of Keang-se "are celebrated among the natives of the other Chinese provinces for the mode or form used by them in address, which is Laon peaon," paraphrastically translated (Morgan, *Systems of Consanguinity and Affinity of the Human Family*, p. 452), "Oh, you old fellow, brother mine by some of the ramifications of *female* relationship!" To select some more modern instances from M. Giraud Teulon's collections (*Origine de la Famille*, Geneva, 1874, p. 15), the Singhalese, the Nairs of Malabar, the Kocchs, an Indian tribe, and the Zaporogue Cossacks, with the red men of North America as a rule, and the Indians of British Guinea, to whom we may add many African tribes (Bowditch, *Mission to Ashantee*, p. 185, London, 1873; Munzinger, *Ost-Afrikanische Studien*, 1864), count kindred by the mother's side. Another collection of examples will be found in Mr. M'Lennan's *Primitive Marriage*. Strabo reports that among the Iberians women were heads of families (i. 214, 319; iii. 165), and Cordier (*Anciennes coutumes de Barége*) shows that among the Basques women inherited property to the exclusion of males as late as the eighteenth century. The legislation of the Revolution changed all this, but a popular song still testifies to the annoyance of *les héritières*. This ancient custom thus fulfils the proverb, "Tout finit par des chansons" (Giraud Teulon, *La Mère chez certains peuples de l'Antiquité*, Paris, 1867, p. 42). Among ancient peoples there are very many more or less distinct vestiges of female kinship. Herodotus, it is true, says of the Lycians (i. 173),

"This custom they have to themselves, and herein agree with no other men, in that they name themselves by the mother's side and not by the father's. And if one ask another who he is, he will recount his maternal descent, and reckon up his mother's maternal ancestors." Now, so far from this mode of deducing descent being peculiar to the Lycians, it was in vogue among the Locrians (Polybius, 12, v., and *Excerpta Hist. Græc. Frag.*, Rome, 1827, p. 384). In the bilingual Etruscan inscriptions, according to M. Giraud Teulon (*Origine de la Famille*, p. 21), to whom we owe many of these citations, "the Etruscan text contains only the name of the mother of the dead, while the Latin text gives that of the father." Certain Egyptian mortuary inscriptions give the name of the mother, while the accompanying Greek text gives that of the father. A stele found in the ruins of the temple at Napata by Mariette Bey (*Revue Archéologique*, May, 1873) shows us a monarch justifying his claim to the throne by enumerating the women of his maternal ancestry. Future historians will no doubt explain the apparent coexistence of two systems of kindred in Egypt. Meanwhile, it is noteworthy that Herodotus (ii. 35) declares that daughters were compelled by law to maintain their parents, while sons were free to do as they pleased. This report has been curiously confirmed by the legal documents of certain private Egyptian families, lately deciphered by M. Revillout. We see the woman mistress of the household, and owner of the property.

Many other ancient examples are published by the Baron d'Eckstein (*Revue Archéologique*, 1853), but M. d'Eckstein's speculations about race need not be accepted. Millar (*op. cit.*, p. 48) quotes some survivals of the custom of tracing pedigree and deriving condition through women: "If any one be born of a Campanian father, and a mother Puteolan, he is a Campanian citizen, unless, *by some particular custom* (*privilegio aliquo*), his *maternal* descent is to be reckoned." Among places where this local custom ruled, Delphi is mentioned. The great collections of the facts known about the ancient position of women as heads of the family is Bachofen's *Das Mutterrecht*, in which somewhat crude speculations about religion are introduced. The most classical example of a tradition of gynæcocracy is that often-quoted tale of Varro's preserved by St. Augustine (*De Civitate Dei*, lib. xiii. c. 9). In the time of Cecrops, the serpent-king, a dispute arose between Pallas and Poseidon, which was settled by the votes of the Athenians. In these days women possessed the franchise, and a woman's vote turned the scale in favor of Pallas. To appease Poseidon, the Athenian men resolved that women should no more be admitted to the assemblies, nor should children take their names from the mother's family. In this tradition survives a memory of the Red Indian and Australian practice, which makes the child belong to the mother's clan, and also a memory of the political rights, so to speak, which women enjoyed among the ancient Britons, among the Iroquois of Lafitau's time, and which take the shape of a considerable share in the despotism of African races. It may be said that if women have ever enjoyed these privileges it is odd that among the least cultivated peoples, such as the Australians, they are treated as slaves. The reply is—if the Australians were a people of barbaric wealth, like many African nations, and if the certainty of succession to the "royal stool" and the royal treasures were a matter of the utmost moment to the state, it is not improbable that the ancient custom of female kinship would have given, among them too, dignity, importance, and power to women. Thus we know from several sources that

> From the nobility of the mother
> Should always be the right to the sovereignty

among the Celts in Scotland (M'Lennan, *Primitive Marriage*, 1865, p. 86, quoting Nennius; the *Anglo-Saxon Chronicle*, Rolls series, p. 1). Even in the *Mahabharata* there is a vestige of this system. Vasouki, the Naga (serpent) king, wished to have an heir. Instead of marrying, he found a partner for his *sister* Djaratkarou. The sister's son succeeded. Compare Bowditch's *Ashantee* (p. 185), "Their extraordinary rule of succession excludes all children but those of a *sister*, and is founded on the argument that, if the wives of the brothers are faithless, the blood of the family is entirely lost in the offspring, but, should the daughters deceive their husbands, it is still preserved." In leaving this part of the subject we may ask, from what considerations, except those indicated by Bowditch, could the rule of inheritance by the mother's side have been derived?

4. It has been shown that the actual practices of many barbarous races make the existence of the patriarchal, and still more of the monogamous, family impossible, and that the traditions of the races called Aryan, with many fragments of their customs, testify to a similar state of things in the past experiences of nations now organized on the basis of the family. We must now ask—(1) Of what nature are the wider tribal associations of savages? (2) How did they come into existence? (3) Are there any vestiges of similar and similarly formed associations among peoples which now possess strict marriage and kinship through males? We find that the Australian black fellows and the red men of North America are grouped in *local tribes*, which generally are named from the lands they occupy. Thus, the Onondagas are people of the hills, the Mohawks people of the flint, the Senecas people of the great hills, the Oneidas people of the granite, and so forth (Morgan, *League of the Iroquois*, 1851). In Australia the tribes take the names of districts, as Ballarat, Wandyalloch, and Moreton Bay. Within these local tribes there are smaller associations, variously called "clans," "families," "septs," "tribes," by travellers. They are, as a rule, governed on this principle in Australia:—"All the children take after the clan of their mother, and no man can marry a woman of the same clan, although the parties be born of parents in no way related, according to our ideas" (G. S. Lang, *Aboriginals of Australia*, Melbourne, 1865, p. 10; Gray's *Journals*, etc., ii. 227). These smaller associations which may not intermarry are named after some animal, vegetable, or other natural object. A member of the Kangaroo associations may not slay or eat the kangaroo, which he holds in honor, and a Paddymelon must abstain from paddymelon. The obvious result of this scheme of prohibited marriage is to make every local tribe contain much the same assortment of smaller communities. Looking at North America, we find the local tribe of Senecas to be composed of sets of persons called by the name of Wolf, Bear, Turtle, Beaver, Deer, Snipe, Heron, Hawk, and many of the same names prevail among Cayugas, Oneidas, Mohawks, and the rest. Just as in Australia, no man may marry a woman of the same name, though she may have been born hundreds of miles away, and may be no sort of relation in our sense of the word. As in Australia, the animal or plant from which each association takes its name is sacred; in America it is called the totem. The oldest Iroquois totems seem, from many legendary and political proofs, to have been Wolf, Bear, and Turtle (Morgan, *Ancient Society*, 1877, p. 70; see, also, M'Lennan, *Fortnightly Review*, 1869–1870). Turning to Africa (Bowditch's *Mission to Ashantee*. p. 181), we read of similar institutions. Livingstone reports similar facts among the Bechwanas, Falkner among the Patagonians, Brooke among the Sea Dyaks, and Garcilasso de la Vega among the lower races of Peru.

The essential features of these associations and groups of kindred are, for our present purpose—(1) Their indubitable growth out of *female* kinship, and the rule which prohibits marriage between persons who are of the same name, and own descent from the same plant, animal, or thing; (2) their existence as stocks of different blood in the same local tribe; and (3) their acknowledgment of kinship with, and of the duty to support in war, or to revenge, other members of the same name. (On this point, see Morgan, *Ancient Society*, p. 78. Compare also *Ancient Society*, p. 175, as to the Louchoux or Kutchin of the Tukon River: "A man does not marry into his own class; . . . the children belong to the grade of the mother; . . . members of the same grade in the different tribes do not war with each other.") For convenience of nomenclature, we shall call all such associations *totem-kin*. The word totem points to the peculiarity of supposed descent from some natural object which gives the name, and "kin" is more convenient than "group" or "clan," because the same totem and the same name cover many scattered groups.

5. The question now rises, Do we meet similar associations among civilized peoples who now possess the family? First, we find Mr. Hart of Canton, saying (*Ancient Society*, pp. 364, 365): "In some parts of the country large villages are to be met with, in each of which there exists but one family name; thus in one district will be found, say, three villages, each containing two or three thousand people,

the one of the Horse, the second of the Sheep, and the third of the Ox family name. . . . Just as among the North American Indians husband and wife are always of different families,—that is, of different surnames. Custom and law alike prohibit marriage on the part of people having the same family surname. The children are of the father's family,—that is, they take his surname." (Compare *Narrative of Two Mahometan Travellers*, Pinkerton, vol. vii.) The Arabian travellers had the same law at home, prohibiting marriage between people of the same family name.

Looking at India we find in the *Institutes of Menu* (iii. 5) that a man of the twice-born classes may not marry "a woman descended from his paternal or maternal ancestors within the sixth degree, nor [in words believed to be a comment on the original] one who is known by her family name to be of the same primitive stock with his father." No one, that is to say, may marry within the *ghotra*, just as no Red Indian may marry within the limits fixed by the totem. If the ghotra was counted, or if the Chinese family name ran, on the female side, Chinese and Brahmans would be exactly in the position of Australian blacks, as far as prohibited degrees are concerned. Mr. Cunningham (*Digest of Hindu Law*, Madras, 1877) says that the old rule about the ghotra is falling into disuse, and that local custom in many places permits it to be disobeyed. Now, just as observers in India note this change of practice, so observers among the Red Indians and Australians note another change of practice. Kindred among these peoples is very gradually beginning to be reckoned by the male line; children are being counted among some tribes in the clan of the father (Morgan, p. 86).

Leaving India, and turning to Greece and Rome, we find the local tribe and, subordinate to the tribe, two forms of associations called the γένος and gens, which are prominent in early history and gradually die out. Thus, though in the Twelve Tables, as we have seen, the members of the gens succeed to the property of an intestate, yet in the 2d century Gaius declares (*Inst.* iii. 17) that all Gentile law had fallen into desuetude. The gens, then, was, as its very name implies, a form of kindred, but old and hastening to decay. The members of a gens, according to Cicero, had a common name, were born of free parents, and were those who *capite non sunt deminuti.* Festus adds that members of a gens are *ex eodem genere orti.*

It must be noticed that, though the members of a gens were of no recognizable kin to each other in one sense, yet they showed a certain *solidarité*—putting on mourning when one of the kin was in disgrace (Livy, vi. 20), sharing common religious rights peculiar to themselves, and at one time having a right to inherit property. All these things point to consciousness of distant blood-relationship. Still one feature of the ghotra seems absent. It is hardly proved that there was a time when Romans might not marry within the gens. Indications of the past existence of the rule are found in the fact that Roman genealogies do not, as it is said, show us examples of marriages between persons of the same gens. More to the point is Plutarch's statement (Περὶ αἰτίων Ῥωμαϊκῶν), "In times past it was unlawful for Romans to mary women of their own kin (συγγενίδας); . . . nay, they did not wed ladies in any degree connected with them by blood, just as now they do not take sisters or aunts, and it was long before they ventured to take cousins to wife." It seems then that, just as in the case of the contemporary ghotra of the Hindus, an ancient and wide prohibition to marry in the gens was thrown off by the Romans. Here it must be noted that the ghotra of the Hindu law of inheritance is not identical with the ghotra in which marriage is prohibited by custom. It is rather a body composed of all the cognates within certain large limitations.

In the example of the Greek γένος we again find the common name a patronymic, generally thought to be derived from a hero. We find that all who bore the name shared certain religious rights, and before Solon's date were co-heirs to property, and took up the blood feud if one of the γένος were slain. Yet the γεννῆται are often defined as *not* akin in blood, so entirely did the old sense of relationship dwindle, in Greece as in Rome. The lexicographers supposed that the γένη were constituted by legislative enactment, νόμῳ τινὶ ἔχοντες κοινωνίαν. (See Meier, *De Gentibus Atticis;* Philippi, *Der Areopag und die Epheten*, Berlin, 1874, p. 68; Schoemann, *Griechische Alterthümer*, Berlin, 1861, vol. i. p. 329, with Schoemann's theory of the growth of the γένος; F. Haase, *Die Athenische Stammverfassung;* also Grote's *History of Greece*, iii. 53.) Now, hard as it is to ascertain the exact nature of the γένος, and of its relation to the tribe, it seems, on the whole, more analogous to the totem-kin than to the caste or joint family of the modern Hindus. (See Sir Henry Maine, "South Slavonians and Rajpoots," *Nineteenth Century*, December, 1877.) A common name, co-heirship, the duty of avenging a member, all point to the idea of kinship. As to exogamy, a Greek could certainly marry in his own γένος, for the common name went by the father's side, and a Greek might marry his father's though not his mother's daughter. It has been argued that the prohibition to marry a uterine sister, though kinship in historic Greece went by the male line, indicates a past when the maternal tie was more strict,—when, in fact, a man who married his uterine sister married *within* the γένος, and a man who took his half-sister by the father's side married outside the γένος. Here it may be observed that Aristotle (*Pol.*, 1, 2, 5, 6) gives as very ancient synonyms of γεννῆται the terms ὁμογάλακτες (nourished on the same milk), ὁμοσίπνοι (eating from the same vessel), ὁμοκάπνοι (warmed by the same fire). These terms speak of a time when motherhood or fosterage, when community of shelter, not blood kinship, were the bonds that kept members of the same kin together. The words may be compared with Gaelic *teadhloch* and *coediche*, "Gaelic names for family, signifying, the first, having a common residence, the second those who eat together" (M'Lennan, *Prim. Mar.*, p. 154).

It has been usual, almost universal, to explain the Greek γένος and Roman gens by simply saying, like Mr. Freeman (*Comparative Politics*, Macmillan, 1873, p. 111), "The family grew into the clan, the clan grew into the tribe." Mr. Freeman says we can trace this process best "among men of our own blood." But when we examine the early associations of the English (Kemble's *Saxons in England*, vol. i. p. 458), we find, just as in America, just as in Australia, groups of kindred of the same name,—take Billing, by way of example,—scattered from north to south through all the local tribes. We have seen how this happens in America and Australia, we have seen that there the family, in Mr. Freeman's sense, does not grow into the clan. Did it do so in Attica and Italy, and, if so, how did a tribe, which was *ex hypothesi* but a swollen clan, contain so many stocks which claimed distinct origin and distinct mythical ancestors? How did these stocks come to be scattered through local tribes, not grouped in one? The growth of savage tribes is not a development of the family; tribes singularly like those of savages are found in early civilizations. Had the two kinds of kindred different origins?

There remains a point to notice. The thoroughly savage totem-kindreds revere the animal, plant, or other object from which they take their name and claim descent, and they use it as a badge. For Greek and Roman survivals of this usage see Plutarch, *Theseus;* M'Lennan, "The worship of plants and animals," in the *Fortnightly Review*, 1869, 1870; and the *Antiquities of Heraldry*, by W. S. Ellis, 1869. If the ordinary theory, that the tribe and clan are overgrown families, be rejected, the converse theory may be stated thus:—The totem-kindreds of savages grow up through exogamy and female kin. The change to male kinship (a change which is demonstrably taking place in America and Australia) produced something like the Chinese circle of relationship. The substitution of the name of a fictitious ancestor for that of the sacred plant, animal, or natural object produced a circle of affinity like the Hindu ghotra of customary religion.[1] The decay of the prohibition to marry within the kin united by the family name, like the growing laxity of rule in the ghotra, produced something like the Greek γένος and the Roman gens. Nothing remained but joint religious rites, a common place of burial, a common name, a vague feeling of connection, traditions of the prohibition to marry within the gens, the duty of taking up the blood-feud, and vestiges of the joint-heirship. In process of time the intenser affections of the family caused the old gentile ties to disappear, and gentile law became an empty memory.

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[1] We have examples in Zulu-land of the declining belief in animal ancestry (Callaway's *Religion of the Amazulu*), and in Greek history we have frequent instances of the fictitious adoption of eponymous heroic ancestors.

It has been shown that arrangements ruder than the modern family exist among contemporary savages, and have existed among ancient peoples. It has been shown that these rude institutions produce large associations of men, tribes and totem-kindred, among savages, and that, by a series of changes, every one of which is exemplified in experience, the Greek and Roman gentes, the units of early political society, may have been developed out of barbarous groups. There are next certain customs to be examined, which tend, as far as they go, to show that civilized society passed through savage stages. The chief of these customs are the ceremony of capture and bridal etiquette. As to the ceremony of capture it is superfluous to say much, as the subject has been handled, with complete originality and copious illustrations, in M'Lennan's *Primitive Marriage.* The classic example of the ceremony of capture is thus stated by C. O. Müller (*History and Antiquities of the Doric Race*, English translation, Oxford, 1830, vol. ii. p. 298): "Two things were requisite as an introduction and preparation to marriage at Sparta: first, betrothing on the part of the father; secondly, *the seizure of the bride.* The latter was clearly an ancient national custom." Müller then describes the clandestine intercourse, which lasted for some time, before the man "brought his bride, and frequently her mother, into his house." The intercourse of bride and groom among the Iroquois of Lafitau's time was likewise clandestine. For the practice in Crete Müller quotes Strabo, x. 482, D. A similar custom prevailed in Rome (Apuleius, *De As. Aur.* iv.; Festus, *s. v.* "Rapi"), and was supposed to be derived from the time of the rape of the Sabines. Mr. M'Lennan finds the practice necessary to the constitution of the relations of husband and wife among the Calmucks, the Tunguzians, the Khonds, the Fuegians, the Welsh, the Arabs, the Irish, and various other races. He explains its existence by the institutions of exogamy (*i.e.*, the rule prohibiting marriage between people of the same blood), and by the prevalence of hostility between the tribes of rude times. Suppose the rule to exist that a man may not marry a woman of his own community, and suppose that, by an exhaustive division, all other communities without exception are hostile, he *must* steal a wife if he is to marry at all. The fiction of capture, as men grow more polite, will endure as part of the marriage ceremony when the need of the reality is passed. It is to be noticed that the theft of the woman is, in the fictitious capture, generally the work of more than one man, as it well might be, if the early marriages were polyandrous. If it be granted that the prohibition to marry within the community is as early as it is widely prevalent, this explanation of the form of capture will seem sufficient. The origin of the early prohibition will be discussed later. Thus, on the evidence of a sportive feature in the marriage ceremony of civilized peoples, a vestige is revealed of customs connected with a very early form of the family.

A strange piece of barbarous etiquette may hint that the kindred of the bride and groom were once hostile groups. The daughter-in-law, among many races, is forbidden to speak to her father-in-law; the mother-in-law must hide when she sees her son-in-law. The wives treat their husbands with what may be a survival of hostility, and never name them by their names. Examples are collected in Sir John Lubbock's *Origin of Civilization*, pp. 11, 12. The practices are found among races on the border of the Polar Sea, in the Rocky Mountains, in Southern Africa, among the Caribs, Mongols, and Calmucks, in China, in Siberia, and in Australia. To these instances adduced by Sir John Lubbock we may add Bulgaria (Dozon, *Chants Populaires Bulgares*).

Herodotus says (i. 146) that the wives of the early Ionians would not call their husbands by their names nor sit at meat with them, and instructed their daughters to practise the same reserve. The reason assigned is that the women were originally Carians, whose parents the Ionians had slain. It may be allowed that this world-wide practice, too, testifies to a time when men married out of their own group, and all groups were hostile each to the other. Perhaps the English local custom, which forbids the parents of bride and bridegroom to be present at the marriage ceremony, holds the same antiquity.

We have now to note the widespread existence of a system of nomenclature, which can hardly have arisen in times when the monogamous family was the unit of society. Mr. Lewis Morgan of New York was the discoverer of a custom very important in its bearing on the history of society. In about two-thirds of the globe persons in addressing a kinsman do not discriminate between grades of relationship. All these grades are merged in large categories. Thus, in what Mr. Morgan calls the "Malayan system," "all consanguinei, near or far, fall within one of these relationships—grand-parent, parent, brother, sister, child, and grand-child." No other blood-relationships are recognized (*Ancient Society*, p. 385). This at once reminds us of the Platonic Republic. "We devised means that no one should ever be able to know his own child, but that all should imagine themselves to be of one family, and should regard as brothers and sisters those who were within a certain limit of age; and those who were of an elder generation they were to regard as parents and grand-parents, and those who were of a younger generation as children and grand-children (*Timæus*, 18, Jowett's translation, first edition, vol. ii., 1871). This system prevails in the Polynesian groups, and in New Zealand. Next comes what Mr. Morgan chooses to call the Turanian system. "It was universal among the North American aborigines," whom Mr. Morgan styles Ganowanians. "Traces of it have been found in parts of Africa" (*Ancient Society*, p. 386), and "it still prevails in South India among the Hindus, who speak the Dravidian language," and also in North India, among other Hindus. The system, as Mr. Morgan says, "is simply stupendous." It is not exactly the same among all his miscellaneous "Turanians," but, on the whole, assumes the following shapes. Suppose the speaker to be a male, he will style his nephew and niece in the male line, his brother's children, "son" and "daughter," and his grand-nephews and grand-nieces in the male line, "grandson" and "granddaughter." Here the Turanian and the Malayan systems agree. But change the sex; let the male speaker address his nephews and nieces in the female line,—the children of his sister,—he salutes them as "nephew" and "niece," and they hail him as "uncle." Now, in the Malay system, nephews and nieces on both sides, brother's children or sisters, are alike named "children" of the uncle. If the speaker be a female, using the Turanian style, these terms are reversed. Her sister's sons and daughters are saluted by her as "son" and "daughter," her brother's children she calls "nephew" and "niece." Yet the children of the persons thus styled "nephew" and "niece" are not recognized in conversation as "grand-nephew" and "grand-niece," but as "grandson" and "granddaughter." It is impossible here to do more than indicate these features of the classificatory nomenclature, from which the others may be inferred. The reader is referred for particulars to Mr. Morgan's great work, *Systems of Consanguinity and Affinity of the Human Race* (Washington, 1871).

The existence of the classificatory system is not an entirely novel discovery. Nicolaus Damascenus, one of the inquirers into early society, who lived in the first century of our era, noticed this mode of address among the Galactophagi. Lafitau found it among the Iroquois. To Mr. Morgan's perception of the importance of the facts, and to his energetic collection of reports, we owe our knowledge of the wide prevalence of the system. From an examination of the degrees of kindred which seem to be indicated by the "Malayan" and "Turanian" modes of address, Mr. Morgan has worked out a theory of the evolution of the modern family. A brief comparison of this with other modern theories will close our account of the family. The main points of the theory are shortly stated in *Systems of Consanguinity*, etc., pp. 487, 493, and in *Ancient Society*, p. 384. From the latter work we quote the following description of the five different and successive forms of the family:—

> "I. *The Consanguine Family.* It was founded upon the intermarriage of brothers and sisters, own and collateral, in a group.
>
> "II. *The Punaluan Family.* It was founded upon the intermarriage of several sisters, own and collateral, with each others' husbands, in a group,—the joint husbands not being necessarily kinsmen of each other; also, on the intermarriage of several brothers, own and collateral, with each others' wives in a group,—these wives not being necessarily of kin to each other, although often the case in both instances (*sic*). In each case the group of men were conjointly married to the group of women.
>
> "III. *The Syndyasmian or Pairing Family.* It was founded upon marriage between single pairs, but without an exclusive cohabitation. The marriage continued during the pleasure of the parties.

> "IV. *The Patriarchal Family.* It was founded upon the marriage of one man with several wives, followed in general by the seclusion of the wives.
>
> "V. *The Monogamian Family.* It was founded upon marriage between single pairs with an exclusive cohabitation.
>
> "Three of these forms, namely, the first, second, and fifth, were radical, because they were sufficiently general and influential to create three distinct systems of consanguinity, all of which still exist in living forms. Conversely, these systems are sufficient of themselves to prove the antecedent existence of the forms of the family and of marriage with which they severally stand connected."

Mr. Morgan makes the systems of nomenclature proofs of the existence of the Consanguine and Punaluan families. Unhappily, there is no other proof, and the same systems have been explained on a very different principle (M'Lennan, *Studies in Ancient History*, pp. 372–407). Looking at facts, we find the consanguine family nowhere, and cannot easily imagine how early groups abstained from infringing on each other, and created a systematic marriage of brothers and sisters. St. Augustine, however (*De Civ. Dei*, xv. 16), and Archinus in his *Thessalica* (*Odyssey*, xi. 7, scholia B, Q) agree more or less with Mr. Morgan. Next, how did the consanguine family change into the Punaluan? Mr. Morgan says (*Ancient Society*, pp. 424, 428) brothers ceased to marry their sisters, because "the evils of it could not for ever escape human observation." Thus the Punaluan family was hit upon, and "created a distinct system of consanguinity" (*Ancient Society*, p. 384), the Turanian. Again, "marriages in Punaluan groups explain the relationships in the system." But (p. 386) Mr. Morgan provides himself with another explanation, "the Turanian system owes its origin to marriage in the group *and* to the gentile organization." He calls exogamy "the gentile organization," though, in point of fact, the only gentes we know, the Roman gentes, show scarcely a trace of exogamy. Again, "the change of relationships which resulted from substituting Punaluan in the place of Consanguine marriage turns the Malayan into the Turanian system" (p. 442, see too p. 387). In the same page (442) Mr. Morgan attributes the change to the "gentile organization," and, still in the same page, uses *both* factors in his working out of the problem. Now, if the Punaluan marriage is a sufficient explanation, we do not need the "gentile organization." Both, in Mr. Morgan's opinion, were efforts of conscious moral reform. In *Systems of Consanguinity* (p. 490) the gentile organization (there called tribal), that is, exogamy, is said to have been "designed to work out a reformation in the intermarriage of brothers and sisters." But the Punaluan marriage had done that, otherwise it would not have produced (as Mr. Morgan says it did) the change from the Malayan to the Turanian system, the difference in the two systems, as exemplified in Seneca and Tamil, being "in the relationships which depended on the intermarriage or non-intermarriage of brothers and sisters" (*Ancient Society*, p. 442). Yet the Punaluan family, though itself a reform in morals and in "breeding," "did not furnish adequate motives to reform the Malay system," which, as we have seen, it did reform (p. 388). The Punaluan family, it is suspected, "frequently involved own brothers and sisters" (p. 427); had it not been so, there would have been no need of a fresh moral reformation,—"the gentile organization." Yet even in the Punaluan family (*Ancient Society*, p. 488) "brothers ceased to marry their own sisters." What, then, did the "gentile organization" do for men? As they had already ceased to marry their own sisters, and as, under the gentile organization, they were still able to marry their half-sisters, the reformatory "ingenuity" of the inventors of the organizations was at once superfluous and useless. It is impossible to understand the Punaluan system. Its existence is inferred from a system of nomenclature which it does (and does not) produce; it admits (and excludes) own brothers and sisters. Mr. Morgan has intended, apparently, to represent the Punaluan marriage as a long transition to the definite custom of exogamy, but it will be seen that his language is not very clear nor his positions assured. He does not adduce sufficient proof that the Punaluan family ever existed as an institution, even in Hawaii. There is, if possible, a greater absence of historical testimony to the existence of the Consanguine family. It is difficult to believe that exogamy was a conscious moral and social reformation, because, *ex hypothesi*, the savages had no moral data, nothing to cause disgust at relations which seem revolting to us. It is as improbable that they discovered the supposed physical evils of breeding in and in. That discovery could only have been made after a long experience, and in the Consanguine family that experience was impossible. Thus, setting moral reform aside as inconceivable, we cannot understand how the Consanguine families ever broke up. Mr. Morgan's ingenious speculations as to a transitional step towards the gens (as he calls what we style the totem-kindred), supposed to be found in the "classes" and marriage laws of the Kamilaroi, are vitiated by the weakness and contradictory nature of the evidence (see Pritchard, vol. ii. p. 492; Lang's *Queensland*, Appendix; *Proceedings of American Academy of Arts*, etc., vol. viii. 412; *Nature*, October 29, 1874). Further, though Mr. Morgan calls the Australian "gentile organization" "incipient," he admits (*Ancient Society*, p. 374) that the Narrinyeri have totem groups, in which "the children are of the clan of the father." Far from being "incipient," the gens of the Narrinyeri is on the footing of the ghotra of Hindu custom. Lastly, though Mr. Morgan frequently declares that the Polynesians have not the gens (for he thinks them not sufficiently advanced), Mr. Gill has shown that unmistakable traces of the totem survive in Polynesian mythology.

There is the less necessity to believe, with Mr. Morgan, in the Punaluan and Consanguine families, because the evidence on which he relies, the evidence of the classificatory system, has been explained on a different theory by Mr. M'Lennan (*Studies in Ancient History, loc. cit.*), whose mode of conceiving the evolution of the family is, briefly stated, this. Primitive man was, as geology reveals him, gregarious. We have no sort of evidence as to his truly primitive manners, for all existing savages have had many ages of experience and, as it were, of education. It can hardly be supposed, however, that the earliest men had instinct against marriage with near kin. Their earliest associations would be based on the sentiment of kindred, not yet brought into explicit consciousness, and on community of residence. They would be named by the name of their group. The blood relation of the mother to the child would be the first they perceived. As time went on they could reason out other relationships through women, but male kinship would remain, though not unknown as a fact, unrecognized in custom, because, if harmony was to exist within the group, it could only be secured "through indifference and promiscuity," which made certainty of male parentage impossible. Now let it be supposed, as a vast body of evidence leads us to suppose, that female children were slaughtered as *bouches inutiles*. The result would be a scarcity of women within the group. To secure wives men would be obliged to steal them from other groups, which were, *ex hypothesi*, hostile. This is almost the state of things known to Montaigne (Cotton's translation, chap. xvii.), "where the servile condition of women is looked upon with such contempt that they kill all the native females and buy wives from their neighbors." Now, in each group, by the system of capture, are members of alien groups, namely, the women and their children, who, as we have seen, are recognized as connexions of the mothers, not the fathers. Let these practices be formed into customary law, refuse a man permission to marry a woman of his own stock-name (marked by the totem), and you have exogamy, or what Mr. Morgan calls "the gentile organization." Within the groups are several families of the earliest type, the female and her offspring. Next, conceive of the sets of mother's sons, as feeling a stronger bond of union between themselves and the other members of the group, and as living with their mother. They cannot marry their sisters (who are of the same name and totem as themselves), but they regard their sisters' children as their heirs. To their own putative children they can only make presents *inter vivos*, and the sisters are wedded each to a set of men in the manner of the Nairs. But, as property was amassed, the brothers would prefer to keep their property in the hands of their putative children, and "there would be a disposition in favor of a system of marriage which would allow of the property passing to the brother's own children" (*Prim. Mar.*, 242). This form of marriage would be the one prevailing in Thibet. The elder brother, the first to marry, would have some of the attributes of the paterfamilias. Thus the idea of fatherhood attained something like maturity. Chiefs, moreover, would secure one or more wives to themselves, and their example imitated would produce monandry. The old state of things would leave its trace in the levirate, the duty of "raising up seed to a brother." Even before these changes the custom of marrying out of the group would have introduced so many strangers of various names and totems, that the members of a local tribe could intermarry with one another and yet not violate the law of exogamy. Such a local tribe, flushed with success in war, might refuse to marry beyond its limits, and become, so to say, a caste divided into ghotras. Let this caste feign itself to be descended from a common ancestor (a process of which Sir John Lubbock gives many examples), and you have a caste believed to be of common blood, yet refusing to marry outside the blood,—that is, an endogamous tribe. Within this tribe (as it were by a reaction from the old kinship through females) grows kinship through males only, the agnatic system of Rome. The wife and children are the husband's property; agnates only can be a man's heirs, and, failing these, gentiles,—*i. e.*, members of the kin still denoted by the common name.

Many criticisms have been made, especially by Sir John Lubbock and Mr. Herbert Spencer (*Origin of Civilization*, third edition; *Principles of Sociology*, vol. i.), on the scheme here too briefly sketched. Sir John Lubbock holds that exogamy springs from marriage by capture (by which alone a member of a group could get a wife to himself), rather than marriage by capture from exogamy. Mr. Spencer advocates the action of various "conspiring causes," "the stealing of a wife might become the required proof of fitness to have one" (*op. cit.*, pp. 652, 653). The origin of exogamy lies so far behind us in the past that it may remain for ever obscure. It is probable that every variety of union of the sexes has existed, while it seems possible that a few have been passed through, as necessary stages, by all advancing races. In this notice we have said little of the custom by which a man is a member of several clubs of men, each with one wife in common.

No hard and fast theory is likely to be accepted as more than provisional in the present state of knowledge, when science has only for a few years been busily occupied in this investigation. (A. L.)

FAMINES. War, pestilence, and famine are regarded by many as the natural enemies of the human race; but in truth these are all more or less associated with the circumstances of civilization. In the highest state of civilized society there ought to be no war; there need be no pestilence; and famine alone would stand as being beyond the range of human prevention—subject to some conditions to be afterwards spoken of. The advancement in the social scale to a state of dependence upon cereal crops, while the facilities of intercommunication between different countries, or even parts of the same country, remained imperfect, led almost necessarily to the periodical recurrence of scarcity. Cereal crops are especially dependent upon conditions of climate for their regular production; and here at least are circumstances beyond human control.

In a matter of such practical importance as the failure of the regular supply of the food of the people, it is not desirable to rely upon merely theoretical surmises; nor is it necessary to do so. A table has recently been prepared[1] of over 350 famines which have occurred in the history of the world, beginning with those spoken of in the Scriptures as having been in Palestine and in the neighboring nations in the time of Abraham (Gen. xii. 10), and again in the time of Isaac (Gen. xxvi. 1); passing on to the seven years' famine in Egypt down through those which afflicted ancient Rome; enumerating in their order those which have visited the three divisions of the United Kingdom (by far the most numerous in the table—the records being more available), as also those devastating Europe in the Middle Ages; reviewing in special detail the 34 famines which have visited India, including, as the first recorded of this group, that of 1769–70 (above 20 have been on a large scale); and concluding with that terrible calamity which is now ravaging the populations in North China. It is not pretended that this table is entirely exhaustive. It is known that many famines have occurred in the Chinese empire of which no details have been found available; and it is supposed that many have desolated Persia and other portions of Asia of which exact particulars are not available. But as this is believed to be the only existing table of the kind, and as great pains have been taken to make it complete, it may for our present purpose be regarded at least as representative. We proceed, then, to an analysis of it, in view of ascertaining what have been the causes of famines,—a point of the first importance when we come to a consideration of the problem which will naturally force itself into prominence—can anything be done to avert these national calamities?

The analysis discloses the following causes, or we may perhaps more accurately say attributed causes—for in this matter we have to follow the authority of the original chronicle, or of such records as have reached us:—1, rain; 2, frost; 3, drought; 4, other meteorological phenomena; 5, insects and vermin; 6, war; 7, defective agriculture; 8, defective transport; 9, legislative interference; 10, currency restrictions; 11, speculation; 12, misapplication of grain. These causes are named, as far as may be, in the order of their importance. It is immediately noticeable that they form themselves into the two distinct groups of natural and artificial causes.

We proceed to consider the first group—*natural causes of famines.*

1. *Rain.*—By excess of rain floods are produced, the soil becomes saturated, and decomposition of the seed is occasioned. In hilly countries the seed is not unfrequently washed entirely out of the ground, and so is destroyed. This cause of famine applies in a marked manner to tropical countries, where the rains are so much of the nature of torrents that the evil presents itself in a magnified degree. Improved cultivation of the land, embracing good drainage, is providing the most effective remedy. Other forms of damage to grain crops result from rain, as where it occurs in undue quantities during the harvest season, and the crops are destroyed before they can be safely stored. This has constantly happened in the northern portions of our own kingdom, and in parts of continental Europe. Inundations from the sea, from rivers, from inland lakes, fall within this category, and great mischief has resulted from these in many parts of the world. White, in his *Natural History of Selborne*, gives scientific reasons why much-flooded lands remain infertile—the beneficial action of the earth-worms is thereby retarded.

2. *Frost.*—In temperate regions frost is a deadly enemy to vegetation in several forms. In the case of grain cultivation it may, by setting in early, prevent the efficient manipulation of the soil and the sowing of the autumn seed. Or by being protracted beyond the early months of the year, it will prevent spring sowing, and even seriously injure the young crops. Combined with rain it will frequently destroy the vitality of the seed while yet in the ground. In the northern part of our island it not unfrequently destroys the grain before it is fully harvested. Efficient drainage of the soil is almost as effective against the ravages of frost as against the damage from rain. Many famines in Great Britain have been shown to be directly the result of frost. In France, and other wine and olive producing countries, the damage occasioned by frost is immense. Such damage, as well as that occasioned by floods, is there a recognized branch of insurance business.

3. *Drought.*—In all climates of a tropical character drought plays an important part in retarding the development of vegetation. When combined with moisture, solar heat affords the most certain means of securing luxuriance; without the moisture there is absolute sterility. The early Bible records refer to the rising of the waters of the Nile as the event upon which the fertility of Egypt depends. About 1060 the overflowing of this great river failed for seven successive years, occasioning one of the greatest famines of history. Two provinces were wholly depopulated; and in another half the inhabitants perished. Even in temperate climates long-continued drought is very disastrous.

4. *Other Meteorological Phenomena.*—Under this general designation has to be included several causes more or less directly or remotely contributing to famines. (*a*) *Comets.*—The appearance of these has often coincided with periods of drought; they are also frequently associated with excessive heat. But heat, except in so far as it may superinduce drought, is not detrimental to the grain crops; while, in relation to fruit crops, and more especially that of the vine, not only is the quality of the produce greatly

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[1] See *Statistical Journal*, vol. xli., paper by Mr. Cornelius Walford, F.I.A., F.S.S., etc., "On the Famines of the World, past and present."

enhanced, but frequently its quantity also. The sale of some of the comet-claret of 1811 recently at £12, 10s. per bottle in Paris is some evidence of the quality. (*b*) *Earthquakes.*—These would seem to have but little influence in producing famine, except in the immediate locality of their devastations. Where, however, they have produced irruptions of the sea or inland waters, which has not unfrequently been the case, the damage has been extensive. (*c*) *Hurricanes and Storms.*—These frequently produce widespread injury in the localities they visit. They also lead to irruptions of the sea, and to the overflow of rivers; but as a rule these occur at periods of the year when the grain and other crops are not sufficiently advanced to sustain serious damage by shaking or otherwise, or have been harvested. (*d*) *Hail-storms.*—These are usually local in their effects—rarely extending beyond 60 miles in their greatest length and some 6 miles in width, and are generally confined to much smaller limits. They are most destructive to grain and fruit produce of all kinds when they occur in severe form, and in the summer and autumn months—when they are most prevalent. The damage these occasion has long been the subject of insurance alike in England and other parts of Europe. In France hail-storms are of great frequency, and also of great severity.

5. *Insects, Vermin, etc.*—Insect plagues appear to have afflicted mankind from a very early period. Thus flies and locusts were among the plagues of Egypt, and concerning the latter we read (Ex. x. 14, 15): "Very grievous were they; before them there were no such locusts as they, neither after them shall be such. For they covered the face of the whole earth, so that the land was darkened; and they did eat every herb of the land, and all the fruit of the trees which the hail had left; and there remained not any green in the trees, or in the herbs of the field, through all the land of Egypt." The present writer travelled in 1874 through districts in the Western States of America devastated very much in the manner thus described. The famine now raging in North China began in one district at least by a visitation of locusts. In India such visitations have occurred several times. England has been visited on various occasions by plagues of insects, especially in 476 and again in 872. As to vermin, such as rats, mice, etc., destroying the crops, there are but few instances on record. In 1581 there was a plague of mice in Essex, and in 1812–13 a plague of rats in the Madras presidency, which in part occasioned the famine of that year.

We now turn to the *artificial causes* of famines, some of which hardly admit of being dealt with in the same detail.

6. *War.*—Warfare has a tendency to create famine in one or other of several forms. It too frequently retards cultivation, either by its direct operation, or indirectly by calling the agricultural classes to arms. By its agency, too, the crops of whole districts are either designedly destroyed or ruinously devastated. Famines in particular towns or localities are often occasioned by the establishment of blockades, or through supplies being otherwise intercepted or cut off. A large quantity of grain, too, is probably damaged every year by being kept in military stores in various parts of Europe; in the event of famine, however, these stores may become of immense value.

7. *Defective Agriculture.*—This may result from one of several causes, as ignorance, indifference, or unsuitability of climate or location. Where the produce of the soil but barely meets the current requirements of the inhabitants, it is clear that either the failure of one season's crops, or the sudden influx of any great number of strangers, may produce at least temporary famine. See Macaulay's *England*, vol. i. chap. 3, or Wade's *British History chronologically arranged*, under date 1549 to 1553, etc.

8. *Defective Transport.*—This may arise from such causes as bad roads or want of roads, absence of canals or want of shipping, or from wilful obstruction. In our own country we had the advantage of the great Roman roads from a very early period; but still for cross country purposes the roads remained very bad, or, indeed, did not exist, until comparatively recent times. In 1285 an Act was passed for widening the highways from one market town to another; "but this was intended rather to prevent robbery than to facilitate travelling" (Wade). In consequence of the bad state of the roads it has frequently happened that there was a famine prevailing in one part of the kingdom, with a superabundance of food in another. The introduction of canals, and subsequently of railroads, removed all possible difficulty in the United Kingdom. In India at the present moment the chief difficulty in connection with the famines is the want of the means of transport.

9. *Legislative Interference.*—It does not appear altogether certain whether legislative interference with respect to the import or export of grain originated in relation to the prevention of famines, or in the desire to advance agriculture or to keep down prices within the limits at one time prescribed by law. Probably all these causes contributed to the building up of the system of the Corn Laws, which were only repealed, at the indignant demand of the nation, as recently as 1846. It is clear that all legislative interference must be designed to interfere with the natural course of supply and demand; and to that extent it is dangerous. There is no doubt that the Corn Laws were often called into play to prevent exportation of grain; while they only admitted of its importation when prices reached or exceeded certain predetermined limits. It was the Irish famine of 1845–46 which at least hastened their final repeal.[1]

10. *Currency Restrictions.*—Under this head is mainly included the consideration of debasing the coin, and so lessening its purchasing power. But for very direct testimony on more than one occasion we should hardly have included this among the causes of famine. Thus Penkethman (who may be regarded as a high authority) says, under date 1124, "By means of changing the coine all things became very deere, whereof an extreme famine did arise, and afflict the multitude of the people unto death." Other instances, as in 1248, 1390, and 1586, are more particularly set out in the table of famines already referred to.

11. *Speculation.*—Under this head has chiefly to be considered that class of dealings known as "forestalling," "ingrossing," and trafficking by "regratours." Offences of this character were prohibited by statute in 1552 (5 and 6 Edward VI. c. 14), and it is seen that much importance was attached to them. Then there was the Act of 1555 (2 and 3 Philip and Mary, c. 15), "An Act that purveyors shall not take victuals within 5 miles of Cambridge and Oxford," on account of the poor estate of the multitude of scholars "having very bare and small sustentation." A further inquiry into the legislative measures taken in this direction would show how little removed from famine conditions were the people of England even at a comparatively recent period.

12. *Misapplication of Grain.*—Under this head is mainly to be noted the excessive use of grain in brewing and distilling, and by burning, whether wilfully or by misadventure. The laws regarding the burning of grain ricks were long and properly very severe, the punishment being capital until within a comparatively recent date. Under date 1315 we find it recorded that the Londoners, "considering that wheat was much consumed by the converting thereof into mault, ordained that from thence it was to be made of other grains." This order was afterwards extended by the king (Edward II.) through the whole kingdom. In later times distilling from grain has been prohibited.

It is clear from what has thus been said that the specific causes of famines which are denominated artificial have nearly all passed away, so far as Britain is concerned; but some of them still assert their force, especially in the East. As to India, the constantly recurring famines in the various provinces have caused great commiseration in England, and much anxiety and cost to the Government,—that of 1874 costing £6,500,000, that of 1877 nearly £10,000,000,—and have naturally drawn attention to the fact that the Indian empire, as a whole, produces year by year sufficient food for its aggregate population. The food supply fails at certain points; and there are no adequate means of transportation between the suffering provinces and others which have abundance. Hence millions starve; and hence, in the mean time, has arisen a fierce controversy between those who are in favor of canals, and water carriage generally, and the military authorities, who regard railways as of the first necessity—funds not being immediately forthcoming for both purposes.

There are other facts regarding the famines of India which require to be known, as they are contrary to the general belief. Thus Mr. F. C. Danvers says, in his able *Report on the Famines of India* (1878):—

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[1] Edward I. "caused the wooll and leather to be stayed in England, and there followed great dearth of corne and wine."—Penkethman.

> "Famines in India have arisen from several different causes, but the most general cause has not been the failure of the usual rains. Distress has also, however, been caused by hostile invasion, by swarms of rats and locusts, by storms and floods, and not unfrequently by the immigration of the starving people from distant parts into districts otherwise well provided with food supplies, and occasionally by excessive exports of grain into famine-stricken districts, or by combinations of two or more of the above-mentioned circumstances."

Another point may be mentioned, which bears, not only upon the famines of India, but upon those of other countries where they are occasioned by deficiency of rain, or by too much rain, viz., the effect produced on the average rainfall by denuding a country of its growing timber. There can be no doubt that the rainfall in England has been much lessened by the continuous destruction of our forests and even of our hedgerows. In India the cutting down of timber for the purpose of supplying fuel to the locomotive engines on the railways has already produced noticeable effects. The authorities are happily alive to the fact, and remedial measures are already being taken. But other results are produced by the same cause. The testimony of the French forest department in the Hautes and Basses Alpes is strong, and reaches the practical question of floods and the damage they occasion. "So great indeed were the devastations from which these alpine districts suffered through the denudation of the mountain sides, and the consequent formation of torrents, that intervention of the most prompt description became necessary to prevent the destruction, not only of the grazing grounds themselves, but of the rich valleys below them." The replanting of these mountains had been going on for some time. "Already the beneficial effect of what has been done is felt in the diminution of the violence of the torrents. . . . During the present summer (1875), when so much mischief has been done in the south of France by inundations, the Durance, which rises in the mountains east of Avignon, and which, on former occasions, has been the worst and most dangerous of all the rivers in the south of France, on account of the inundations it has caused, has scarcely been heard of; and it is around the head waters of this river that the chief plantation works have, during the last ten years, been carried on."[1]

In connection with famines the "sun-spot" theory of rainfall has of late engaged much attention. The basis of this theory is that all the phenomena connected with the sun ebb and flow once in eleven years, and that from the relation of the earth to the sun these maximum and minimum periods regulate terrestrial phenomena. The sun's energy "gives us our meteorology by falling at different times upon different points of the aërial and aqueous envelopes of our planet, thereby producing ocean and air currents; while, by acting upon the various forms of water which exist in those envelopes, it is the fruitful parent of rain, and cloud, and mist. Nor does it stop here. It affects in a more mysterious way the electricity in the atmosphere, and the magnetism of the globe itself."[2] So far, however, as the tables illustrating the theory admit of comparison with the list of famines already referred to—and the tables extend to the rainfall (as indicated by floods), to frosts, to drought, and to other meteorological phenomena—there is no present evidence that such a theory can be upheld, even when applied to the famines of India only; and apparently still less when extended to those of the whole world. As to Mr. Jeula's tables of shipwrecks, which appear to follow the eleven years' theory, and to which the doctrine of recurrent storms, induced by the meteorological influences already named, has been applied—the explanation may be traced to other influences, such as mercantile depression, etc.

It remains to be added that to the direct influence of famines we owe our Poor Laws—that national system of insurance against starvation. "In the 29th yeare of Queen Elizabeth, about January [1586], Her Majesty observing the general Dearthe of Corne and other victual, groune partly through the unseasonablenesse of the year then passed, and partly through the uncharitable greediness of the Corne-Masters, but especially through the unlawful and over much transporting of graine in forreine parts; by the advice of Her most Hon. Privy Council, published a Proclamation, and a Booke of Orders to be taken by justices for reliefe of the Poore; notwithstanding all which the excessive prices of grain still encreased: so that wheate was sold at London for 8s. the Bushel, and in some other parts of the Realme above that price."—Penkethman. To the famine in India in 1781–3 was due the institution of the *Monegar Choultry*, or the Indian equivalent to the British Poor Law; while in connection with the Indian famine of 1790–2 was introduced the system of Government relief works, so extensively adopted at the time of the Irish famine of 1846–7 and the Lancashire cotton famine of 1861–5. The first recorded importation of grain into Great Britain took place during the great famine of 1258, when "fifty of shiploads of wheat, barley, and bread were procured from Germany"—hence the first incident which, at a later date, gave rise to our Corn Laws; and in many other ways famines have left their mark upon our history and our institutions. (C. W.)

FAN (Latin, *vannus;* French, *éventail*), a light implement used for giving motion to the air. *Ventilabrum* and *flabellum* are names under which ecclesiastical fans are mentioned in old inventories. Fans for cooling the face have been in use in hot climates from remote ages. A bas-relief in the British Museum represents Sennacherib with female figures carrying feather fans. They were attributes of royalty along with horse-hair fly-flappers and umbrellas. Examples may be seen in plates of the Egyptian sculptures at Thebes and other places, and also in the ruins of Persepolis. In the museum of Boulak, near Cairo, a wooden fan handle showing holes for feathers is still preserved. It is from the tomb of Amen-hotep, of the 18th dynasty, 17th century B.C. In India fans were also attributes of men in authority, and sometimes sacred emblems. A heart-shaped fan, with an ivory handle, of unknown age, and held in great veneration by the Hindus, was given to the prince of Wales. Large punkahs or screens, moved by a servant who does nothing else, are in common use by Europeans in India at this day.

Fans were used in the early Middle Ages to keep flies from the sacred elements during the celebrations of the Christian mysteries. Sometimes they were round, with bells attached—of silver, or silver gilt. Notices of such fans in the ancient records of St. Paul's, London, Salisbury cathedral, and many other churches, exist still. For these purposes they are no longer used in the Western church, though they are retained in some Oriental rites. The large feather fans, however, are still carried in the state processions of the supreme pontiff in Rome, though not used during the celebration of the mass. The fan of Queen Theodolinda (7th century) is still preserved in the treasury of the cathedral of Monza. Fans made part of the bridal outfit, or *mundus muliebris*, of ancient Roman ladies.

Folding fans had their origin in Japan, and were imported thence to China. They were in the shape still used—a segment of a circle of paper pasted on a light radiating frame-work of bamboo, and variously decorated, some in colors, others of white paper on which verses or sentences are written. It is a compliment in China to invite a friend or distinguished guest to write some sentiment on your fan as a memento of any special occasion, and this practice has continued. A fan that has some celebrity in France was presented by the Chinese ambassador to the Comtesse de Clauzel at the coronation of Napoleon I. in 1804. When a site was given in 1635, on an artificial island, for the settlement of Portuguese merchants in Nippo in Japan, the space was laid out in the form of a fan as emblematic of an object agreeable for general use. Men and women of every rank both in China and Japan carry fans, even artisans using them with one hand while working with the other. In China they are often made of carved ivory, the sticks being plates very thin and sometimes carved on both sides, the intervals between the carved parts pierced with astonishing delicacy, and the plates held together by a ribbon. The Japanese make the two outer guards of the stick, which cover the others, occasionally of beaten iron, extremely thin and light, damascened with gold and other metals.

Fans were used by Portuguese ladies in the 14th century, and were well known in England before the close of the reign of Richard II. In France the inventory of Charles V. at the end of the 14th century mentions a folding ivory fan. They were brought into general use in that country by Catherine de' Medici, probably from Italy, then in advance of other countries in all matters of personal luxury. The court ladies of Henry VIII.'s reign in England were used to handling fans. A lady in the Dance of Death by Holbein holds a fan. Queen Elizabeth is painted with a round feather fan in her portrait at Gorhambury; and as many as twenty-seven are enumerated in her inventory (1606). Coryat, an English traveller, in 1608 describes them as common in Italy. They also became of general use from that time in Spain. In Italy, France, and Spain fans had special conventional uses, and various actions in handling them grew into a code of signals, by which ladies were supposed to convey hints or signals to admirers or to rivals in society. A paper in the *Spectator* humorously proposes to establish a regular drill for these purposes.

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[1] See *Proceedings of the Forest Conference held at Simla* (India), October, 1875.

[2] "Sun-Spots and Famines," by J. Norman Lockyer and W. W. Hunter, in *Nineteenth Century*, Nov., 1877, p. 583.

The chief seat of the European manufacture of fans during the 17th century was Paris, where the sticks or frames, whether of wood or ivory, were made, and the decorations painted on mounts of very carefully prepared vellum (called latterly *chicken skin*, but not correctly),—a material stronger and tougher than paper, which breaks at the folds. Paris makers exported fans unpainted to Madrid and other Spanish cities, where they were decorated by native artists. Many were exported complete; of old fans called Spanish a great number were in fact made in France. Louis XIV. issued edicts at various times to regulate the manufacture. Besides fans mounted with parchment, Dutch fans of ivory were imported into Paris, and decorated by the heraldic painters in the process called "Vernis Martin," after a famous carriage painter and inventor of colorless lac varnish. Fans of this kind belonging to the Queen and to the late baroness de Rothschild were exhibited in 1870 at Kensington. A fan of the date of 1660, representing sacred subjects, is attributed to Philippe de Champagne, another to Peter Oliver in England in the 17th century. Cano de Arevalo, a Spanish painter of the 17th century, devoted himself to fan painting. Some harsh expressions of Queen Christina to the young ladies of the French court are said to have caused an increased ostentation in the splendor of their fans, which were set with jewels and mounted in gold. Rosalba Carriera was the name of a fan painter of celebrity in the 17th century. Lebrun and Romanelli were much employed during the same period. Klingstet, a Dutch artist, enjoyed a considerable reputation for his fans from the latter part of the 17th and the first thirty years of the 18th century.

The revocation of the edict of Nantes drove many fan-makers out of France to Holland and England. The trade in England was well established under the Stuart sovereigns. Petitions were addressed by the fan-makers to Charles II. against the importation of fans from India, and a duty was levied upon such fans in consequence. This importation of Indian fans, according to Savary, extended also to France. During the reign of Louis XV. carved Indian and China fans displaced to some extent those formerly imported from Italy, which had been painted on swanskin parchment prepared with various perfumes.

During the 18th century all the luxurious ornamentation of the day was bestowed on fans as far as they could display it. The sticks were made of mother-of pearl or ivory, carved with extraordinary skill in France, Italy, England, and other countries. They were painted from designs of Boucher, Watteau, Lancret, and other "genre" painters. Hébert, Rau, Chevalier, Jean Boquet, Mad. Verité, are known as fan painters. These fashions were followed in most countries of Europe, with certain national differences. Taffeta and silk, as well as fine parchment, were used for the mounts. Little circles of glass were let into the stick to be looked through, and small telescopic glasses were sometimes contrived at the pivot of the stick. They were occasionally mounted with the finest point lace. An interesting fan (belonging to Madame de Thiac in France), the work of Le Flamand, was presented by the municipality of Dieppe to Marie Antoinette on the birth of her son the dauphin. From the time of the Revolution the old luxury expended on fans died out. Fine examples ceased to be exported to England and other countries. The painting on them represented scenes or personages connected with political events. At a later period fan mounts were often prints colored by hand. The events of the day mark the date of many examples found in modern collections. Amongst the fan-makers of the present time the names of Alexandre, Duvelleroy, Fayet, Vanier, may be mentioned as well known in Paris. The sticks are chiefly made in the department of Oise, at Le Déluge, Crèvecœur, Méry, Ste. Geneviève, and other villages, where whole families are engaged in preparing them; ivory sticks are carved at Dieppe. Water-color painters of distinction often design and paint the mounts, the best designs being figure subjects. A great impulse has been given to the manufacture and painting of fans in England since the exhibition which took place at South Kensington in 1870. Other exhibitions have since been held, and competitive prizes offered, one of which was gained by the Princess Louise. Modern collections of fans take their date from the emigration of many noble families from France at the time of the Revolution. Such objects were given as souvenirs, and occasionally sold by families in straitened circumstances. A large number of fans of all sorts, principally those of the 18th century, French, English, German, Italian, Spanish, etc., have been lately bequeathed to the South Kensington Museum.

Regarding the different parts of folding fans it may be well to state that the sticks are called in French *brins*, the two outer guards *panaches*, and the mount *feuille*. (J. H. P.)

FANO, a city of Italy in the province of Urbino-e-Pasaro, is situated in a rich and fertile plain on the shores of the Adriatic, at the mouth of the Metauro, 7 miles S.E. of Pesaro. The town is clean and well built, and is inclosed by old walls, with a lofty bastioned front towards the sea. Its cathedral is an unimposing structure, but some of the churches are fine buildings, richly adorned with marbles and frescoes, and containing several masterpieces of the great Italian painters. In the church of S. Francesco are the splendid tombs of the Malatestas. Fano has a Jesuit college, several monastic edifices, a gymnasium, a public library, and a large and finely adorned theatre. The harbor is so choked up with sand as to be accessible only to vessels of the smallest size. Some silk manufactures and a small trade in corn and oil are carried on, and the town is much resorted to for sea-bathing. The population in 1871 was 6439.

Fano occupies the site of the ancient *Fanum Fortunæ*, so named from the temple of Fortune there. It afterwards took the name of *Colonia Julia Fanestris*, from a colony of veterans established by Augustus; and a triumphal arch of white marble erected in honor of that emperor still forms one of the gates of the city. Though the town was within the duchy of Urbino it did not belong to the dukes, but was successively held by the Malatesta and the Sforza families, till in 1458 Pius II. incorporated it with the States of the Church. Fano is the birthplace of Clement VIII. It was there that the first printing press with movable Arabic types was established, in 1514, at the expense of Pope Julius II.

FANSHAWE, Sir Richard (1608–1666), poet and statesman, was the youngest son and tenth child of Sir Henry Fanshawe, remembrancer of the exchequer under James I. He was born early in June, 1608, at Wareham Park, Hertfordshire. At the age of seven he lost his father, and was soon placed by his mother under the care of the famous schoolmaster, Thomas Farnabie. In November, 1623, he was admitted fellow commoner of Jesus College, Cambridge, under Dr. Beale. In January, 1626, he entered the Middle Temple, but his mother dying soon after, and the study of the law being distasteful to him, he travelled in France and Spain, learning the languages of those countries, and observing the customs of the people. On his return, in 1635, he was appointed secretary to the English embassy at Madrid under Lord Aston, and was resident there until Sir Arthur Hopton's appointment in 1638. As soon as the civil war broke out he very prominently joined the Royalist party, being at this time on terms of somewhat affectionate intimacy with Charles I. In 1644, being with the court at Oxford, he had the degree of D.C.L. conferred upon him, and the same year he was appointed secretary at war to the prince of Wales, with whom he set out for the western counties, Scilly, and then Jersey. It was during this stormy period that Fanshawe first appeared as a poet: in 1647 he published his translation of the *Pastor Fido* of Guarini, the remaining copies of which he re-issued in 1648 with the addition of a number of other poems, original and translated. In 1648 his attention was again directed to public affairs by his appointment as treasurer to the navy under Prince Rupert, which he held till the latter was forced, in 1650, to escape to the West Indies. Fanshawe then proceeded to Paris, where he was created baronet, and sent to Madrid as envoy extraordinary. He was, however, immediately afterwards sent for to Scotland, but was captured on the way at the battle of Worcester in 1651. He was sent to London, and kept in such close confinement that his health broke down; but Cromwell, finding that he was really dangerously ill, allowed him to choose a place of residence, with the proviso that he was not to stir from it more than 5 miles. It was during his captivity that he published, in 1652, his *Selected Parts of Horace, Prince of Lyricks*, a very graceful work, in which he keeps as close as possible to the metrical form of the *Odes*. He chose to retire to Tankerley Park, in Yorkshire, the seat of Lord Strafford, and gave himself up entirely to literature. In 1654 he completed translations of two of the comedies of the Spanish poet Antonio de Mendoza, which were published after his death, in 1671, under the title of *Querer per solo querer: to Love only for Love's Sake, and Fiestas de Aranjuez*. But the great labor of his retirement was the translation of the national epic of the Portuguese poet Camoens. This version of the *Lusiad* was printed in folio in 1655, with very fine engravings. It is in ottava rima, and there is prefixed to it a translation of the long Latin poem entitled *Furor Petroniensis*, which forms an episode in the *Satyricon*. Moreover, in 1658 Fanshawe published a Latin version of the *Faithful Shepherdess* of Fletcher, and a letter dedicating the unprinted translations of Mendoza's plays to the queen of Sweden. In February, 1659, he broke through his bail, and joined Charles II. at Breda; he was enthusiastically received and loaded with promises. But when the Restoration was complete he did not, to his great disappointment, find himself made secretary of state. In 1661 he represented the university of Cambridge in parliament, and was presently sent out to Portugal as envoy extraordinary; he was shortly after appointed ambassador to the same court, and negotiated the marriage between Charles II. and the Infanta. At the end of the year he returned to England, only to be sent out as ambassador to Lisbon again in 1662. In 1663 he was recalled to be sworn one of his majesty's privy council. In the beginning of 1644 he was sent as ambassador to Philip IV. of Spain, and arrived at Cadiz in February of that year, to receive such an ovation as no English envoy had ever before enjoyed. During the whole of 1665 he was engaged in very delicate diplomatic relations between England, Portugal, and Spain; and in January, 1666, he travelled to Lisbon in the endeavor to bring about a peace between the last-mentioned powers. But he had scarcely returned to Madrid when he was somewhat peremptorily recalled to England. It is not known whether this affected his health, but at all events he fell ill at Madrid, and died there, after a short illness, on the 26th of June, 1666. His widow, Lady Fanshawe, drew up a charming memoir of her husband, which was first printed in 1829. To this circumstance and to his public position we owe the fact that of no poet of his age do we possess more copious materials for biography than of Fanshawe. He was a very tall courtly man, with short curling brown hair, and fine eyes. As an original poet we have very little means of judging his merit; a fine "Ode upon occasion of his Majesty's Proclamation in 1630," and some rough, but richly-colored sonnets, are the best of his own verses which have come down to us. But as a translator he is one of the illustrious figures in our literature, whether Italian, Latin, Portuguese, or Spanish attracts his versatile muse. His *Pastor Fido* and his *Lusiad* have never been surpassed by later scholars. As a verse-writer his chief fault is ruggedness; his active life gave him but scant opportunity for revision. His letters were edited in 1724 and since, but no collected edition of his works has ever been issued.

FARADAY, Michael, chemist, electrician, and philosopher, was born at Newington, Surrey, 22d September, 1791, and died at Hampton Court, 25th August, 1867. His parents had migrated from Yorkshire to London, where his father worked as a blacksmith. Faraday himself became apprenticed to Mr. Riebau, a book-binder. The letters written to his friend Benjamin Abbott at this time give a lucid account of his aims in life, and of his methods of self-culture, when his mind was beginning to turn to the experimental study of nature. In 1812 Mr. Dance, a customer of his master, took him to hear four lectures by Sir Humphry Davy. Faraday took notes of these lectures, and afterwards wrote them out in a fuller form. Under the encouragement of Mr. Dance, he wrote to Sir H. Davy, enclosing these notes. "The reply was immediate, kind, and favorable." He continued to work as a journeyman book-binder till 1st March, 1813, when, at the recommendation of Sir H. Davy, he was appointed assistant in the laboratory of the Royal Institution of Great Britain. He was appointed director of the laboratory 7th February, 1825; and in 1833 he was appointed Fullerian professor of chemistry in the Institution for life, without the obligation to deliver lectures. He thus remained in the Institution for 54 years. He accompanied Sir H. Davy in a tour through France, Italy, Switzerland, Tyrol, Geneva, etc., from October 13, 1813, to April 23, 1815.

Faraday's earliest chemical work was in the paths opened by Davy, to whom he acted as assistant. He made a special study of chlorine, and discovered two new chlorides of carbon. He also made the first rough experiments on the diffusion of gases, a phenomenon first pointed out by Dalton, the physical importance of which has been more fully brought to light by Graham and Loschmidt. He succeeded in liquefying several gases; he investigated the alloys of steel, and produced several new kinds of glass intended for optical purposes. A specimen of one of these heavy glasses afterwards became historically important as the substance in which Faraday detected the rotation of the plane of polarization of light when the glass was placed in the magnetic field, and also as the substance which was first repelled by the poles of the magnet. He also endeavored with some success to make the general methods of chemistry, as distinguished from its results, the subject of special study and of popular exposition. See his work on *Chemical Manipulation.*

But Faraday's chemical work, however important in itself, was soon completely overshadowed by his electrical discoveries. The first experiment which he has recorded was the construction of a voltaic pile with seven halfpence, seven disks of sheet zinc, and six pieces of paper moistened with salt water. With this pile he decomposed sulphate of magnesia (first letter to Abbott, July 12, 1812). Henceforward, whatever other subjects might from time to time claim his attention, it was from among electrical phenomena that he selected those problems to which he applied the full force of his mind, and which he kept persistently in view, even when year after year his attempts to solve them had been baffled.

His first notable discovery was the production of the continuous rotation of magnets and of wires conducting the electric current round each other. The consequences deducible from the great discovery of Örsted (21st July, 1820) were still in 1821 apprehended in a somewhat confused manner even by the foremost men of science. Dr. Wollaston indeed had formed the expectation that he could make the conducting wire rotate on its own axis, and in April, 1821, he came with Sir H. Davy to the laboratory of the Royal Institution to make an experiment. Faraday was not there at the time, but coming in afterwards he heard the conversation on the expected rotation of the wire.

In July, August, and September of that year Faraday, at the request of Mr. Phillips, the editor of the *Annals of Philosophy*, wrote for that journal an historical sketch of electro-magnetism, and he repeated almost all the experiments he described. This led him in the beginning of September to discover the method of producing the continuous rotation of the wire round the magnet, and of the magnet round the wire. He did not succeed in making the wire or the magnet revolve on its own axis. This first success of Faraday in electro-magnetic research became the occasion of the most painful, though unfounded, imputations against his honor. Into these we shall not enter, referring the reader to the *Life of Faraday*, by Dr. Bence Jones.

We may remark, however, that although the fact of the tangential force between an electric current and a magnetic pole was clearly stated by Örsted, and clearly apprehended by Ampère, Wollaston, and others, the realization of the continuous rotation of the wire and the magnet round each other was a scientific puzzle requiring no mean ingenuity for its original solution. For on the one hand the electric current always forms a closed circuit, and on the other the two poles of the magnet have equal but opposite properties, and are inseparably connected, so that whatever tendency there is for one pole to circulate round the current in one direction is opposed by the equal tendency of the other pole to go round the other way, and thus the one pole can neither drag the other round and round the wire, nor yet leave it behind. The thing cannot be done unless we adopt in some form Faraday's ingenious solution, by causing the current, in some part of its course, to divide into two channels, one on each side of the magnet, in such a way that during the revolution of the magnet the current is transferred from the channel in front of the magnet to the channel behind it, so that the middle of the magnet can pass across the current without stopping it, just as Cyrus caused his army to pass dryshod over the Gyndes by diverting the river into a channel cut for it in his rear.

We must now go on to the crowning discovery of the induction of electric currents.

In December, 1824, he had attempted to obtain an electric current by means of a magnet, and on three occasions he had made elaborate but unsuccessful attempts to produce a current in one wire by means of a current in another wire or by a magnet. He still persevered, and on the 29th August, 1831, he obtained the first evidence that an electric current can induce another in a different circuit. On September 23 he writes to his friend, R. Phillips—"I am busy just now again on electro-magnetism, and think I have got hold of a good thing, but can't say. It may be a weed instead of a fish that, after all my labor, I may at last pull up." This was his first successful experiment. In nine more days of experimenting he had arrived at the results described in his first series of "Experimental Researches" read to the Royal Society, November 24, 1841.

By the intense application of his mind he had brought the new idea, in less than three months from its first development, to a state of perfect maturity. The magnitude and originality of Faraday's achievement may be estimated by tracing the subsequent history of his discovery. As might be expected, it was at once made the subject of investigation by the whole scientific world, but some of the most experienced physicists were unable to avoid mistakes in stating, in what they conceived to be more scientific language than Faraday's, the phenomena before them. Up to the present time the mathematicians who have rejected Faraday's method of stating his law as unworthy of the precision of their science have never succeeded in devising any essentially different formula which shall fully express the phenomena without introducing hypotheses about the mutual action of things which have no physical existence, such as elements of currents which flow out of nothing, then along a wire, and finally sink into nothing again.

After nearly half a century of labor of this kind, we may say that, though the practical applications of Faraday's discovery have increased and are increasing in number and value every year, no exception to the statement of these laws as given by Faraday has been discovered, no new law has been added to them, and Faraday's original statement remains to this day the only one which asserts no more than can be verified by experiment, and the only one by which the theory of the phenomena can be expressed in a manner which is exactly and numerically accurate, and at the same time within the range of elementary methods of exposition.

During his first period of discovery, besides the induction of electric currents, Faraday established the identity of the electrification produced in different ways; the law of the definite electrolytic action of the current; and the fact, upon which he laid great stress, that every unit of positive electrification is related in a definite manner to a unit of negative electrification, so that it is impossible to produce what Faraday called "an absolute charge of electricity" of one kind not related to an equal charge of the opposite kind.

He also discovered the difference of the capacities of different substances for taking part in electric induction, a fact which has only in recent years been admitted by continental electricians. It appears, however, from hitherto unpublished papers that Henry Cavendish had before 1773 not only discovered that glass, wax, rosin, and shellac have higher specific inductive capacities than air, but had actually determined the numerical ratios of these capacities. This, of course, was unknown both to Faraday and to all other electricians of his time.

The first period of Faraday's electrical discoveries lasted ten years. In 1841 he found that he required rest, and it was not till 1845 that he entered on his second great period of research, in which he discovered the effect of magnetism on polarized light, and the phenomena of diamagnetism.

Faraday had for a long time kept in view the possibility of using a ray of polarized light as a means of investigating the condition of transparent bodies when acted on by electric and magnetic forces. Dr. Bence Jones (*Life of Faraday*, vol. i., p. 362) gives the following note from his laboratory book, 10th September, 1822:—

> "Polarized a ray of lamp-light by reflection, and endeavored to ascertain whether any depolarizing action (was) exerted on it by water placed between the poles of a voltaic battery in a glass cistern; one Wollaston's trough used; the fluids decomposed were pure water, weak solution of sulphate of soda, and strong sulphuric acid; none of them had any effect on the polarized light, either when out of or in the voltaic circuit, so that no particular arrangement of particles could be ascertained in this way."

Eleven years afterwards we find another entry in his notebook on 2d May, 1833 (*Life*, by Dr. Bence Jones, vol. ii. p 29). He then tried, not only the effect of a steady current but the effect on making and breaking contact.

> "I do not think, therefore, that decomposing solutions or substances will be found to have (as a consequence of decomposition or arrangement for the time) any effect on the polarized ray. Should now try non-decomposing bodies, as solid nitre, nitrate of silver, borax, glass, etc., whilst solid, to see if any internal state induced, which by decomposition is destroyed, *i. e.*, whether, when they cannot decompose, any state of electrical tension is present. My borate of glass good, and common electricity better than voltaic."

On May 6 he makes further experiments, and concludes—"Hence I see no reason to expect that any kind of structure or tension can be rendered evident, either in decomposing or non-decomposing bodies, in insulating or conducting states."

Experiments similar to the last-mentioned have recently been made by Dr. Kerr of Glasgow, who considers that he has obtained distinct evidence of action on a ray of polarized light when the electric force is perpendicular to the ray and inclined 45° to the plane of polarization. Many physicists, however, have found themselves unable to obtain Dr. Kerr's result.

At last, in 1845, Faraday attacked the old problem, but this time with complete success. Before we describe this result we may mention that in 1862 he made the relation between magnetism and light the subject of his very last experimental work. He endeavored, but in vain, to detect any change in the lines of the spectrum of a flame when the flame was acted on by a powerful magnet.

This long series of researches is an instance of his persistence. His energy is shown in the way in which he followed up his discovery in the single instance in which he was successful. The first evidence which he obtained of the rotation of the plane of polarization of light under the action of magnetism was on the 13th September, 1845, the transparent substance being his own heavy glass.

He began to work on August 30, 1845, on polarized light passing through electrolytes. After three days he worked with common electricity, trying glass, heavy optical glass, quartz, Iceland spar, all without effect, as on former trials. On September 13 he worked with lines of magnetic force. Air, flint, glass, rock-crystal, calcareous spar, were examined but without effect.

> "Heavy glass was experimented with. It gave no effects when the *same magnetic poles* or the *contrary* poles were on opposite sides (as respects the course of the polarized ray), nor when the same poles were on the same side either with the constant or intermitting current. But when contrary magnetic poles were on the same side there was an effect produced on the polarized ray, and thus magnetic force and light were proved to have relations to each other. This fact will most likely prove exceedingly fertile, and of great value in the investigation of the conditions of natural force."

He immediately goes on to examine other substances, but with "no effect," and he ends by saying, "Have got enough for to-day." On September 18 he "does an excellent day's work." During September he had four days of work, and in October six, and on 6th November he sent in to the Royal Society the nineteenth series of his "Experimental Researches," in which the whole conditions of the phenomena are fully specified. The negative rotation in ferro-magnetic media is the only fact of importance which remained to be discovered afterwards (by Verdet in 1856).

But his work for the year was not yet over On November 3 a new horseshoe magnet came home, and Faraday immediately began to experiment on the action in the polarized ray through gases, but with no effect. The following day he repeated an experiment which had given no result on October 6. A bar of heavy glass was suspended by silk between the poles of the new magnet. "When it was arranged, and had come to rest, I found I *could* affect it by the magnetic forces and give it position." By the 6th December he had sent in to the Royal Society the twentieth, and on 24th December the twenty-first, series of his "Researches," in which the properties of diamagnetic bodies are fully described. Thus these two great discoveries were elaborated, like his earlier one, in about three months.

The discovery of the magnetic rotation of the plane of polarized light, though it did not lead to such important practical applications as some of Faraday's earlier discoveries, has been of the highest value to science, as furnishing complete dynamical evidence that wherever magnetic force exists there is matter, small portions of which are rotating about axes parallel to the direction of that force.

We have given a few examples of the concentration of his efforts in seeking to identify the apparently different forces of nature, of his far-sightedness in selecting subjects for investigation, of his persistence in the pursuit of what he set before him, of his energy in working out the results of his discoveries, and of the accuracy and completeness with which he made his final statement of the laws of the phenomenon.

These characteristics of his scientific spirit lie on the surface of his work, and are manifest to all who read his writings. But there was another side of his character, to the cultivation of which he paid at least as much attention, and which was reserved for his friends, his family, and his church. His letters and his conversation were always full of whatever could awaken a healthy interest, and free from anything that might rouse ill-feeling. When, on rare occasions, he was forced out of the region of science into that of controversy, he stated the facts, and let them make their own way. He was entirely free from pride and undue self-assertion. During the growth of his powers he always thankfully accepted a correction, and made use of every expedient, however humble, which would make his work more effective in every detail. When at length he found his memory failing and his mental powers declining, he gave up, without ostentation or complaint, whatever parts of his work he could no longer carry on according to his own standard of efficiency. When he was no longer able to apply his mind to science, he remained content and happy in the exercise of those kindly feelings and warm affections which he had cultivated no less carefully than his scientific powers.

The parents of Faraday belonged to the very small and isolated Christian sect which is commonly called after Robert Sandeman. Faraday himself attended the meetings from childhood; at the age of thirty he made public profession of his faith, and during two different periods he discharged the office of elder. His opinion with respect to the relation between his science and his religion is expressed in a lecture on mental education delivered in 1854, and printed at the end of his *Researches in Chemistry and Physics.*

> "Before entering upon the subject, I must make one distinction which, however it may appear to others, is to me of the utmost importance. High as man is placed above the creatures around him, there is a higher and far more exalted position within his view; and the ways are infinite in which he occupies his thoughts about the fears, or hopes, or expectations of a future life. I believe that the truth of that future cannot be brought to his knowledge by any exertion of his mental powers, however exalted they may be; that it is made known to him by other teaching than his own, and is received through simple belief of the testimony given. Let no one suppose for an instant that the self-education I am about to commend, in respect of the things of this life, extends to any considerations of the hope set before us, as if man by reasoning could find out God. It would be improper here to enter upon this subject farther than to claim an absolute distinction between religious and ordinary belief. I shall be reproached with the weakness of refusing to apply those mental operations which I think good in respect of high things to the very highest. I am content to bear the reproach. Yet even in earthly matters I believe that 'the invisible things of Him from the creation of the world are clearly seen, being understood by the things that are made, even His eternal power and Godhead;' and I have never seen anything incompatible between those things of man which can be known by the spirit of man which is within him and those higher things concerning his future, which he cannot know by that spirit."

Faraday gives the following note as to this lecture:—

> "These observations were delivered as a lecture before His Royal Highness the Prince Consort and the members of the Royal Institution on the 6th of May, 1854. They are so immediately connected in their nature and origin with my own experimental life, considered either as cause or consequence, that I have thought the close of this volume not an unfit place for their reproduction."

As Dr. Bence Jones concludes—

> "His standard of duty was supernatural. It was not founded on any intuitive ideas of right and wrong, nor was it fashioned upon any outward experiences of time and place, but it was formed entirely on what he held to be the revelation of the will of God in the written word, and throughout all his life his faith led him to act up to the very letter of it."

Published Works.—Chemical Manipulation, being Instructions to Students in Chemistry, 1 vol., John Murray, 1st edition 1827, 2d 1830, 3d 1842; *Experimental Researches in Electricity*, vols. i. and ii., Richard and John Edward Taylor, vols. i. and ii., 1844 and 1847; vol. iii., 1844; vol. iii., Richard Taylor and William Francis, 1855; *Experimental Researches in Chemistry and Physics*, Taylor and Francis, 1859; *Lectures on the Chemical History of a Candle* (edited by W. Crookes), Griffin, Bohn & Co., 1861; *On the Various Forces in Nature* (edited by W. Crookes), Chatto and Windus (no date).

Biographies.—Faraday as a Discoverer, by John Tyndall, Longmans, 1st edition 1868, 2d edition 1870; *The Life and Letters of Faraday*, by Dr. Bence Jones, secretary of the Royal Institution, in 2 vols., Longmans, 1870; *Michael Faraday*, by J. H. Gladstone, Ph.D., F.R.S., Macmillan, 1872. (J. C. M.)

FARCE. See DRAMA.

FAREHAM, a market-town of England, county of Hants, situated at the N.W. extremity of Portsmouth harbor, 73 miles by road and 84 by the South-Western Railway from London. The town consists chiefly of one wide street, and during the summer months is much resorted to for sea-bathing. It has a handsome assembly-room and other conveniences requisite for such places. The principal industries are the manufacture of sackings, ropes, coarse earthenware, terra-cotta, tobacco pipes, and leather. Fareham has a considerable trade in corn, timber, and coal. The population in 1871 was 7023.

FAREL, GUILLAUME (1489-1565), a celebrated French Reformer, was born near Gap in Dauphiny in 1489. He was of noble descent, and it was the wish of his parents that he should adopt the military profession, but the pursuit of knowledge proved so attractive to him that he characteristically determined to have his own way, and succeeded in obtaining permission to enter the university of Paris. Here he became the intimate friend of Jacobus Faber (Stapulensis), from whom in all probability he imbibed his first doubts regarding many of the usages and customs of the Roman Catholic Church. Through the introduction of Faber he was appointed professor to the college of Cardinal Lemoine, but not long afterwards, on the invitation of Bishop Briçonnet, he went to Meaux to assist Faber and others in preaching the doctrine of the Reformation. He was, however, compelled to leave France by the outbreak of the persecution of 1523, and went to Basel, where, in 1524, he defended the Reformation doctrines in a public disputation with great ability, but with such acrimonious keenness that Erasmus sided with the opponents of the Reformation in requiring his expulsion from the city. From Basel he went to Strasburg, and thence, on the invitation of the duke of Würtemberg, to Montbéliard, where he preached for a time with great success; but since, as usual, he forgot to temper his zeal with discretion, he was compelled to leave the town in the spring of 1525. He shortly afterwards began his Reformation crusade at Aigle in Switzerland, and notwithstanding the strenuous opposition of the monks, he, in 1528, obtained permission from the authorities to preach in any place within the canton of Bern. He also extended his itineracies to the cantons of Neufchâtel and Vaud, and although often seriously maltreated by the mobs whom he provoked by his violent invectives, continued his crusade in these districts with unabated zeal till 1531, when increasing manifestations of hostility rendered it imperative that he should seek another sphere for his labors. In that year, accordingly, he paid a short visit to the Waldenses, after which he went to Geneva, where he began to hold meetings of the Reformers in his private house. On this account he was summoned to appear before the bishop's vicar, and after being frequently insulted and threatened, during the progress of his trial, by the monks and canons, who drowned his defence by their clamor, he was rudely and violently pushed out of the court, and was commanded to leave the town within three hours. Escaping with great difficulty from the fury of his opponents, he went by sea to Orbe. In 1533, however, he returned to Geneva under the protection of the Government of Bern, and so successful were his sermons and his public disputations that in August, 1535, the town renounced the authority of the pope, and the simple worship of the Reformation was instituted in the churches. About this time Calvin visited Geneva, and Farel—whose superabounding zeal seems to have exercised a kind of spell over the calmer spirit of the great theologian—prevailed on him to give up all thoughts of a life of quiet study, and to devote himself to the cause of the Reformation in Geneva. Leaving Geneva to the care of Calvin, Farel returned to his work of itinerant preaching, chiefly in Neufchâtel, where, although the violent hostility of the priests and women showed no signs of diminution, he attracted large audiences, and gained a considerable number of adherents. At intervals he visited Geneva, over whose ecclesiastical affairs he seems to have exercised a kind of supervision; but the strictness of his doctrines and discipline gradually provoked the opposition of many of the inhabitants, and in 1538 he and Calvin were banished from the town. Farel went to Strasburg, and afterwards, in 1542, to Metz, where he labored with his usual energy and want of discretion, and with the usual mingled results. In 1541 Calvin was permitted to return to Geneva, and although Farel visited the town only at long intervals, he seems to have been consulted by Calvin in all important matters. When the trial of Servetus was in progress Farel was earnestly entreated by Calvin to be present before the case was finally decided, but he did not arrive until after the sentence of condemnation had been passed. He, however, accompanied the unhappy man to the place of execution, and continued until the last moment his exhortations to him to renounce his errors. About 1558 Farel married a young girl, and the marriage was the occasion of a quarrel between him and Calvin. Farel continued his labors with unabated zeal and vigor till 1565. In that year he visited Metz, where he had an enthusiastic reception, and preached with all his old fire and eloquence; but after returning to the house where he was residing, he was overpowered by exhaustion, from which he never rallied, dying on the 13th September. Farel wrote a considerable number of works, but as these were all thrown off in haste, and merely for a temporary purpose, it is scarcely fair to make them the criterion by which to estimate his powers as a thinker or theologian. His nature was, however, rather practical than meditative, the most remarkable features of his character being his dauntlessness and his untiring energy and zeal, in which respects he is perhaps to be ranked second to none of the Reformers with the exception of Luther, if he is to be considered second even to him. He possessed all but the greatest qualities of an orator, a sonorous and tuneful voice, appropriate gesture, fluency of language, and passionate earnestness. But although seldom failing to awaken the attention and interest of his large audiences, he often, by imprudent torrents of denunciation, aroused against his doctrines unnecessary opposition; and it would be difficult to determine whether, on the whole, the cause of the Reformation gained or lost by his advocacy. A monument to Farel was unveiled at Neufchâtel on the 4th of May, 1876.

See Ancillon, *Vie de Guillaume Farel*, Amster. 1691; Kirchhofer, *Das Leben Wilhelm Farel's*, 2 vols., Zurich, 1831–33; Schmidt, *Études sur Farel*, Stras. 1834; and Schmidt, *Wilhelm Farel and Peter Viret*, Elberfeld, 1860.

FARIA Y SOUSA, Manoel de (1590–1649), a Spanish and Portuguese historian and poet, was born of an ancient Portuguese family, probably at Pombiero, attended for several years at the university of Braga, and when about fourteen entered the service of the bishop of Oporto. With the exception of about four years (1630–1634), during which he held the post of ambassador to the papal court, the greater part of his later life was spent at Madrid, and there he died, after long-continued sufferings, on 3d June, 1649. He was a laborious, peaceful man; and a happy marriage with Catharina Machado, the Albania of his poems, enabled him to lead a studious domestic life, dividing his cares and affections between his children and his books. His first important work, an *Epitome de las historias Portuguezas*, Madrid, 1628, was favorably received; but some passages in his enormous *Commentary on the Lusiad* (2 vols., Madrid, 1639) excited the suspicion of the inquisitors, caused his temporary incarceration, and led to the permanent loss of his official salary. In spite of the enthusiasm which is said to have prescribed to him the daily task of twelve folio pages, death overtook him before he had completed his greatest enterprise—a history of the Portuguese in all parts of the world. Several portions of the work appeared at Lisbon posthumously, under the editorship of Captain Faria y Sousa:—*Europa Portugueza*, 1667, 3 vols.; *Asia Portugueza*, 1666, 1674, and 1675, 3 vols.; *Africa Portugueza*, 1681. As a poet Faria y Sousa was nearly as prolific; but his poems are vitiated by the prevailing Gongorism of his time. They were for the most part collected in the *Fuente de Aganipe*, of which four volumes were published at Madrid in 1644–46. A series of "Moral Dialogues," as the author intended to have called them, obtained from the publisher the fantastic title of the "Brilliant Nights"—*Noches Claras, Primera Parte*, 1624.

FARIDKOT, a feudatory state of North-Western India, under the political superintendency of the government of the Punjab, situated between 30° 40′ and 30° 56′ N. lat., and between 74° 22′ and 75° 9′ E. long. It is bounded on the W. and N.E. by the British district of Firozpur, and on the S. by Nábhá State. Area, 600 square miles; estimated population, 68,000; estimated revenue, £30,000. The rájá's military force consists of 200 cavalry, 600 infantry and police, and 3 field-guns. During the Sikh wars in 1845 the chief exerted himself in the English cause, and was rewarded with the title of Rájá, and an increase of territory. In the mutiny of 1857, too, he did good service by guarding the Sutlej ferries, and in attacking a notorious rebel, whose stronghold he destroyed.

FARIDPUR, or Furreedpore, a district of British India, in the Dacca division of Bengal, lies in 22° 47′ 53″–23° 54′ 55″ N. lat., and in 89° 21′ 50″–90° 16′ 0″ E. long. It is bounded on the N. and E. by the Ganges or Padmé river, separating it from Pubna and Dacca districts; on the W. by the Chandná and Madhumati rivers, separating it from Jessor; and on the S. by Bákarganj. The general aspect of the district is flat, tame, and uninteresting, although in the northern tract the land is comparatively high, with a light sandy soil, covered with water during the rainy season, but dry during the cold and hot weather. From the town of Farídpur the ground slopes, until in the south, on the confines of Bákarganj, it becomes one immense swamp, never entirely dry. During the height of the inundations the whole district may be said to be under water. The villages are built on artificially raised sites, or the high banks of the deltaic streams. Along many of the larger rivers the line of hamlets is unbroken for miles together, so that it is difficult to say where one ends and another begins. The huts, however, except in markets and bazaars, are seldom close together, but are scattered amidst small garden-plots and groves of mango, date, and betel-nut trees. The plains between the villages are almost invariably more or less depressed towards the centre, where usually a marsh, or lake, or deep lagoon is found. These marshes, however, are gradually filling up by the silt deposited from the rivers. In the north of the district there now only remain two or three large swamps, and in them the process may be seen going on. The climate of Farídpur is damp, like that of the other districts of Eastern Bengal; the average annual rainfall is 85·42 inches, and the average mean temperature 76·9° F.

The principal rivers of Farídpur are the Ganges, the Ariál Khán, and the Madhumati. The Ganges, or Padmá as it is locally called, touches the extreme north-west corner of the district, flows along its northern boundary as far as Goálandá, where it receives the waters of the Jamuna or main stream of the Brahmaputra, and whence the united stream turns southwards and forms the eastern boundary of the district. At the confluence of the two great rivers the current is so strong and the eddies and whirlpools so numerous, that the most powerful river steamers proceeding up stream during the flood season are often unable to make headway, and have to lie for days at Goálandá point until the river subsides. The Padmá is navigable by the largest cargo boats and river steamers throughout the year, its channel being estimated at an average of 1600 yards. The Ariál Khán is the principal branch of the Padmá. It takes off from the right bank of the parent stream a few miles below Farídpur town, and runs a south-easterly and southerly course till it leaves the district and flows into Bákarganj. The river is navigable by large cargo boats throughout the year, and has an average breadth during the rainy season of 1600 yards. The third great water-channel is the Madhumati (a continuation of the Garái branch of the Padmá), which forms the western boundary of the district. These rivers, but particularly the Padmá, are subject to constant alluvial changes on a large scale, and to repeated alterations in their course.

Rice, the great crop of the district, is divided into four distinct species, each with many minor varieties. These are—the *aman* or winter rice, which forms the principal harvest, and is the great staple of export; the *áus* or autumn rice; and the spring *boro* and *ráida* rice, both grown in swamps and deep water, and forming the common food of the people. The other cereal crops are wheat, barley, oats, and Indian corn; pulses, oilseeds, vegetables, fibres, sugar-cane, date-palms, indigo, safflower, betel-leaf, comprise the remaining important agricultural products. The area of the district, prior to recent changes of boundary, was 1506 square miles, of which 1143 were returned in 1871 as under cultivation, 133 as uncultivated but capable of tillage, and 230 as uncultivable. More than one-half of the whole cultivated area is under rice. The only natural calamity to which the district is subject to any serious extent arises from floods, which occasionally cause a general destruction of the crops. The three principal lines of road in Farídpur are the Calcutta and Jessor imperial road, 19 miles in length; Farídpur and Kálínagar road, 16 miles; Farídpur and Tálmá road, 10 miles. The Eastern Bengal Railway runs for 22 miles from west to east through the north of the district, having its terminus at Goálandá, at the junction of the Padmá and Jamuna rivers.

The census of 1872 showed a population of 1,012,589, 497,854 males and 514,735 females, inhabiting 2307 villages and 157,518 houses. The Mahometans number 588,299, or 58·1 per cent. of the whole; the Hindus, 420,988, or 41·6 per cent.; Christians, 463; and "others," 2839. The material condition of the population has considerably improved of late years, owing to the increase of tillage and the general rise in prices of agricultural products. Two towns contain a population exceeding 5000, viz.—(1) Farídpur, the chief town and administrative headquarters of the district: population in 1872, 8593; municipal revenue, £319, 3s. 7d.; expenditure, £213, 19s. 2d.; and (2) Sayyidpur: population, 6324; municipal revenue, £91, 4s. 9d.; expenditure, £136, 3s. 2d. The other towns or villages of importance as places of trade are—Bhángá, on the Kumár; Gopálganj, on the Madhumati; Boálmári, on the Barásiá; Madhukhálí and Betangá, on the Chándná; Kanáipur, on the Kumár; and Goálandá, on the Padmá.

The district has rapidly advanced in prosperity under British administration, especially of late years. In 1844–45 the total net revenue amounted to £9616, and the expenditure to £6004; in 1870–71 the net revenue was £58,868, and the expenditure £25,013. The land revenue, which in 1850 amounted to £3803 paid by 448 proprietors, had increased in 1870–71 to £27,263, derived from 3126 proprietors. The regular police force consisted in 1871 of 341 officers and men, costing £6425. A small municipal force of 20 men is kept up in the municipal towns of Farídpur and Sayyidpur. The rural police consisted in 1871 of 2026 men, and cost £7658, contributed by the landholders and villages. The schools in 1872–73 numbered 176, with 6497 pupils.

FARINA, or PORTO FARINA, a town of the regency of Tunis, at the mouth of the Madjerda (the ancient Bagradas), about 15 miles E. of Bizerta or Binzert. It lies in a very fruitful district, and was at one time the naval arsenal of Tunis; but its harbor has become very shallow, in all probability by the elevation of the coast, and its importance has consequently declined. The ruins on the west side of the river are identified with the ancient Utica. Quicksilver is obtained from the neighboring promontory. Population about 9000.

FARINATO, PAOLO (1522–1606), a painter and architect, was a native of Verona. He is sometimes named Farinato degli Uberti, as he came from the ancient Florentine stock to which the Ghibelline leader Farinata degli Uberti, celebrated in Dante's *Commedia*, belonged. He flourished at the same time that the art of Verona obtained its greatest lustre in the works of Paolo Cagliari (Paul Veronese), succeeded by other members of the Cagliari family, of whom most or all were outlived by Farinato. He was instructed by Niccolò Giolfino, and probably by Antonio Badile and Brusasorci. Proceeding to Venice, he formed his style partly on Titian and Giorgione, though he was never conspicuous as a colorist, and in form he learned more from the works of Giulio Romano. His nude figures show knowledge of the antique; he affected a bronzed tone in the complexions, harmonizing with the general gravity of his color, which is more laudable in fresco than in oil-painting. Vasari praised his thronged compositions and merit of draughtsmanship. His works are to be found, not only in Venice and principally in Verona, but also in Mantua, Padua, and other towns belonging or adjacent to the Venetian territory. He was a prosperous and light-hearted man, and continually progressed in his art, passing from a comparatively dry manner into a larger and bolder one, with much attraction of drapery and of landscape. The Miracle of the Loaves and Fishes, painted in the church of S. Giorgio in Verona, is accounted his masterpiece; it was executed at the advanced age of seventy-nine, and is of course replete with figures, comprising those of the painter's own family. A saloon was painted by him in S. Maria in Organo, in the same city, with the subjects of Michael expelling Lucifer, and the Massacre of the Innocents; in Piacenza is a St. Sixtus; in the Berlin gallery a Presentation in the Temple; and in the communal gallery of Verona one of his prime works, the Marriage of St. Catherine. Farinato executed some sculptures, and various etchings of sacred and mythologic subjects; his works of all kinds were much in request, including the wax models which he wrought as studies for his painted figures. He is said to have died at the same hour as his wife. His son Orazio was also a painter of merit.

FARINELLI (1705–1782), whose real name was CARLO BROSCHI, one of the most extraordinary singers that ever lived, was born January 24, 1705, at Naples (Burney), or according to Sacchi, his biographer, at Andria. Having been prepared for the career of a sopranist, he soon acquired a voice the beauty of which has never been surpassed, under the instruction of the celebrated Porpora. He became famous, while yet a boy, throughout southern Italy, where he was usually called *il ragazzo;* and in 1722 he made his *début* in "Eomene," written by his master, at Rome, where he created the greatest astonishment by vying with a celebrated German trumpet-player in holding and swelling a note of prodigious length and power. In 1724 he appeared at Vienna, and at Venice in the following year, and returned to Naples shortly afterwards. He sang at Milan in 1726, and in 1727 at Bologna, where he met for the first time the great artist, Bernacchi, to whose instruction he was indebted for some of his subsequent improvement. After revisiting Vienna, Farinelli, with ever-increasing success and fame, appeared in nearly all the great cities of Italy; and he returned a third time to Vienna in 1731. Here he received from Charles VI. a piece of sound criticism and kindly advice, which led him to acquire a pathos in his singing which he had not till then possessed, having hitherto always adhered to the florid, *bravura* style peculiar to the school of Porpora. After making another tour of the Italian cities he came to London in 1734, arriving here in time to lend his powerful support to the faction which had just set up an opposition to Handel; but not even his aid could make the undertaking successful, though he was assisted by Porpora and the celebrated Senesino. Having spent three years in England, Farinelli, loaded with presents, set out for Spain, staying a few months by the way in France, where he sang before Louis XV., and was rewarded with a handsome snuff-box containing the king's portrait set in diamonds, and 500 louis d'or. In Spain, where he had only meant to stay a few months, he ended by passing nearly twenty-five years. His voice, used by the queen to cure Philip V. of his melancholy madness, acquired for him, through the success of the treatment, an influence with that prince which gave him eventually the power, if not the name, of prime minister. This power he was wise and modest enough to use discreetly; and he always conciliated the enemies whom his favor raised up against him. He had, however, to pay for his position a price which to every artist must seem too heavy,—that of singing night after night to the king the same six songs, and never anything else. Under Ferdinand VI. he held the same place, and was decorated with the cross of Calatrava. He utilized his ascendency over this king by persuading him to establish an Italian opera. While at Madrid he heard of the death of Bernacchi, of whom he speaks in terms of affection and esteem in an extant letter addressed to the Padre Martini. Returning to Bologna, Farinelli spent the remainder of his days there in a melancholy splendor, and died July 15, 1782, aged 77. His voice was of large compass, possessing seven or eight notes more than those of ordinary singers, and was sonorous, equal, and clear; and he also possessed a great knowledge of music.

FARINI, Luigi Carlo (1812–1866), an Italian physician, statesman, and historian, was born at Russi in Ravenna, 22d October, 1812. After completing a brilliant university course at Bologna, he practised as a physician at Ravenna and at Russi. By his successful treatment of various diseases, and his communications to the Bolognese *Bollettino delle scienze mediche* and other scientific journals, he soon acquired a considerable reputation, but in 1843 his political opinions brought him under the suspicion of the police, and caused his expulsion from the Papal States. He then resided successively at Marseilles, Paris, Florence, and Turin, taking advantage of the facilities afforded him in each place to perfect his medical skill; but by the amnesty granted by Pius IX. on the 16th July, 1846, he was permitted to return to the States, and he received soon afterwards the professorship of clinical surgery at Osimo. In 1845 he published a pamphlet on the cultivation of rice in Italy. In 1847 he was induced to take advantage of an opportunity which then presented itself of entering political life, and became under secretary of state, holding office, however, for little more than a month, since, along with his colleagues, he disapproved of the policy of the pope in siding with Austria against the Italian states. Elected in 1848 member of the reformed parliament for Faenza, he was named director general of health and prisons, but refusing to adhere to the proclamation of a republic, he resigned the office in February, 1849, and passed into Tuscany. When the French army entered Rome in the following July he resumed his office, but the triumvirate of cardinals who governed in the name of the pope having compelled him, soon after his return, to go again into exile, he took up his residence at Turin, where he published a satirical paper *La Frusta*, contributed to the *Risorgimento*, and wrote the first part of his chief historical work *Storia dello stato Romano dal anno 1815 al 1850*, which he published in 1850. In the same year he was named by the Sardinian Government member of the upper council of health; and in 1851 he was appointed minister of public instruction, an office which he held till May, 1852. As a member of the Sardinian parliament, and as proprietor and editor of a political journal, *Il Piemonte*, Farini was one of the most influential supporters of the policy of Cavour, and in 1859 he was sent by the latter on a political mission to Parma and Modena. On the flight of the duke of Modena in June, 1859, Farini was entrusted with the provisional government of the town, in which capacity he negotiated the annexation of the duchy to Piedmont. The same year saw the publication of the second volume of his *Storia*. In June, 1860, he was named by Cavour minister of the interior, but resigned the office on the death of Cavour in June of the following year. On the 8th December, 1862, he succeeded Rattazzi as president of the cabinet, in which office he endeavored to carry out the policy inaugurated by Cavour. Over-exertion, however, brought on softening of the brain, which compelled him to resign his office 24th March, 1863, and ultimately resulted in his death at Quarto, near Genoa, 1st August, 1866. His remains, originally buried at Turin, were in 1878 removed to his native town of Russi, and monuments to his memory have been erected both there and at Ravenna.

Several letters addressed by Farini to Mr. Gladstone and Lord John Russell, on the affairs of Italy, were reprinted in the appendix to a *Mémoire sur les Affaires d'Italie*, 1859, and a collection of his political correspondence was published at Paris in 1860, under the title *Lettres sur les Affaires d'Italie*. His historical work was translated into English, the first part by Mr. Gladstone, and the second by a lady under his superintendence. A French translation of the work appeared in 1862. See Ettori Parri, *Luigi Carlo Farini: Commemorazione*, Rome, 1878.

FARMER, Hugh (1714–1787), an English theologian, was born in the neighborhood of Shrewsbury in 1714. About 1730 he entered the theological academy at Northampton taught by Dr. Doddridge, and on completing his studies he was appointed to a charge at Walthamstow in Essex, officiating at the same time as chaplain to a wealthy gentleman in the neighborhood in whose house he lived. He soon, however, resigned his chaplaincy, and took up his residence in the house of another member of his congregation, where he continued to live till his removal to London in 1761, on his acceptance of an invitation to become the afternoon preacher at Salter's Hall. There he was also soon afterwards appointed one of the Tuesday lecturers. He died 5th February, 1787.

His first work of importance was published in 1761, under the title of *An Inquiry into the Nature and Design of our Lord's Temptation in the Wilderness*, and was designed to prove that the temptation of Jesus took place only in vision, and was a prefiguration of his future life and ministry. In 1771 appeared his *Dissertation on Miracles, designed to show that they are Arguments of a Divine Interposition, and absolute Proofs of the Mission and Doctrine of a Prophet.* In 1775 he published an *Essay on the Demoniacs of the New Testament*, and in 1783 a treatise entitled *The General Prevalence of the Worship of Human Spirits in the Ancient Heathen Nations asserted and proved.* See *Memoirs of Hugh Farmer*, edited by Michael Dodson, 1804.

FARMER, Richard (1735–1797), the Shakespearian commentator, was born at Leicester in 1735. He was educated first at the free grammar school of his native town, and afterwards at Emmanuel College, Cambridge, of which in 1760 he became classical tutor, and in 1775 master, in succession to Dr. Richardson, the biographer of the English bishops. In the latter year also he was appointed vice-chancellor, and three years afterwards chief librarian of the university. In 1780 he was appointed to a prebendal stall in Lichfield, and in about two years more to one at Canterbury; but the second office he exchanged in 1788 for that of a canon residentiary of St. Paul's. Cambridge, where he usually resided, was indebted to him for improvements in lighting, paving, and watching; but perhaps London and the nation have less reason to be grateful for his zealous advocacy of the custom of erecting monuments to departed worthies in St. Paul's. In 1765 he issued a prospectus for a history of the town of Leicester; but this work, based on materials collected by Thomas Stavely, he never even began; it was finished by the learned printer, John Nichols. In the year after the publication of his Leicester "proposal" he gave to the world his famous *Essay on the Learning of Shakespeare*, in which he proved that the bard's acquaintance with ancient and modern Continental literature was exclusively derived from translations, of which he copied even the blunders. "Shakespeare," he said, "wanted not the stilts of language to raise him above all other men." "He came out of nature's hand, like Pallas out of Jove's head, at full growth and mature." "One might," he said—by way of ridiculing the Shakespearian criticism of the day—"with equal wisdom, study the Talmud for an exposition of *Tristram Shandy*." For wealth of information, terseness of language, and force of demonstration, the essay is unsurpassed by any work of the kind. It fully justifies the author's description of himself in the preface to the second edition, "I may consider myself as the pioneer of the commentators; I have removed a deal of learned rubbish, and pointed out to them Shakespeare's track in the ever pleasant paths of nature." Farmer died at Cambridge on the 8th September, 1797. He was, it appears, twice offered a bishopric by Pitt, but declined the preferment. From all that is known of him it may be inferred that Farmer's habits of life were scarcely compatible with episcopal reserve and dignity. He has been described as being more of a boon companion than a clergyman; and for a clergyman, he was too intimate with the play-house, on Shakespearian occasions especially.

For details of Farmer's life see the *Literary Anecdotes*, etc., of John Nichols.

FARNABIE, or Farnaby, Thomas (1575–1647), grammarian, classical commentator, and one of the most noted schoolmasters of his day, was a native of London. He was the son of a carpenter; his grandfather, it is said, had been mayor of Truro, and his grandfather an Italian musician. Between 1590 and 1595 he appears successively as a student of Merton, a pupil in a Jesuit college in Spain, and a follower of Drake and Hawkins during their expedition in the last-named year. After some military service in the Low Countries, "he made shift," says Wood, "to be set on shore in the western part of England; where, after some wandering to and fro under the name of Tho. Bainrafe, the anagram of his surname, he settled at Martock, in Somersetshire, and taught the grammar school there for some time with good success. After he had gotten some feathers at Martock, he took his flight to London," and opened a school in Goldsmith's Rents, Cripplegate. From this school, which contained as many as 300 pupils, there issued, says the same authority, "more churchmen and statesmen than from any school taught by one man in England." In the course of his London career "he was made master of arts of Cambridge, and soon afterwards incorporated at Oxon." Such was his pecuniary success in the metropolis that he was enabled to buy an estate at Otford, near Sevenoaks, Kent, to which he retired from London in the year 1636, still, however, carrying on his profession of schoolmaster, his pupils, it appears, being all, or nearly all, boarders—the sons of noblemen and gentlemen. In course of time he increased his property at Otford, and bought another estate near Horsham in Sussex. In politics he was a Royalist; and it was in consequence of his suspected participation in the rising near Tunbridge, 1643, that the parliament discussed a proposal for his banishment to America, and eventually imprisoned him in Ely House, Holborn. He died in June, 1647. These details of his life were derived, by Anthony à Wood, from Francis, Farnabie's son by his second wife, who was the daughter of Dr. Howson, bishop of Durham. His works chiefly consisted of annotated editions of Juvenal, Persius, Seneca, Martial, Lucan, Virgil, Ovid, and Terence. His *Systema Grammaticum* was published in London in 1641. On 6th April, 1632, Farnabie was presented with a royal patent granting him, for the space of twenty-one years, the sole right of printing and publishing certain of his works.

FARNESE, the name of a noble Italian house, to which belonged Pope Paul III., the celebrated Elizabeth, wife of Philip V. of Spain, and a long line of princes of Parma, including the great governor of the Netherlands. The first member of the family known in history was Ranuccio Farnese, a successful general of the church, who held the papal fiefs of Farnese and Montalto in the 13th century. Several of his descendants also fought with distinction in the armies of the Holy See, and others allied themselves with Florence, Venice, Siena, and other states, among whom may be mentioned Pietro Farnese, who led the Florentines to victory over Pisa in the middle of the 14th century. The historical importance of the Farnesi dates, however, from the accession of Alessandro Farnese to the papal throne as Paul III. Through his unblushing nepotism the dignity and domains of the family were greatly enlarged. For its aggrandizement the fiefs of Parma and Piacenza, Castro, and Camerino were alienated from the papacy; the marquisate of Novara was obtained from Charles V.; and marriages were arranged which allied it with the royal houses of Spain and France.

Pierluigi Farnese (1493–1547), born in 1493, was the natural son of Pope Paul III., who appointed him gonfaloniere, or captain-general of the armies of the church, created him sovereign duke of Parma and Piacenza, and obtained for him the much coveted dignity of patrician of Venice. His character was shamelessly vicious and tyrannical. He deprived his nobles of their most dearly cherished privileges, forbade them to maintain armed retainers, and forced them, on pain of confiscation, to leave their estates and reside in the towns. His cruelty appeared in his ruthless massacre of the people of Perugia, who had revolted against his father; and his uncontrollable passion in the outrage he committed against the bishop of Fano. At length a conspiracy against him was formed among his own subjects, assisted by Ferrante Gonzago, the imperial governor of Milan, and he was assassinated in his palace. His body was flung from the window, and dragged by the mob in triumph through the streets, September 10, 1547. (See Affo, *Vita Pierluigi Farnese.*)

Pierluigi had several children, for all of whom Paul made a careful and generous provision. The eldest, Alessandro Farnese (1519–1589), was, while a mere child, created bishop of Parma by Clement VII., and he was only fourteen when his grandfather, Paul III., appointed him cardinal. He was a man of learning, and of artistic tastes. It was he who completed the Farnese palace. He also displayed the diplomatic ability which appeared natural to his family, as papal envoy to Germany, France, and the Low Countries. Orazio, the third son of Pierluigi, Paul created duke of Castro, and married to Diana, natural daughter of Henry II. of France. His fourth son, Ranuccio, was made a cardinal when fourteen years of age.

Ottavio Farnese (1520-86), the second son and successor of Pierluigi, was born in 1520. The marquisate of Novara was obtained for him as an imperial fief by his grandfather Paul III., in pursuance of whose policy he was married at twelve years of age to Margaret of Austria (see Margaret of Parma), daughter of Charles V., and widow of the debauched Alessandro de' Medici. She was then twenty, and not unnaturally looked with dislike upon the boy bridegroom to whom she was compelled to unite herself. For several years she refused to live with him; but after his return, wounded, from the expedition into Barbary, in which he had fought bravely under her father, her aversion seems to have entirely disappeared. But a life of activity and independence was best suited to her character, and in 1559 she again separated from him, being appointed governor of the Netherlands, which she ruled with masculine resolution for eight years. Besides taking part in the expedition to Barbary, Ottavio also fought for Charles, at the head of the Italian auxiliaries, against the Protestants of Germany. He was twenty-seven when, by the murder of his father, he became duke of Parma. Piacenza was held by the imperialist troops which had seized it; and the means to be used for its recovery became the subject of a quarrel between the pope and Ottavio, who was supported by his brother Cardinal Alessandro. In consequence, Paul commanded the governor of Parma, Camillo Orsino, to refuse admittance to his grandson. Ottavio retaliated by an unsuccessful attack upon Parma, and even appealed to his enemy the emperor for assistance. The death of Paul, hastened by vexation at this unnatural rebellion, quickly followed; and Julius III., under the influence of the two cardinals Farnese, restored Parma to Ottavio. His quarrel with the emperor, however, was not at an end; and in 1551, having formed an alliance with Henry II. of France, he was driven from his fiefs by the imperial party. But it was not long before the influence of his wife obtained his restoration. The rest of his life was spent peacefully at home, and the moderation of his government earned for him the affection of his people. He died in 1586, and was succeeded by his son, Alessandro Farnese, the great servant of Philip II., noticed separately below.

Ranuccio Farnese (1569-1622), born in 1569, was the son of the famous Alessandro Farnese, prince of Parma, under whom he served for some time in the Low Countries. His gloomy pride and his avarice rendered him unpopular, and his suspicious temper led him into several acts of atrocious cruelty. On the birth of a legitimate heir, he placed his bastard son, whom he had formerly intended to make his successor, in strict confinement, in which the young man soon died; and on the charge of being implicated in a conspiracy, in the real existence of which few believed, he beheaded several of his nobles, confiscated their estates, and hanged numbers of their retainers. He had, however, some taste for art; and he built a fine theatre at Parma on the model of the ancient Roman theatres. He died in 1622. His son Odoardo (1612–46) fought in alliance with France against Spain. His failure to pay the interest of the money he had borrowed at Rome, and the desire of the pope to obtain the duchy of Castro for his relatives, the Barberini, gave rise to a war with Urban VIII. Odoardo's successor, Ranuccio, was also engaged in war with the Holy See; and, during his reign, Innocent, taking advantage of his weakness, and using as pretext the murder of the bishop of Castro, razed that town.

In 1731 the male line of Farnese became extinct by the death of Antonio Farnese. But Antonio's daughter, Elizabeth Farnese (noticed below), was the queen of Philip V. of Spain, and through her efforts her sons succeeded to the Farnese fiefs, the duchy of Castro being secured to Don Philippo by the treaty of Aix-la-Chapelle (1748), and the rest falling to the share of Don Carlos (at that time king of Naples and Sicily, afterwards king of Spain), together with the splendid family property in Rome—the Palazzo Farnese and the Farnese gardens. A large part of the Farnese art collection—including the Hercules, the

Bull, and the Flora—was removed to the museum at Naples. The Neapolitan court resided in the Farnese palace for many years. In 1861 the Farnese gardens, which belonged to the pope, and had been held in fee by the king of Naples, were bought by Napoleon III. from Francis II. for 250,000 francs, and they now belong to the Italian Government, which bought them in 1870 for 650,000 francs. See Rome.

FARNESE, Alexander, Pope Paul III. See Paul III.

FARNESE, Alexander (1546-1592), prince of Parma, the famous governor of the Low Countries, was born most probably about 1546. He was the son of Ottavio Farnese, prince of Parma, and the celebrated Margaret of Austria, natural daughter of Charles V. His boyhood he spent at Alcala and Madrid, having as companions his ill-fated cousin Don Carlos and his uncle Don John of Austria, who were both about the same age as himself. His chief delight was in martial exercises, and his passionate ambition was for warlike glory. At eleven years of age he earnestly begged leave to join the expedition which fought at St. Quentin, and wept bitterly when his request was refused. He had, indeed, a love for fighting for its own sake. During the wearisome inactivity of his residence at Brussels with his mother, whose abilities and masculine force of character had led to her appointment as governor of the Low Countries, it was his nightly amusement to saunter in disguise through the streets and challenge any cavalier of martial appearance whom he met. As a young man he was extremely unpopular among the Netherlanders; men said that he was nothing but a coxcomb and a bravo. He treated even the nobility with the most insolent arrogance. When he honored them with an invitation to dinner, he sat for the most part silent at the head of the table, and placed his guests below the salt. During his stay at Brussels, on the 18th November, 1565, his marriage with that wonderful paragon of propriety, Donna Maria of Portugal, was celebrated with great splendor and at prodigious expense.

At length, after years of impatient waiting, his passionate longing for military glory could no longer be repressed, and in 1571 he gained his first laurels by brilliant personal bravery in the battle of Lepanto. It was seven years before he had an opportunity of proving his splendid ability as a general. In the end of 1577 he was placed in command of the reinforcements sent to Don John, and it was mainly his prompt decision at a critical moment which secured the victory of Gemblours (1578). His abilities were now recognized by his master Philip II., and on the death of Don John, he was appointed governor of the Netherlands.

This position, beset on every hand with difficulties apparently insuperable, was exactly that which afforded the best opportunity for the display of his remarkable talents and character. He gave his whole heart to his work, never questioning the justice of the cause. Birth and education had endowed him with the soul of a prince, with its virtues and its faults; and it probably never occurred to him to doubt that the world was created as a field for the ambition of princes, or to imagine that the plain Netherland burghers, who certainly did not display a very satisfactory capacity for ruling themselves in the crisis of national danger, were, with all their failings, really fighting for a noble cause. To him they were self-willed rebels and heretics. In military ability Alexander Farnese was not surpassed, if equalled, by any of his contemporaries. He possessed in a very high degree the power of command; his ill-fed, ill-clad, unpaid soldiers rendered him the most perfect obedience. A consummate master of strategy, fertile in resource, prompt and vigorous in action, partly by the power of his genius and partly by the contagion of his dauntless courage, he performed the greatest achievements with the slenderest means. His coolness in danger amounted to rashness. Once, while dining within range of the enemy, a shot scattered the brains of one of his companions on the table, but he ordered a new cloth to be laid, and would not give the enemy the satisfaction of interfering with his arrangements. His skill in diplomacy was second only to his generalship, but it was a diplomacy without scruple, and his dissimulation was remarkable even in that age. Yet though jealousy preferred numerous charges against him, there is no reason to doubt his fidelity to his ungrateful master.

He found the Netherlands distracted by petty jealousies and party quarrels, and to take advantage of these all his skill in diplomacy and in the art of delicate bribery was exerted to the utmost. In the magistracies of many of the towns he created a party favorable to the king, and the Walloon provinces were induced to return to their allegiance. But he was unable to prevent the Union of Utrecht, which was formed in 1579 by the genius of William the Silent. For five years he waged equal war with that great prince, his chief exploits being the taking of Maestricht and Oudenarde. In 1584 William was assassinated. The opportunity was not lost by Farnese. He offered most favorable terms (except as regarded the matter of religion), and gained over Ghent and several other important towns. But the great town of Antwerp remained faithful to the union, and against it all his energies were now directed. The history of this siege may be taken as best displaying all the many and varied qualities of a great general which Alexander Farnese possessed. Antwerp enjoyed a natural means of defence, of which William of Orange had resolved to take advantage, and which would have enabled it to bid defiance even to the genius of Farnese. It was possible by breaking down the dykes to flood the country to the very city gates. Sainte Aldegonde, the governor, persuaded the magistracy to adopt this plan; but the butchers and others, whose private interests were threatened, offered a violent resistance, and the magistrates yielded in fear of riots. Another chance was afforded Antwerp, and the magistrates were again to blame, with far less excuse. Even after the siege commenced, numerous ships continued to bring grain into the city, which might easily have been stored with supplies for a very long period; but the magistrates fixed a minimum price, and decreed that no corn should be sold to merchants for storing in granaries, thus completely stopping the invaluable traffic. They did not for a moment believe that Farnese would be able to overcome the many difficulties of the task, and build a bridge across the Scheldt. But his engineering skill soon showed itself equal to the achievement; and it was now in his power to starve the town. Yet a third chance was allowed to Antwerp. The ingenious fireships of Gianibelli were launched against the bridge; a breach was effected; a thousand Spanish soldiers were destroyed; Farnese himself was wounded and lay senseless for some time; his army was overwhelmed with panic. The ships of the Netherlands might have brought their cargoes of corn into the town, and a fatal blow might have been struck against the Spaniards. But, through gross incompetence, the Netherlanders only learned their success too late. The moment he recovered consciousness, Farnese had set about repairing the bridge, inspiring his panic-stricken followers with his own undaunted resolution and energy, and careful precautions were taken against the recurrence of such a disaster. The only hope of Antwerp was to break down the dykes, and, taking advantage of Farnese's absence, Sainte Aldegonde collected for the work a strong and resolute force. A fierce hand-to-hand fight ensued on the slippery dykes, and the work was going slowly forward, while the Spaniards were beginning to give way, when Farnese himself appeared on the scene, and by his own exploits, and the inspiration of his presence, entirely changed the fortunes of the day. The Netherlanders fought resolutely for their homes and liberties, but at last were forced to retreat, leaving the breach unmade. Antwerp was soon obliged by famine to capitulate; Farnese, who was ignorant of the extremity of their distress, allowing a complete and universal amnesty, and only requiring that all Protestants should leave the city within two years. There was one noteworthy condition, cunningly worded and worthy of Italian diplomacy: it was provided that during the two years allowed the Protestants should not offer "any offence" to the ancient religion. The Catholic magistrates whom Farnese had appointed, and the Spanish garrison which held the citadel he had rebuilt, were, of course, the sole judges of what constituted such an offence.

The year 1586 he employed in taking steps to obtain the command of the Meuse and Rhine. Grave, Gelders, and Deventer he gained by bribery and intrigue, and Neuss, by assault. In this year negotiations were opened with Elizabeth, who had sent an army under Leicester into the Low Countries. These negotiations are the most striking illustration of Parma's principles of diplomacy. So perfect was his apparent frankness that even Elizabeth and Burleigh, who were well accustomed to double-dealing, appear to have been completely deceived. From the first Farnese had been told by his master that the negotiations were to lead to nothing; and at the very moment when he had just received orders to invade England, he was assuring the queen that "really and truly" nothing was intended against her majesty or her kingdom.

As time went on, Parma's position grew more and more difficult. His soldiers died in hundreds from cold, hunger, and disease; money was doled out to him with the most niggardly hand; and it required all his influence to keep down mutiny. He was constantly harassed by Philip's commands to attempt the impossible. He had prepared a fleet of transport boats, and the king issued repeated orders that he should with these invade England, though every port was blockaded by the ships of Holland and Zealand. Once, goaded to rashness, he made a mad attempt to break through the line, but the odds were too great, and he was repulsed with heavy loss. Even after the failure of the Armada, Philip still thought that Farnese with his unarmed boats should do that which the huge warships had failed to accomplish.

In 1590 the condition of the Spanish troops had become intolerable. Farnese could no longer support them from his private resources; his very jewels were pledged, and the supplies from the king did not increase in regularity or amount. A mutiny broke out but was speedily suppressed. Under these difficulties, Farnese was commanded to leave the work of years, and raise the siege of Paris, which was surrounded by Henry of Navarre. He left the Netherlands on the 3d August, 1590, with 15,000 troops. At Meaux he swore publicly in the cathedral that he had come, not to conquer France, but only to assist the Catholic cause. By the most splendid strategy he outwitted Henry, and relieved Paris; but his troops being insufficiently supplied, he was compelled immediately to return to the Low Countries, losing on the march many stragglers and wounded, who were killed by the peasantry, and leaving all the positions he had taken to be recaptured by Henry.

Again, in 1591, in the very midst of a desperate contest with the genius of Prince Maurice, sorely against his will, Farnese was obliged to give up the engrossing struggle and march to relieve Rouen. Henry at once cautiously raised the siege. In a subsequent engagement Farnese was wounded by a musket-ball in the arm. Yet he defied pain and fever, refused to take the necessary rest, and was carried in his couch to the field. At length Henry seemed to have shut in the Spanish army safely in the land of Caux, but Farnese found means to escape across the Seine. He spent a few days in Paris, and then visited Spa to drink the waters.

All his splendid services had not gained for him the confidence of Philip. His enemies persuaded the king that he was only striving to conquer the Netherlands that he might obtain the sovereignty for himself. Philip's first characteristic step was to despatch a letter expressing complete confidence and tender affection; Farnese was then politely requested to return home to aid his majesty with his advice. But at the same time the marquis of Cerralbo was sent to the Netherlands to share his work with the Mansfelds, and with orders to send him home by force, if he refused to obey the king's deceitful command. But all trouble was spared the grateful monarch. In the autumn of 1592 Alexander Farnese prepared to invade France for the third time. His robust constitution ruined by the prodigious labors he had performed, gouty, dropsical, fevered with his wounds, he was lifted into his saddle every day till the very morning of his death. On the 3d December, 1592, in the town of Arras, he fainted while undressing for bed, and in a few hours was dead. He was only forty-six years of age. By his own command he was laid out in the garb of a Capuchin friar. His services were rewarded by a pompous funeral at Brussels, at which his Italian and Spanish veterans fought together for the first place among the mourners, and his statue was placed in the Capitol at Rome. He was buried in the church of his own capital of Parma.

See Strada, the historiographer of the Farnese family; Motley, *Dutch Republic and United Netherlands;* Gachard, *Correspondance de Philippe II.*

FARNESE, Elizabeth (1692–1766), queen of Spain, born on the 25th October, 1692, was the only daughter of Odoardo II., prince of Parma. Her mother educated her in strict seclusion, but seclusion altogether failed to tame her imperious and ambitious temper. At the age of twenty-one (1714) she was married by proxy at Parma to Philip V. of Spain. The marriage was arranged by the Italian cardinal Alberoni, with the concurrence, it is said, of the king's mistress, the Princess Orsino. On her arrival at the borders of Spain Elizabeth was met by the princess; but she received her rival sternly, and, perhaps in accordance with a plan previously concerted with the king, at once ordered her to be removed from her presence and from Spain. Over the weak king Elizabeth quickly obtained complete influence. This influence was exerted altogether in support of the policy of her countryman Alberoni, one chief aim of which was to recover the ancient Italian possessions of Spain, and which actually resulted in the seizure of Sardinia and Sicily. So vigorously did she enter into this policy that, when the French forces advanced to the Pyrenees, she placed herself at the head of one division of the Spanish army. But Elizabeth's ambition was grievously disappointed. The Triple Alliance thwarted her plans, and at length in 1720 the allies made the banishment of Alberoni a condition of peace. Sicily also had to be evacuated. And finally, all her entreaties failed to prevent the abdication of Philip, who in 1724 gave up the throne to his heir, and retired to the palace of La Granja. Seven months later, however, the death of the young king recalled him to the throne. In 1736 Elizabeth had the satisfaction of seeing her favorite scheme realized in the accession of her son Don Carlos (afterwards Charles VI.) to the throne of the Two Sicilies and his recognition by the Powers in the Treaty of Vienna. Elizabeth survived her husband twenty years, dying in 1766.

See Philip V. of Spain; Spain; *Mémoires pour servir à l'histoire d'Espagne sous le règne de Philippe V.*, by the Marquis de St. Philippe, translated by Maudave, Paris, 1756; *Memoirs of Elizabeth Farnese*, London, 1746.

FARNHAM, a market-town of England, county of Surrey, near the left bank of the Wey, 10 miles W.S.W. of Guildford, and 40 miles from London by rail. It is built on the southern slope of a hill rising about 700 feet above the level of the sea, and consists principally of two main streets, with a market-place at their intersection. It is well supplied with water from springs in the neighboring hills, conveyed by pipes to a large reservoir in the town. Farnham was formerly noted for its cloth manufacture, which is now quite extinct. It is chiefly celebrated for the hops of a very superior quality cultivated in the vicinity. The parish church is a spacious edifice in the later Gothic style, and was formerly a chapel of ease to Waverley Abbey (founded in 1128), of which some remains still exist in the vicinity. A fine new town-hall, in the Italian style of architecture, was erected in 1866. Population (1871), 4461.

Farnham was early a place of importance, and sent two members to parliament from 4th Edward II. to 38th Henry VI. Farnham Castle, on a hill north of the town, now the seat of the bishop of Winchester, was first built by Henry de Blois, bishop of Winchester, and brother of King Stephen; but it was razed by Henry III. It was rebuilt and garrisoned for Charles I. by Denham, from whom it was taken in 1642 by Sir W. Waller; and having been dismantled, it was restored by Dr. Morley, bishop of Winchester. Cobbett was born in the parish of Farnham, and his remains are interred near the main entrance of the church.

FARO, a city and seaport of Portugal, chief town of the province of Algarve, is situated on the Rio Fermoso, near its mouth, 20 miles W. by S. of Tavira. It is surrounded by walls, and contains a cathedral, a military hospital, a custom-house, an arsenal, and several convents and charitable establishments. At the eastern end of the town is an old castle surrounded by Moorish fortifications. The harbor is small, but it has a good roadstead. The exports are figs, raisins, almonds, dates, oranges, lemons, wines, cork, sumach, baskets, and anchovies. Faro was burned by the English in 1596, and was partly destroyed by an earthquake in 1755. The population is about 8000.

FAROE ISLANDS, or Feroe Islands (Danish, *Färöerne*), a group in the North Sea belonging to Denmark. They are situated between Iceland and the Shetland Islands, about 200 miles N.W. of the latter, between 61° 20′ and 62° 25′ N. lat., and between 6° 16′ and 7° 40′ W. long. The total area of the group is 510 square miles, and that of the seventeen inhabited islands 490. The population in 1850 amounted to 9150, in 1860 to 8922, and in 1874 to

10,500. The principal islands are Strömö with 2400 inhabitants, Osterö 2067, Süderö 1387, Vaagö 702, Sandö 618, and Bordö 358. They consist throughout of rocks and hills, separated from each other by narrow valleys or ravines; but though the hills rise abruptly, there are often on their summits, or at different stages of their ascent, plains of considerable magnitude. They everywhere present to the sea perpendicular cliffs, broken into a thousand fantastic forms, affording at every turn, to those who sail along the coast, the most picturesque and varied scenery. The highest peaks are Slattaretind in Osterö, and Skellingfjeld, Skalingfield, or Ben Scarling in Strömö, which, according to barometric measurement, rise respectively to about 2890 and 2506 feet above the sea. The rocks are generally trap, and exhibit little variety of composition, though they present some striking geological phenomena. The zeolites and chalcedonies of the Faroes have long supplied the best specimens to the cabinets of Europe. Turf is abundant. Coal is found in Süderö and some of the other islands in sufficient quantity to make it a matter of exploitation. In 1872 an expedition was sent out by the United Steamship Company (*forenede Dampskibselskab*) to investigate the geology of the coal-fields, and in 1876 works were commenced at Trangisvaag and Frodebo.

The climate is foggy, and violent storms are frequent at all seasons. July and August are the only true summer months, but the winters are not very severe. It seldom freezes for more than one month, and the harbors are rarely ice-bound. The only grain crop is barley; and on account of the uncertainty of the weather, it is frequently reaped in a half-ripe condition. Agriculture is in a very backward state, the infield or cultivated land being calculated to be to the outfield or uncultivated in the proportion of one to sixty. As the plough is ill-suited to the rugged and uneven surface of the land, the ground is usually turned up with the spade, care being taken not to destroy the roots of the grass. Horses and cows are few in number, and the latter give very little milk, in consequence probably of the very coarse hay upon which they are fed. Sheep form the chief riches of the islanders, some individuals having flocks of from three to five hundred, and the total number in the islands being about 80,000. They are never housed either in summer or winter, and in severe seasons they suffer considerably. The wool is generally coarse, and is torn off the animals in so rough a manner as often to lacerate the skin. The northern hare (*Lepus alpinus*) is pretty abundant in Strömö and Osterö, having been introduced into the islands about 1840-50. Besides the ordinary Norway rat there still exist some few representatives of the older black rat (*Mus rattus*), and, according to popular accounts, a third species not yet scientifically identified. The catching of the numerous sea-birds which build their nests upon the face of the cliffs forms an important source of subsistence to the inhabitants. Sometimes the fowler is let down from the top of the cliff; at other times he climbs the rocks, or, where that is possible, is pushed upwards by poles made for the purpose. The puffin (*Alca arctica*) is the commonest species, and the eider duck is frequently shot for food. The cod fishery is especially important,—the dried fish being exported to Spain and France, the swim-bladders made into gelatine, and the ovaries prepared for the anchovy fisher of the Mediterranean. Several Salmonidæ are found in the streams and lakes,—among them the charr (*Salmo salvelinus*), which occurs in Upper Bavaria and Scotland. According to Mörch, there are 13 species of land and fresh-water mollusks, but not one of them is peculiar to the islands.

The trade of the Faroe Islands was for some time a monopoly in the hands of a mercantile house at Copenhagen, and this monopoly was afterwards assumed by the Danish Government, but by the law of March 21, 1855, all restrictions were removed. Hosiery, tallow, dried and salt fish, train-oil, feathers, skins, and butter are the chief exports. Thorshavn, the chief town of the islands, is situated on the S.E. side of Strömö, upon a narrow tongue of land, having creeks on each side, where ships may be safely moored. Its population is only between 500 and 600; but it is the seat of the chief Government and ecclesiastical officials, and has a castle, a hospital, and a library. The houses are built of wood and roofed with birch bark covered with turf, the greenness of which makes it impossible at a very short distance to distinguish the place from the surrounding fields. The character of the people is generally marked by great simplicity of manners, kindness, and hospitality. They are well fed and clothed, and seem to be kindly treated by the Danish Government. The average duration of life, as stated by Dr. Panum, is 44⅔ years, while in Denmark it is only 36.

The Faroe Islands were, it would appear, first colonized by a certain Grim Kamban in the time of Harold Haarfager; and Christianity was introduced by Sigmund Bresterson at the command of Olaf Tryggvason. They are said to derive their present name from the number of sheep (*faar*); in the Middle Ages they were known by the name of Friesland, which was corrupted by the Arabian geographers into Reslanda. English adventurers gave great trouble to the inhabitants in the 16th century, and the name of Magnus Heiresen, a native of Strömö, who was sent by Frederick II. to clear the seas, is still celebrated in many a song and story. There was formerly a bishopric at Kirkebo, but it was abolished at the introduction of Protestantism by Christian III., and the islands are now ecclesiastically dependent on the bishopric of Zealand. The kingdom of Denmark retained possession of the Faroes at the peace of Kiel in 1815, though they had originally belonged to Norway. The language of the people is a remnant of the Old Norse, but that of the courts, churches, and schools is the modern Danish. The statement that there is no native literature is a mistake: not to speak of the famous *Færeyinga Saga*, which was published by Rufn and Mohnike at Copenhagen in 1833, the botanist, H. C. Lyngbye, who visited the islands for the study of their Algæ, brought back and published in 1822 a number of the popular songs about Sigurd, and a new treatment of the same theme appeared at Paderborn in 1877.

Literature.—Lucas Jacobson Debes, *Feroa Reserata*, Copenhagen, 1673 (English translation by Slerpin, London, 1675, German by Mengel, Copenhagen, 1757); Torfæus, *Comm. hist. de rebus gestis Færeyensium*, ibid. 1695; Landt, *Beskrivelse over Färöerne*, 1800, and *Descriptions of the Feroe Islands*, London, 1810; An account of their geology and mineralogy, by Sir G. S. Mackenzie and Thomas Allen, in the *Trans. of the Roy. Soc. of Edinburgh*, vol. vii.; Pauly, *Topog. von Dännemarck einschliesslich Islands und der Färöer*, Altona, 1828; Forchhammer in *The Transactions of the Danish Royal Society*; R. Chambers, *Faro Islands and Iceland*, 1856; K. Maurer, "Die Faröer" in Westermann's *Illust. Monatsheften*, Brunswick, 1862; A. J. Symington, *Pen and Pencil Sketches of Faroe and Iceland*, London, 1862; Tennant in *Journal of Scottish Meteorol. Soc.*, 1871; Willemoes Sühm in *Nature*, 1872; G. A. Richter, "Die Faroer und Thorshavn," in *Aus Allen Welttheilen*, 1874; Sjurthar Kraeth, *Die färöischen Lieder von Sigurd zum erstenmal mit Einleit*, etc., Paderborn, 1877.

FARQUHAR, GEORGE (1678-1707), a dramatist of the last century, the successor in comedy of Wycherley and Congreve, was the son of a clergyman, and was born in Londonderry, Ireland, in the year 1678. In his sixteenth year he was sent to Trinity College, Dublin, under the patronage of the bishop of Dromore. He was entered as a sizer or servitor, a class of poor scholars, who were compelled to wear a peculiar dress and perform menial offices. These are no longer exacted from their successors, but Goldsmith, sixty years after the date of Farquhar's admission, had to submit to the humiliations incident to the position of a sizer—to sweep part of the college courts, to carry up the fellows' dinner to table, and to wait in the hall till the fellows had dined. It certainly implied a contradiction, as Goldsmith observed, for men to be "at once learning the liberal arts, and at the same time treated as slaves," and neither in the case of Farquhar nor of Goldsmith was the system attended with favorable results. The former soon broke away from his studies, and appeared as an actor on the Dublin stage. He had the advantage of a good person, though with a weak voice, but was timid and sensitive, and an accident which happened to him when he had only been about a twelvemonth on the boards made him resolve to quit the profession. When performing the part of Guyomar in Dryden's *Indian Emperor* he had omitted to exchange his sword for a foil, and in a fencing scene wounded a brother performer so severely that his life was despaired of. The sufferer recovered, but Farquhar would never again return to the stage. The earl of Orrery gave him a lieutenancy in his regiment then in Ireland, and as a soldier Farquhar is said to have given proofs of his courage and conduct, though none are recorded. We have two letters written by him in Holland in 1700, but in these he says nothing of military service. While yet a minor he appeared as a dramatist. His comedy of *Love and a Bottle* was performed at Drury Lane in 1698, and its success far exceeded his expectations. His next comedy, *The Constant Couple* (1700), was still more favorably received. Wilks, a popular comedian and a special friend of Farquhar's (they had been associates in Dublin), by his performance of the part of Sir Harry Wildair contributed very much to the success of the play. "He *made* the part," says Farquhar. In the following year the dramatist brought out a sequel to it, entitled *Sir Harry Wildair*. Wilks's acting was again attractive, but like all continuations (that of Don Quixote excepted) the second part was much inferior to the first. Leigh Hunt has stated that Mrs. Oldfield, like Wilks, performed to admiration in this piece, but Mrs. Oldfield was not the original heroine (Lady Lurewell). The part was acted by Mrs. Verbruggen. Mrs. Oldfield performed in the two last and best of Farquhar's seven comedies, and is said to have taken to the stage by his advice. She was the theatrical idol—the Mrs. Jordan—of her day. Her exquisite acting and lady-like carriage were the delight of her contemporaries, and her beauty, her vanity, and her generosity found innumerable eulogists—

> "Engaging Oldfield, who, with grace and ease,
> Could join the arts to ruin and to please."[1]

In 1702 Farquhar published a trifling volume of *Miscellanies*—poems, letters, and a discourse on comedy. The poems are below mediocrity, and the letters are written in that overstrained style of gallantry and smartness which was then fashionable and considered witty. In one letter he gives a lady a picture of himself "drawn from the life." His mind, he says, was generally dressed, like his person, in black; he was taken for an easy-natured man by his own sex, and an ill-natured clown by the ladies; strangers had a worse opinion of him than he deserved, but this was recompensed by the opinion of his acquaintance, which was above his desert. Self-portraiture is seldom faithful, but we may conclude from Farquhar's outline, that the young dramatist was somewhat grave and reserved, and wanted address for general society. He was liveliest with the pen in his hand. The discourse on comedy is more worthy of the author than his poems or letters. In it he defends the English disregard of the dramatic unities. "The rules of English comedy," he says, "don't lie in the compass of Aristotle or his followers, but in the pit, box, and galleries." In 1703 Farquhar had another comedy on the stage—*The Inconstant, or the way to win him*—the *hint* of which he says, he took from Fletcher's *Wild Goose Chase*, but was charged with spoiling the original. The poetry of Fletcher certainly evaporates when its scenes are transmuted into the prose dialogue of Farquhar.

About this time the dramatist was betrayed into what was perhaps the greatest blunder of his life. A lady conceived a violent passion for him, and, though penniless like himself, contrived to circulate a report that she was possessed of a large fortune. Farquhar snapped at the gilded bait. He married the lady, and found too late that he had been deceived. It is related, however, that he had the magnanimity to pardon a deception which must have appeared a compliment to his genius, and in truth there was something to forgive on his own part for having been so readily entrapped contrary to all the rules of love and the drama. Increased exertion, however, was necessary, and in 1704 he produced *The Stage Coach*, a piece adapted from the French by Farquhar in conjunction with Anthony Motteux, a clever, reckless playwright and essayist, and remarkable as having, though a Frenchman, given the world the best English translation of Don Quixote. Three more comedies proceeded from Farquhar before his career was sadly closed at the age of thirty. *The Twin Rivals* was brought out in 1705, *The Recruiting Officer* in 1706, and *The Beaux Stratagem* in 1707. The last two are vastly superior to Farquhar's other plays, and are the works by which he is now remembered. To relieve the poor dramatist from his difficulties, increased by his ill-starred marriage, the duke of Ormond is said to have advised him to sell his commission in the army and pay his debts, his grace promising at the same time to give him a captaincy in his own regiment. Farquhar sold his commission, but the duke either forgot or was unable to fulfil his promise. Farquhar's earliest biographer ascribes the unfortunate counsel to a "certain great courtier," who made solemn assurance which he forgot to keep. *The Beaux Stratagem* was written in six weeks, while death was impending over its author. Before he had finished the second act he knew that he was stricken with a mortal illness, but it was necessary to persevere and to be "consumedly lively" to the end. He had received in advance £30 for the copyright from Lintot the bookseller. The play was brought on the stage March 8, and Farquhar lived to have his third night, and an extra benefit on the 29th of April, on which day he is said to have died. He left his two children to the care of his friend Wilks:—"Dear Bob, I have nothing to leave thee to perpetuate my memory but two helpless girls. Look upon them sometimes and think of him that was to the last moment of his life thine, GEORGE FARQUHAR." Wilks obtained a benefit at the theatre for the dramatist's widow, and the daughters had a pension of £30 a year, which one of them was in receipt of so late as 1764. The plots of Farquhar's comedies are skilfully conducted and evolved; his situations are well chosen (in these his friend Wilks's advice would be useful), and his dialogues are full of life and spirit. To the polished wit and brilliancy of Congreve he has no pretension. His scenes are light and sketchy, and his characters altogether on a lower level than Congreve's, but they were quite equal to them in stage effect. Sergeant Kite, Scrub, Archer, and Boniface are distinct original characters which long charmed on the stage, while the incidents with which they are mixed up—the unexpected encounters, adventures, artifices, and disguises—are irresistibly comic and attractive in representation. Pope considered Farquhar a mere farce writer, while Goldsmith (who evidently adopted him as a model) preferred him to Congreve. On the stage, with good actors, he might be so preferred, but never in the library. He had the advantage of being less designedly and elaborately licentious than Congreve. Love intrigues then formed the chief business of the comic drama; and in the management of them the homely domestic virtues that form the happiness and cement of society were disregarded or made the subject of ridicule. It is true that the world of comedy was, as argued by Charles Lamb, an artificial world, never perhaps regarded as real or as supplying patterns of morals or manners, but the effect of such representations was to lower and corrupt the national taste, while the fact that no pursuit was then so profitable to an author as writing for the stage was also injurious to our imaginative literature. On this moral view of the question, the reasoning of Macaulay and the eloquent objurgation of Thackeray are unanswerable.[2] The artificial comedy, or comedy of manners, as seen in the beginning of the last century, is now "quite extinct on our stage," as Leigh Hunt has observed; but Hunt is surely in error in dating the decline of English comedy from the time of Farquhar. To say nothing of Goldsmith's two plays, Sheridan's *Rivals* and *School for Scandal* show no declension in brilliancy of dialogue, wit, or vivacity, and some of the plays of Cumberland and the Colmans evince high dramatic talent. (R. CA.)

FARRAGUT, DAVID GLASCOE (1801–1870), first admiral of the United States navy, was the son of Major George Farragut, a Catalan by descent, a Minorquin by birth, who had emigrated to America in 1776, and, after the peace, had married a lady of Scotch family and settled near Knoxville, in Tennessee; there Farragut was born on the 5th July, 1801. At the early age of nine he entered the navy, under the protection of his name-father, Captain David Porter, with whom he served in the "Essex" during her cruise in the Atlantic in 1812, and afterwards in the Pacific, until her capture by the "Phœbe," in Valparaiso Bay, on the 28th March, 1814. He afterwards served on board the "Washington," 74, carrying the broad pennant of Commodore Chauncey in the Mediterranean, and pursued his professional and other studies under the instruction of the chaplain, Mr. Folsom, with whom he contracted a life-long friendship. Folsom was appointed from the "Washington" as U. S. consul at Tunis, and obtained leave for his pupil to pay him a lengthened visit, in the course of which he acquired a familiar knowledge of Arabic and Turkish. Farragut is said, in his later years, to have spoken fluently all the principal European languages; this is probably an exaggeration, but with an hereditary knowledge of Spanish, he may have picked up some French and Italian at this time; until the very end of his career, it was his only visit to European waters. In 1825 he was promoted to the rank of lieutenant, whilst serving in the navy yard at Norfolk, where he continued till 1832; he then served for a commission on the coast of Brazil, and was again appointed to the yard at Norfolk. It is needless to trace the ordinary routine of his service step by step. The officers of the U. S. navy have one great advantage which is wanting to our own; when on shore they are not necessarily parted from the service, but are employed in their several ranks in the different dockyards, escaping thus not only the private grievance and pecuniary difficulties of a very narrow half-pay, but also, what from a public point of view is much more important, the loss of professional aptitude, and of that skill which comes from unceasing practice. On the 8th September, 1841, Farragut was promoted to the rank of commander, and on the 14th September, 1855, to that of captain. At this time he was in charge of the navy yard, Mare Island, California, from which post he was recalled in 1858, and appointed to the "Brooklyn" frigate, the command of which he held for the next two years. When the war of secession broke out in 1861, he was "waiting orders" at Norfolk. By birth and marriage he was a Southerner, and the citizens of Norfolk counted on his throwing in his lot with them; but professional pride, and affection for the flag under which he had served for more than fifty years, held him true to his allegiance: he passionately rejected the proposals of his fellow-townsmen, and as it was more than hinted to him that his longer stay in Norfolk might be dangerous, he hastily quitted that place, and offered his services to the Government at Washington. These were at once accepted; he was requested to sit on the Naval Retiring Board,—a board then specially constituted for clearing the navy of unfit or disloyal officers, —and a few months later was appointed to the command of the "Western Gulf Blockading Squadron," with the rank of flag-officer, and ordered to proceed forthwith, in the "Hartford," to the Gulf of Mexico, to collect such vessels as could be spared from the blockade, to proceed up the Mississippi, to reduce the defences which guarded the approaches to New Orleans, and to take and hold the city. All this Farragut executed to the letter, with a skill and caution that won for him the love of his followers, and with a dash and boldness that won for him the admiration of the public, and the popular name of "Old Salamander." The passage of the Mississippi was forced on the 24th April, 1862, and New Orleans surrendered on the 26th; this was immediately followed by the operations against Vicksburg, from which, however, Farragut was compelled to withdraw, having relearnt the old lesson that against heavy earthworks, crowning hills of sufficient height, a purely naval attack is unavailing: it was not till the following summer, and after a long siege, that Vicksburg surrendered to a land force under General Grant. During this time the service on the Mississippi continued both difficult and irksome; nor until the river was cleared could Farragut seriously plan operations against Mobile, a port to which the fall of New Orleans had given increased importance. Even then he was long delayed by the want of monitors with which to oppose the ironclad vessels of the enemy. It was the end of July, 1864, before he was joined by these monitors; and on the 5th August, undismayed by the loss of his leading ship, the monitor "Tecumseh," sunk by a torpedo, he forced the passage into the bay, destroyed or captured the enemy's ships, including the ram "Tennessee," bearing Admiral Buchanan's flag, and took possession of the forts. The town was not occupied till the following April, but with the loss of its harbor it ceased to have any political or strategical importance. With this Farragut's active service came to an end; for though in September, 1864, he was offered the command of the force intended for the reduction of Wilmington, the state of his health, after the labors and anxieties of the past three years, in a trying climate, compelled him to decline it and to ask to be recalled. He accordingly returned to New York in December, and was received with the wildest display of popular enthusiasm. It was then that the Government instituted the rank of vice-admiral, previously unknown in the American service. Farragut was promoted to it, and in July, 1866, was further promoted to the rank of admiral. In 1867, with his flag flying in the "Franklin," he visited Europe. The appointment was an honorable distinction without political or naval import: the "Franklin" was, to all intents, for the time being, a yacht at Farragut's disposal; and her arrival in the different ports was the signal for international courtesies, entertainments, and social gayety. She returned to America in 1868, and Farragut retired into private life. Two years later, on the 14th August, 1870, he died at Portsmouth, New Hampshire.

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[1] Pope—*Sober Advice from Horace*. It was to this fascinating actress that the satirist alluded as the lady who detested being buried in woollen, and said to her attendant—

> "One would not sure be frightful when one's dead—
> And—Betty—give this cheek a little red."

She was only forty-seven when she died, leaving all the court and half the town in tears.

[2] See Macaulay's essay on the Comic Dramatists of the Reformation, and Thackeray's *English Humorists*. In 1840, Leigh Hunt published biographical and critical notices of Wycherley, Congreve, Vanbrugh, and Farquhar, prefixed to an edition of their dramatic works—a valuable addition to our dramatic literature.

No biography of Farragut, at all fitting his great reputation, has yet appeared; the only one that can be mentioned, *Life and Naval Career of Vice-Admiral Farragut*, by the Rev. P. C. Headley (1865), notwithstanding its claim to be based on personal information, is a badly-written boys' story-book, overloaded with childish and irrelevant matter. A better account of his more distinguished services is to be found in Putnam's *Rebellion Record* (1864–68) or Boynton's *History of the Navy during the Rebellion* (1867). (J. K. L.)

FARRAKHÁBÁD [Furruckábád], a district of British India, in the Agra division, and under the jurisdiction of the lieutenant-governor of the North-Western Provinces, lies between 26° 45′ 45″ and 27° 42′ 45″ N. lat., and 79° 10′ 45″ and 80° 6′ 0″ E. long. It is bounded on the N. by Budáon and Sháhjahánpur, E. by Harduí, S. by Cawnpur and Etáwah, and W. by Máinpurí and Etah. The district is a flat alluvial plain in the middle *duáb*. The principal rivers are—the Ganges, which has a course of 87 miles either bordering on or passing through the district, but is not at all times navigable by large boats throughout its entire course; the Budh Gangá, which enters the district in its north-west corner, and falls into the Ganges opposite the town of Farrakhábád, after a course of 45 miles; the Kálí-nadí (84 miles), and the Isán-nadí (42 miles), both tributaries of the Ganges; and the Arind-nadí, which, after a course of 20 miles in the south of the district, passes into Cawnpur. The census of 1872 returned the population at 499,722 males and 419,026 females,—total, 918,748, of whom 816,733 were Hindus, 101,538 Mahometans, and 477 Christians. The area of the district is 1744 square miles, of which 1021 are returned as under cultivation, and 264 as cultivable, but not actually under tillage. The principal products are rice, wheat, barley, millets, pulses, cotton, sugar-cane, potatoes, etc. The grain crops, however, are insufficient for local wants, and grain is largely imported from Oudh and Rohilkhand. The district is, therefore, liable to famine, and it has been severely visited by this calamity five times during the present century—in 1803–4, 1815–16, 1825–26, 1837–38, and in 1868–69.

The civil station and principal town is Farrakhábád, situated on the right or west bank of the Ganges in 27° 24′ N. lat. and 79° 40′ E. long.; population, 65,441. The other towns are—Fathigarh (Futtehgurh or Futtygur), civil and military station on the Ganges, 3 miles east of Farrakhábád, population 13,439; Kanauj, on the right bank of the Kálí-nadí, 17,903; Káimganj, 10,323; Shámsábád, 8710; Allahganj, 6246; Chibramau, 5444. Kanauj is of great archæological interest as being the ancient Hindu capital of this part of India. The ruins of the ancient town cover an area of five square miles. The only municipality in the district is that of Farrakhábád-cum-Fathigarh, with a population of 78,880; municipal revenue in 1875, £8177, 10s.; expenditure, £766, 6s. The total revenue of the district in 1876 was £197,229; the expenditure on civil administration, £43,755. The regular police force consisted of 943 officers and men, maintained at a cost of £10,279. For the education of the people there were 320 Government and aided schools in the district, attended by 7507 pupils, and receiving state aid to the extent of £3416. For medical relief four charitable dispensaries are maintained, at which 789 indoor and 19,732 outdoor patients were treated in 1875. Farrakhábád is one of the healthiest districts in the *duáb*, but fevers are prevalent during August and September. The average annual mean temperature is almost 80°; the average annual rainfall, 29·4 inches.

Of the tract comprising the present district, the portion lying north of the Kálí-nadí was included within the *jagír* or fief of the Rohilla nawáb of Farrakhábád, while the country to the south of the river formed part of the territories of the vizír of Oudh. During the wars of the middle of the last century, the district frequently changed hands, at one time being held by the Rohillas, and at another by the nawáb vizír. In 1774, however, the latter, with the assistance of the English, completely defeated the Rohillas; and Farrakhábád, together with the whole of Rohilkhand, passed into his hands, and remained with him till 1801, when it was ceded to the East India Company. In 1804 the Marhattás, under Holkar, ravaged this tract, but were utterly routed by Lord Lake at the town of Farrakhábád. During the mutiny Farrakhábád shared the fate of other districts, and passed entirely out of our hands for a time. The native troops, who had for some time previously evinced a seditious spirit, finally broke into rebellion on the 18th June, 1857, and placed the titular nawáb of Farrakhábád on the throne. The English military residents took shelter in the fort, which they held until the 4th July, when, the fort being undermined, they endeavored to escape by the river. One boat succeeded in reaching Cawnpur, but only to fall into the hands of the Náná. Its occupants were made prisoners, and perished in the massacre of the 10th July. The other boat was stopped on its progress down the river, and all those in it were captured or killed, except four who escaped. The prisoners were conveyed back to Fathigarh, and murdered there by the nawáb on the 19th July. The rebels were defeated in several engagements, and on the 3d January, 1858, the English troops recaptured Fathigarh fort; but it was not till May that order was thoroughly re-established. Since then nothing has occurred to disturb the peace of the district.

FARRANT, RICHARD, composer of English church music, flourished during the 16th century. Very little is known about him. Fétis gives 1530 as the date of his birth, but on what authority does not appear. He became a gentleman of the Chapel Royal in the reign of Edward VI., but resigned his post in 1564, on being appointed master of the children of St. George's Chapel, Windsor. In this capacity he presented a play before the queen at Shrovetide, 1568, and again at Christmas of the same year, receiving on each occasion the sum of £6, 13s. 4d. In November, 1569, he was reinstated as gentleman of the Chapel Royal. It is stated by Hawkins (*History of Music*, vol. iii. 279) that Farrant was also one of the clerks and organists of St. George's Chapel, Windsor, and that he retained these posts till his death. Many of his compositions are printed in the collections of Barnard and Boyce. Among the most admired of them are a service in G minor, and the anthems "Call to remembrance" and "Hide not thou thy face." It is doubtful whether Farrant is entitled to the credit of the authorship of the beautiful anthem "Lord, for thy tender mercies' sake." No copy of the music under his name appeared in print till 1800, although it had been earlier attributed to him. Some writers have named John Hilton, and others Thomas Tallis, as the composer. From entries in the *Old Check Book of the Chapel Royal* (recently edited for the Camden Society by Dr. Rimbault) it appears that Farrant died, not in 1585, as Hawkins states, but on November 30, 1580 or 1581.

FARS, or FARSISTAN, a province of Persia, extending along the Persian Gulf, and conterminous with Khusistan, Irak, and Kirman. Like the provinces to the N. and S., it is divided in three parallel districts,—the Dushtistan Germsir or hot country, the Tengsir or land of the passes, and the Sirhud or cold country. Its mountain ranges run parallel with the coast-line, and inclose a great number of valleys, both longitudinal and transverse. In some of these are considerable lakes, as, for example, the lake of Shiraz, and the salt lake Bakhtagan, which is about 75 miles long, and receives the waters of the Polwar or Kur. Of the rivers which flow into the Persian Gulf, the most important are the Prestaf in the S. and the Sefid Rud in the N. The coast is for the most part steep and inaccessible, but there are harbors at Bushire, Bender Kongun, and Bender Kakhil. As the cultivation of the Dushtistan region depends entirely on the periodical rains, years of abundance alternate with years of dearth. Inland among the mountains there is a great deal of excellent pasture land, but most of it lies quite unemployed by the thinly scattered population. Grain of various kinds, dates, tobacco, cotton, and hemp are all grown to some extent, and are usually of excellent quality; wine is manufactured, and the silk-worm reared; and a certain amount of attention is given to the weaving of cottons, silks, woollens, and camel-hair fabrics. An account of the exports will be found under BUSHIRE, vol. iv. Shiraz is the capital, and Firusabad, Darabjird, and Bebahan are towns of some importance. Most of the villages are mere collections of mud-built huts, and present a very poverty-stricken appearance, in striking contrast to the splendor of the ancient cities of Shakpur, Pasargadæ, and Persepolis, which lie within the province. No satisfactory estimate of the population can be given.

FASANO, a town of Italy, in the circondario and province of Bari, 32 miles S. of Bari, and a little to the W. of the railway to Brindisi. It stands in a rich olive district, and has a good trade in the produce. During summer the plague of flies is such that the inhabitants retire to a hill in the neighborhood, called La Selva, where there is already a considerable suburb growing up. The ancient Egnatia stood in this vicinity. Population 14,800.

FASTI, plural of the adjective *fastus*, but more commonly used as a substantive, is derived, according to Varro, from *fas*, meaning what is binding, or allowable, by divine law, as opposed to *jus*, or human law. *Fasti dies* thus came to mean the days on which law business might be transacted (see Ovid, *Fasti*, i. 48) *sine piaculo*, thus corresponding to our own "lawful days." Originally the fasti were a kind of official year-book, or almanac, with dates and directions for religious ceremonies, court-days, market-days, divisions of the month, and the like. Festus Pompeius calls them *totius anni descriptio*. In later times they meant state records in general. The fasti, again, were of two distinct kinds—*kalendaria*, or *fasti kalendares*, subdivided into *urbani* and *rustici*, and next, *fasti magistrales*, or *historici*. Until 314 B.C. the lore of the *kalendaria* remained the exclusive and lucrative monopoly of the priesthood; but in that year Cn. Flavius, a pontifical secretary, introduced the custom of publishing in the forum tables containing the requisite information, besides brief references to victories, triumphs, prodigies, etc. These tables were also called fasti. Ovid's *Fasti* have been well described as "a poetical year-book" illustrating the fasti published by Julius Cæsar when he remodelled the Roman year. In the tables of Flavius, the letters F., N., N.P., F.P., Q. Rex C.F., C., EN., stood for *fastus, nefastus, nefastus priore* (in the first half of the day), *fastus priore, quando rex sacrorum comitiavit fastus, comitialis* and *intercisus*. The *dies intercisi* were partly *fasti* and partly *nefasti*. Upon the cultivators fewer feasts, sacrifices, ceremonies, and holidays were enjoined than on the inhabitants of cities; and the rustic fasti contained little more than the ceremonies of the kalends, nones, and ides, the fairs, signs of zodiac, increase and decrease of the days, the tutelary gods of each month, and certain directions for rustic labors to be performed each month. The *fasti magistrales* were concerned with the several feasts, and everything relating to the gods, religion, and the magistrates; to the emperors, their birthdays, offices, days consecrated to them, with feasts and ceremonies established in their honor, or for their prosperity. They came to be denominated *magni*, by way of distinction from the bare kalendar, or *fasti kalendares*. Of this class, the *fasti consulares*, for example, were a chronicle or register of time, in which the several years were denoted by the respective consuls, with the principal events which happened during their consulates. A famous specimen of the same class are the *fasti Capitolini*, so called because they were deposited in the Capitol by Alexander Farnese, after their excavation from the Roman forum in 1547. They are chiefly a nominal list of statesmen, victories, triumphs, etc., from the expulsion of the kings to the death of Augustus. A considerable number of fasti of the first class have also been discovered; but none of them appear to be older than the time of Augustus. The Prænestine calendar, discovered in 1770, contains the months of January, March, April, and December, and a portion of February. The tablets give an account of festivals, as also of the triumphs of Augustus and Tiberius. But some kinds of fasti included under the second general head were, from the very beginning, written for publication. The *Annales Pontificum*—different from the *kalendaria* properly so called—were "annually exhibited in public on a white table, on which the memorable events of the year, with special mention of the prodigies, were set down in the briefest possible manner. Any one was allowed to copy them" (Teuffel's *History*). Like the pontifices, the augurs also had their books, *libri augurales*. In fact, all the state offices had their fasti corresponding in character to the consular fasti named above.

For details of *fasti* and their discovery, see the great work of Foggini, published at Rome in 1779. Watt's *Bibliotheca Britannica* contains a long list of references to authorities on the subject. See also Cruttwell's *History of Roman Literature*, 1877. An admirable summary on *fasti*, with numerous bibliographical references, is given in Teuffel's *Geschichte des Römischen Literatur*, 1870,—translated by Wagner under the title of *A History of Roman Literature*, 1873.

FASTING (*νηστεύειν*, *jejunare*) is most accurately defined as a withholding of meat, drink, and all natural food from the body for a determined period. So it is defined by the Church of England, in the 16th homily, on the authority of the Council of Chalcedon[1] and of the primitive church generally. In a looser sense the word is employed to denote abstinence from certain kinds of food merely; and this meaning, which in ordinary usage is probably the more prevalent, seems also to be at least tolerated by the Church of England when it speaks of "fast or abstinence days," as if fasting and abstinence were synonymous.[2] More vaguely still, the word is occasionally used as an equivalent for moral self-restraint generally. This secondary and metaphorical sense (*νηστεύειν κακότητος*) occurs in one of the fragments of Empedocles.

For the physiological aspects of the subject the reader may consult the article DIETETICS (vol. vii. pp. 183, 184).

Fasting is of special interest when considered as a discipline voluntarily submitted to for moral and religious ends. As such it is very widely diffused. Its modes and motives vary considerably according to climate, race, civilization, and other circumstances; but it would be difficult to name any religious system of any description in which it is wholly unrecognized.[3] The origin of the practice is very obscure.[4] Mr. Herbert Spencer has collected, from the accounts we have of various savage tribes in widely separated parts of the globe, a considerable body of evidence tending to suggest that it may have arisen out of the custom of providing refreshments for the dead, either by actually feeding the corpse, or by leaving eatables and drinkables for its use. The offerings to the dead are often made in so lavish a manner as necessarily to involve the survivors in temporary starvation, and it is no uncommon thing for a man to ruin himself by a funeral feast. It is suggested that the fasting which was at first the natural and inevitable result of such sacrifice on behalf of the dead may eventually have come to be regarded as an indispensable concomitant of all sacrifice, and so have survived as a well-established usage long after the original cause had ceased to operate.[5] It is not pretended that this explanation is sufficient to account satisfactorily for all the known cases of primitive fasting; indeed its extreme precariousness at once becomes evident when it is remembered that, now at least, it is usual for religious fasts to precede rather than to follow sacrificial and funeral feasts, if observed at all in connection with these. Mr. Spencer himself (p. 284) admits that "probably the practice arises in more ways than one," and proceeds to supplement the theory already given by another—that adopted by Mr. E. B. Tylor—to the effect that it originated in the desire of the primitive man to bring on at will certain abnormal nervous conditions favorable to the seeing of those visions and the dreaming of those dreams which are supposed to give the soul direct access to the objective realities of the spiritual world.[6] Probably, if we leave out of sight the very numerous and obvious cases in which fasting, originally the natural reflex result of grief, fear, or other strong emotion, has come to be the usual conventional symbol of these, we shall find that the practice is generally resorted to, either as a means of somehow exalting the higher faculties at the expense of the lower, or as an act of homage to some object of worship. The axiom of the Amazulu that the "continually stuffed body cannot see secret things" meets even now with pretty general acceptance; and if the notion that it is precisely the food which the worshipper foregoes that makes the deity more vigorous to do battle for his human friend be confined only to a few scattered tribes of savages, the general proposition that "fasting is a work of reverence toward God" may be said to be an article of the Catholic faith.[7]

Although fasting as a religious rite is to be met with almost everywhere, there are comparatively few religions, and those only of the more developed kind, which appoint definite public fasts, and make them binding at fixed seasons upon all the faithful. Brahmanism, for example, does not appear to enforce any stated fast upon the laity.[8] Among the ancient Egyptians fasting seems to have been associated with many religious festivals, notably with that of Isis (Herod. ii. 40), but it does not appear that, so far as the common people were concerned, the observance of these festivals (which were purely local) was compulsory. The *νηστεία* on the third day of the Thesmophoria at Athens was observed only by the women attending the festival (who were permitted to eat cakes made of sesame and honey). It is doubtful whether the fast mentioned by Livy (xxxvi. 37) was intended to be general or sacerdotal merely.

Jewish Fasts.—While remarkable for the cheerful, non-ascetic character of their worship, the Jews were no less distinguished from all the nations of antiquity by their annual solemn fast appointed to be observed on the 10th day of the 7th month (Tisri), the penalty of disobedience being death. The rules, as laid down in Lev. xvi. 29–34, xxiii. 27–32, and Numb. xxix. 7–11, include a special injunction of strict abstinence ("ye shall afflict your souls"[9]) from evening to evening. This fast was intimately associated with the chief feast of the year. Before that feast could be entered upon, the sins of the people had to be confessed and (sacramentally) expiated. The fast was a suitable concomitant of that contrition which befitted the occasion. The practice of stated fasting was not in any other case enjoined by the law; and it is generally understood to have been forbidden on Sabbath.[10] At the same time, private and occasional fasting being regarded as a natural and legitimate instinct, was regulated rather than repressed. The only other provision about fasting in the Pentateuch is of a regulative nature, Numb. xxx. 14 (13), to the effect that a vow made by a woman "to afflict the soul" may in certain circumstances be cancelled by her husband.

The history of Israel from Moses to Ezra furnishes a large number of instances in which the fasting instinct was obeyed both publicly and privately, locally and nationally, under the influence of sorrow, or fear, or passionate desire. See, for example, Judg. xx. 26; 1 Sam. vii. 6

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[1] "The Fathers assembled there . . . decreed in that council that every person, as well in his private as public fast, should continue all the day without meat and drink, till after the evening prayer. And whosoever did eat or drink before the evening prayer was ended should be accounted and reputed not to consider the purity of his fast. This canon teacheth so evidently how fasting was used in the primitive church as by words it cannot be more plainly expressed." *Of Good Works: and first, of Fasting.*

[2] As indeed they are, etymologically; but, prior to the Reformation, a conventional distinction between *abstinentia* and *jejunium naturale* had long been recognized. "Exceptio eduliorum quorundam portionale jejunium est" (Tertullian).

[3] Confucianism ought perhaps to be named as one. Zoroastrianism is frequently given as another, but hardly correctly. In the Liber *Sad-der* indeed (Porta xxv.) we read, "Cavendum est tibi a jejunio; nam a mane ad vesperam nihil comedere non est bonum in religione nostra;" but according to the Père de Chinon (Lyons, 1671) the Parsee religion enjoins, upon the priesthood at least, no fewer than five yearly fasts. See Hyde, *Veterum Persarum Religio*, p. 449, 548 (ed. 1700).

[4] During the Middle Ages the prevalent notion was that it had its origin in paradise. The germ at least of this idea is to be found in Tertullian, who says: "Acceperat Adam a Deo legem non gustandi de arbore agnitionis boni et mali, moriturus si gustasset; verum et ipse tunc in psychicum reversus . . . facilius ventri quam Deo cessit, pabulo potius quam præcepto annuit, salutem gula vendidit, manducavit denique et periit, salvus alioquin si uni arbusculæ jejunare maluisset" (*De Jejuniis*, c. 3).

[5] *Principles of Sociology*, i. p. 170, 284, 285. Compare the passage in the appendix from Hanusch, *Slavischer Mythus*, p. 408.

[6] Spencer, *Prin. of Sociology*, i. 256, etc.; E. B. Tylor, *Primitive Culture*, i. 277, 402; ii. 372, etc.

[7] Hooker, *E. P.*, v. 72. In the Westminster Assembly's Larger Catechism fasting is mentioned among the duties required by the second commandment.

[8] The Brahmans themselves on the eleventh day after the full moon and the eleventh day after the new "abstain for sixty hours from every kind of sustenance;" and some have a special fast every Monday in November. See Picart, *The Religion and Manners of the Bramins.*

[9] נֶפֶשׁ is here to be taken as substantially equivalent to "desire," "appetite."

[10] See Judith viii. 6. "And yet it may be a question whether they (the Jews) did not always fast upon Sabbath," says Hooker (*E. P.*, v. 72, 7), who gives a curious array of evidence pointing in this direction. He even makes use of Neh. viii. 9–12, which might be thought to tell the other way. Justinian's phrase "Sabbata Judæorum a Mose in omne ævum jejunio dicata" (l. xxxvi. c. 2; comp. Suetonius in Octav. c. 76) may be accounted for by the fact that the day of atonement is called Sabbat Sabbatôn ("a perfect Sabbath").

(where the national fast was conjoined with the ceremony of pouring out water before the Lord); Jer. xxxvi. 6, 9; and 2 Sam. xii. 16.[1] Sometimes the observance of such fasts extended over a considerable period of time, during which, of course, the stricter *jejunium* was conjoined with *abstinentia* (Dan. x. 2). Sometimes they lasted only for a day. In Jonah iii. 6, 7, we have an illustrative example of the rigor with which a strict fast might be observed; and such passages as Joel ii. and Isa. lviii. 5 enable us to picture with some vividness the outward accompaniments of a Jewish fast day before the exile.

During the exile many occasional fasts were doubtless observed by the scattered communities, in sorrowful commemoration of the various sad events which had issued in the downfall of the kingdom of Judah. Of these, four appear to have passed into general use—the fasts of the 10th, 4th, 5th, and 7th months—commemorating the beginning of the siege of Jerusalem, the capture of the city, the destruction of the temple, the assassination of Gedaliah. As time rolled on they became invested with increasing sanctity; and though the prophet Zechariah, when consulted about them at the close of the exile (Zech. viii. 19), had by no means encouraged the observance of them, the rebuilding of the temple does not appear to have been considered an achievement of sufficient importance to warrant their discontinuance. It is worthy of remark that Ezekiel's prophetic legislation contains no reference to any fast day; the book of Esther (ix. 31), on the other hand, records the institution of a new fast on the 13th of the 12th month.

In the post-exile period private fasting was much practised by the pious, and encouraged by the religious sentiment of the time (see Judith viii. 6; Tob. xii. 8, and context; Sirach xxxiv. 26; Luke ii. 37, and xviii. 12). The last reference contains an allusion to the weekly fasts which were observed on the 2d and 5th days of each week, in commemoration, it was said, of the ascent and descent of Moses, at Sinai. The real origin of these fasts and the date of their introduction are alike uncertain; it is manifest, however, that the observance of them was voluntary, and never made a matter of universal obligation. It is probable that the Sadducees, if not also the Essenes, wholly neglected them. The second book (*Seder Moed*) of the Mishna contains two tractates bearing upon the subject of fasting. One (*Yoma*, "the day") deals exclusively with the rites which were to be observed on the great day of expiation or atonement; the other (*Taanith*, "fast") is devoted to the other fasts, and deals especially with the manner in which occasional fasting is to be gone about if no rain shall have fallen on or before the 17th day of Marcheschwan. It is enacted that in such a case the rabbis shall begin with a light fast of three days (Monday, Thursday, Monday), *i.e.*, a fast during which it is lawful to work, and also to wash and anoint the person. Then, in the event of a continued drought, fasts of increasing intensity are ordered; and as a last resort the ark is to be brought into the street and sprinkled with ashes, the heads of the Nasi and Abbeth-din being at the same time similarly sprinkled.[2] In no case was any fast to be allowed to interfere with newmoon or other fixed festival. Another institution treated with considerable fulness in the treatise *Taanith* is that of the אנשי מעמד (*viri stationis*), who are represented as having been laymen severally representing the twenty-four classes or families into which the whole commonwealth of the laity was divided. They used to attend the temple in rotation, and be present at the sacrifices; and as this duty fell to each in his turn, the men of the class or family which he represented were expected in their several cities and places of abode to engage themselves in religious exercises, and especially in fasting. The suggestion will readily occur that here may be the origin of the Christian *stationes*. But neither Tertullian nor any other of the fathers seems to have been aware of the existence of any such institution among the Jews; and very probably the story about it may have been a comparatively late invention. It ought to be borne in mind that the Aramaic portion of the *Megillath Taanith* (a document considerably older than the treatises in the Mishna) gives a catalogue only of the days on which fasting was forbidden. The Hebrew part (commented on by Maimonides) in which numerous fasts are recommended is of considerably later date. See Reland, *Antiq. Hebr.*, p. iv. c. 10; Derenbourg, *Hist. de Palestine*, p. 439.

Practice of the Early Christian Church.—Jesus himself did not inculcate asceticism in His teaching, and the absence of that distinctive element from His practice was sometimes a subject of hostile remark (Matt. xi. 19). We read, indeed, that on one occasion He fasted forty days and forty nights; but the expression, which is an obscure one, possibly means nothing more than that He endured the privations ordinarily involved in a stay in the wilderness. While we have no reason to doubt that he observed the one great national fast prescribed in the written law of Moses, we have express notice that neither He nor His disciples were in the habit of observing the other fasts which custom and tradition had established. See Mark ii. 18, where the correct reading appears to be—"The disciples of John, and the Pharisees, were fasting" (some customary fast). He never formally forbade fasting, but neither did He ever enjoin it. He assumed that, in certain circumstances of sorrow and need, the fasting instinct would sometimes be felt by the community and the individual; what He was chiefly concerned about was to warn His followers against the mistaken aims which His contemporaries were so apt to contemplate in their fasting (Matt. vi. 16–18). In one passage, indeed, He has been understood as practically commanding resort to the practice in certain circumstances. It ought to be noted, however, that Matt. xvii. 21 is probably spurious; and that in Mark ix. 29 the words "and fasting" are omitted by Westcott and Hort as well as by Tischendorf on the evidence of the Cod. Sinaiticus (first hand) and Cod. Vaticanus.[3] The reference to "the fast" in Acts xxvii. 9 has generally been held to indicate that the apostles continued to observe the yearly Jewish fast. But this inference is by no means a necessary one. According to Acts xiii. 2, 3, xiv. 23, they conjoined fasting with prayer at ordinations, and doubtless also on some other solemn occasions; but at the same time the liberty of the Christian "in respect of an holiday, or of the new moon, or of the Sabbath" was strongly insisted on, by one of them at least, who declared that meat whether taken or abstained from commendeth not to God (Col. ii. 16–23; 1 Cor. viii. 8; Rom. xiv. 14–22; 1 Tim. iv. 3–5). The fastings to which the apostle Paul alludes in 2 Cor. vi. 5, xi. 27, were rather of the nature of inevitable hardships cheerfully endured in the discharge of his sacred calling. The words which appear to encourage fasting in 1 Cor. vii. 5 are absent from all the oldest manuscripts and are now omitted by all critics;[4] and on the whole the precept and practice of the New Testament, while recognizing the propriety of occasional and extraordinary fasts, seem to be decidedly hostile to the imposition of any of a stated, obligatory, and general kind.

The usage of the Christian church during the earlier centuries was in this, as in so many other matters, influenced by traditional Jewish feeling, and by the force of old habit, quite as much as by any direct apostolic authority or supposed divine command. Habitual temperance was of course in all cases regarded as an absolute duty; and "the Bridegroom" being absent, the present life was regarded as being in a sense one continual "fast." Fasting in the stricter sense was not unknown; but it is certain that it did not at first occupy nearly so prominent a place in Christian ritual as that to which it afterwards attained. There are early traces of the customary observance of the Wednesday and Friday fasts—the *dies stationum* (Clem. Alex., *Strom.*, vii. 877), and also of a "quadragesimal" fast before Easter. But the very passage which proves the early origin of "quadragesima," conclusively shows how uncertain it was in its character, and how unlike the Catholic "Lent." Irenæus, quoted by Eusebius (v. 24), informs us with reference to the customary yearly celebration of the mystery of the resurrection of our Lord, that disputes prevailed not only with respect to the day, but also with respect to the manner of fasting in connection with it. "For some think that they ought to fast only one day, some two, some more days; some compute their day as consisting of *forty hours* night and day; and this diversity existing among those that observe it is not a matter that has just sprung up in our times, but long ago among those before us." It was not pretended that the apostles had legislated on the matter, but the general and natural feeling that the anniversaries of the crucifixion and the resurrection of Christ ought to be celebrated by Christians took expression in a variety of ways according to the differing tastes of individuals. No other stated fasts, besides those already mentioned, can be adduced from the time before Irenæus; but there was also a tendency—not unnatural in itself, and already sanctioned by Jewish practice—to fast by way of preparation for any season of peculiar privilege. Thus, according to Justin Martyr (*Apol.*, ii. 93), catechumens were accustomed to fast before baptism, and the church fasted with them. To the same feeling the quadragesimal fast which (as already stated) preceded the joyful feast of the resurrection, is to be, in part at least, attributed. As early as the time of Tertullian it was also usual for communicants to prepare themselves by fasting for receiving the eucharist. But that Christian fasts had not yet attained to the exaggerated importance which they afterwards assumed is strikingly shown in the well-known *Shepherd of Hermas* (lib. iii. sim. v.), where it is declared that "with merely outward fasting nothing is done for true virtue;" the believer is exhorted chiefly to abstain from evil and seek to cleanse himself from feelings of covetousness, and impurity, and revenge: "on the day that thou fastest content thyself with bread, vegetables, and water, and thank God for these. But reckon up on this day what thy meal would otherwise have cost thee, and give the amount that it comes to to some poor widow or orphan, or to the poor." The right of bishops to ordain special fasts, "ex aliqua sollicitudinis ecclesiasticæ causa" (Tertullian), was also recognized.

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[1] There is, as Graf (*Gesch. Bücher des A. T.*, p. 41) has pointed out, no direct evidence that the fast on the 10th of the 7th month was ever observed before the exile. But the inference which he draws from this silence of the historical books is manifestly a precarious one at best. Bleek calls Lev. xvi. "ein deutliches Beispiel Mosaischer Abfassung" (*Einleitung*, p. 31, ed. 1878).

[2] The allusion to the ark warns us to be cautious in assuming the laws of the Mishna to have been ever in force.

[3] The idea, however, is found in the *Clementine Homilies*, ix. 9 Compare Tertullian *De Jejuniis*, c. 8. "Docuit etiam adversus diriora dæmonia jejuniis præliandum."

[4] On the manuscript evidence the words "I was fasting," in Acts x. 30, must also be regarded as doubtful. They are rejected by Lachmann, Tregelles, and Tischendorf.

Later Practice of the Church.—According to an expression preserved by Eusebius (*H. E.*, v. 18), Montanus was the first to give laws (to the church) on fasting. Such language, though rhetorical in form, is substantially correct. The treatise of Tertullian,—*Concerning Fasting: against the Carnal*,—written as it was under Montanistic influence, is doubly interesting, first as showing how free the practice of the church down to that time had been, and then as foreshadowing the burdensome legislation which was destined to succeed. In that treatise (c. 15) he approves indeed of the church practice of not fasting on Saturdays and Sundays (as elsewhere, *De Corona*, c. 3, he had expressed his concurrence in the other practice of observing the entire period between Easter and Pentecost as a season of joy); but otherwise he evinces great dissatisfaction with the indifference of the church as to the number, duration, and severity of her fasts.[1] The church thus came to be more and more involved in discussions as to the number of days to be observed, especially in "Lent," as fast days, as to the hour at which a fast ought to terminate (whether at the 3d or at the 9th hour), as to the rigor with which each fast ought to be observed (whether by abstinence from flesh merely, *abstinentia*, or by abstinence from lacticinia, *xerophagia*, or by literal *jejunium*), and as to the penalties by which the laws of fasting ought to be enforced. Almost a century, however, elapsed between the composition of the treatise of Tertullian (*cir.* 212) and the first recorded instances of ecclesiastical legislation on the subject. These while far from indicating that the church had attained unanimity on the points at issue, show progress in the direction of the later practice of catholicism. About the year 306 the synod of Illiberis in its 26th canon decided in favor of the observance of the Saturday fast.[2] The council of Ancyra in 314, on the other hand, found it necessary to legislate in a somewhat different direction,—by its 14th canon enjoining its priests and clerks at least to taste meat at the love feasts.[3] The synod of Laodicea framed several rules with regard to the observance of "Lent," such as that "during Lent the bread shall not be offered except on Saturday and Sunday" (can. 49), that "the fast shall not be relaxed on the Thursday of the last week of Lent, thus dishonoring the whole season; but the fast shall be kept throughout the whole period" (can. 50), that "during the fast no feasts of the martyrs shall be celebrated" (can. 51), and that no wedding or birthday feasts shall be celebrated during Lent" (can. 52). The synod of Hippo (393 A. D.) enacted that the sacrament of the altar should always be taken fasting, except on the Thursday before Easter. Protests in favor of freedom were occasionally raised, not always in a very wise manner, or on very wise grounds, by various individuals such as Eustathius of Sebaste (*c.* 350), Aerius of Pontus (*c.* 375), and Jovinian, a Roman monk (*c.* 388). Of the Eustathians, for example (whose connection with Eustathius can hardly be doubted), the complaint was made that "they fast on Sundays, but eat on the fast-days of the church." They were condemned by the synod of Gangra in Paphlagonia (*cir.* 860) in the following canons:—Can. 19, "If any one fast on Sunday, let him be anathema."[4] Can. 20, "If any one do not keep the fasts universally commanded and observed by the whole church, let him be anathema." Jovinian was very moderate. He "did not allow himself to be hurried on by an inconsiderate zeal to condemn fasting, the life of celibacy, monachism, considered purely in themselves. . . . He merely sought to show that men were wrong in recommending so highly and indiscriminately the life of celibacy and fasting, though he was ready to admit that both under certain circumstances might be good and useful" (Neander). He was nevertheless condemned (390) both by Pope Siricius at a synod in Rome, and by Ambrose at another in Milan. The views of Aerius, according to the representations of his bitter opponent Epiphanius (*Hær.* 75, "Adv. Aerium"), seem on this head at least, though unpopular, to have been characterized by great wisdom and sobriety. He did not condemn fasting altogether, but thought that it ought to be resorted to in the spirit of gospel freedom according as each occasion should arise. He found fault with the church for having substituted for Christian liberty a yoke of Jewish bondage.[5]

Towards the beginning of the 5th century we find Socrates (439) enumerating (*H. E.*, v. 22) a long catalogue of the different fasting practices of the church. The Romans fasted three weeks continuously before Easter (Saturdays and Sundays excepted). In Illyria, Achaia, and Alexandria the quadragesimal fast lasted six weeks. Others (the Constantinopolitans) began their fasts seven weeks before Easter, but fasted only on alternate weeks, five days at a time. Corresponding differences as to the manner of abstinence occurred. Some abstained from all living creatures; others ate fish; others fish and fowl. Some abstained from eggs and fruit; some confined themselves to bread; some would not take even that. Some fasted till three in the afternoon, and then took whatever they pleased. "Other nations," adds the historian, "observe other customs in their fasts, and that for various reasons. And since no one can show any written rule about this, it is plain the apostles left this matter free to every one's liberty and choice, that no one should be compelled to do a good thing out of necessity and fear." When Leo the Great became pope in 440, a period of more rigid uniformity began. The imperial authority of Valentinian helped to bring the whole West at least into submission to the see of Rome; and ecclesiastical enactments had, more than formerly, the support of the civil power. Though the introduction of the four Ember seasons was not entirely due to him, as has sometimes been asserted, it is certain that their widespread observance was due to his influence, and to that of his successors, especially of Gregory the Great. The tendency to increased rigor may be discerned in the 2d canon of the synod of Orleans (541), which declares that every Christian is bound to observe the fast of Lent, and, in case of failure to do so, is to be punished according to the laws of the church by his spiritual superior; in the 9th canon of the synod of Toledo (653), which declares the eating of flesh during Lent to be a mortal sin; in Charlemagne's law for the newly conquered Saxony, which attaches the penalty of death to wanton disregard of the holy season.[1] Baronius mentions that in the 11th century those who ate flesh during Lent were liable to have their teeth knocked out. But it ought to be remembered that this severity of the law early began to be tempered by the power to grant dispensations. The o-called Butter Towers (Tours de beurre) of Rouen, 1485–507, Bourges, and other cities, are said to have been built with money raised by sale of dispensations to eat lacticinia on fast days.

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[1] Quinam isti (adversarii) sint, semel nominabo: exteriores et interiores botuli psychicorum. . . . Arguunt nos quod *jejunia propria* custodiamus, quod stationes plerumque in vesperam *producamus*, quod etiam *xerophagias* observemus, siccantes cibum ab omni carne et omni jurulentia et uvidioribus quibusque pomis, nec quid vinositatis vel edamus vel potemus; lavacri quoque abstinentiam congruentem arido victui.

[2] The language of the canon is ambiguous; but this interpretation seems to be preferable, especially in view of canon 23, which enacts that jejunii superpositiones are to be observed in all months except July and August. See Hefele, *Councils*, i. 148 (Engl. trs.).

[3] Compare the 52d [51st] of the Apostolical canons. "If any bishop or presbyter or deacon, or indeed any one of the sacerdotal catalogue, abstains from flesh and wine, not for his own exercise but out of hatred of the things, forgetting that all things were very good, . . . either let him reform, or let him be deprived and be cast out of the church. So also a layman." To this particular canon Hefele is disposed to assign a very early date.

[4] Compare canon 64 of the (supposed) fourth synod of Carthage: "He who fasts on Sunday is not accounted a Catholic" (Hefele, ii. 415).

[5] Priscillian, whose widespread heresy evoked from the synod of Saragossa (418) the canon, "No one shall fast on Sunday, nor may any one absent himself from church during Lent and hold a festival of his own," appears, on the question of fasting, not to have differed from the Encratites and various other sects of Manichean tendency (c. 406).

It is probable that the apparent severity of the mediæval Latin Church on this subject was largely due to the real strictness of the Greek Church, which, under the patriarch Photius in 864, had taken what was virtually a new departure in its fasting praxis. The rigor of the fasts of the modern Greek Church is well known; and it can on the whole be traced back to that comparatively early date. Of the nine fundamental laws of that church (*ἐννέα παραγγέλμάτα τῆς ἐκκλησίας*) two are concerned with fasting. Besides fasts of an occasional and extraordinary nature, the following are recognized as of stated and universal obligation:—(1) The Wednesday and Friday fasts throughout the year (with the exception of the period between Christmas and Epiphany, the Easter week, the week after Whitsunday, the third week after Epiphany); (2) The great yearly fasts, viz., that of Lent, lasting 48 days, from the Monday of Sexagesima to Easter eve; that of Advent, 39 days, from November 15th to Christmas eve; that of the Theotokos (*νηστεία τῆς θεοτόκου*), from August 1st to August 15th; that of the Holy Apostles, lasting a variable number of days from the Monday after Trinity; (3) The minor yearly fasts before Epiphany, before Whitsunday, before the feasts of the transfiguration, the invention of the cross, the beheading of John the Baptist. During even the least rigid of these the use of flesh and lacticinia is strictly forbidden; fish, oil, and wine are occasionally conceded, but not before two o'clock in the afternoon. The practice of the Coptic church is almost identical with this. A week before the Great Fast (Lent), a fast of three days is observed in commemoration of that of the Ninevites, mentioned in the book of Jonah. Some of the Copts are said to observe it by total abstinence during the whole period. The Great Fast continues fifty-five days; nothing is eaten except bread and vegetables, and that only in the afternoon, when church prayers are over. The Fast of the Nativity lasts for twenty-eight days before Christmas; that of the Apostles for a variable number of days from the Feast of the Ascension; and that of the Virgin for fifteen days before the Assumption. All Wednesdays and Fridays are also fast days except those that occur in the period between Easter nd Whitsunday. The Armenians are equally strict; but adds Rycaut) "the times seem so confused and without ule that they can scarce be recounted, unless by those who live amongst them, and strictly observe them, it being the chief care of the priest, whose learning principally consists in knowing the appointed times of fasting and feasting, the which they never omit on Sundays to publish unto the people."[2]

At the council of Trent no more than a passing allusion was made to the subject of fasting. The faithful were simply enjoined to submit themselves to church authority on the subject; and the clergy were exhorted to urge their flocks to the observance of frequent jejunia, as conducive to the mortification of the flesh, and as assuredly securing the divine favor. Bellarmine (*De jejunio*) distinguishes jejunium spirituale (abstinentia a vitiis), jejunium morale (parsimonia et temperantia cibi et potus), jejunium naturale (abstinentia ab omni prorsus cibo et potu, quacunque ratione sumpto), and jejunium ecclesiasticum. The last he defines simply as an abstinence from food in conformity with the rule of the church. It may be either voluntary or compulsory; and compulsory either because of a vow or because of a command. But the definition given by Alexander Halensis, which is much fuller, still retains its authority:—"Jejunium est abstinentia a cibo et potu secundum formam ecclesiæ, intuitu satisfaciendi pro peccato et acquirendi vitam æternam." It was to this last clause that the Reformers most seriously objected. They did not deny that fasting might be a good thing, nor did they maintain that the church or the authority might not ordain fasts, though they deprecated the imposition of needless burdens on the conscience. What they protested against was the theory of the opus operatum et meritorium as applied to fasting. As matter of fact, the Reformed churches in no case gave up the custom of observing fast days, though by some churches the number of such days was greatly reduced. In many parts of Germany, the seasons of Lent and Advent are still marked by the use of emblems of mourning in the churches, by the frequency of certain phrases (Kyrie eleison, Agnus Dei) and the absence of others (Hallelujah, Gloria in excelsis) in the liturgical services, by abstinence from some of the usual social festivities, and by the non-celebration of marriages. And occasional fasts are more or less familiar. The Church of England has retained a considerable list of fasts; though Hooker (*E. P.*, v. 72) had to contend with some who, while approving of fastings undertaken "of men's own free and voluntary accord as their particular devotion doth move them thereunto," yet "yearly or weekly fasts such as ours in the Church of England they allow no further than as the temporal state of the land doth require the same for the maintenance of seafaring men and preservation of cattle; because the decay of the one and the waste of the other could not well be prevented but by a politic order appointing some such usual change of diet as ours is."

In the practice of modern Catholicism the following are recognized as fasting days, that is to say, days on which one meal only, and that not of flesh, may be taken in the course of twenty-four hours:—The forty days of Lent (Sundays excepted), all the Ember days, the Wednesdays and Fridays in Advent, and the vigils of certain feasts, namely, those of Whitsuntide, of St. Peter and St. Paul, of the Assumption of the Blessed Virgin Mary, of All Saints, and of Christmas day. The following are simply days of abstinence, that is to say, days on which flesh at all events must not be eaten:—The Sundays in Lent, the three Rogation days, the feast of St. Mark (unless it falls in Easter week), and all Fridays which are not days of fasting. In the English Church, the "days of fasting or abstinence" are the forty days of Lent, the Ember days, the Rogation days, and all the Fridays in the year, except Christmas day. The evens or vigils before Christmas, the Purification of the Blessed Virgin Mary, the Annunciation of the Blessed Virgin Mary, Easter day, Ascension day, Pentecost, St. Matthias, the Nativity of St. John Baptist, St. Peter, St. James, St. Bartholomew, St. Matthew, St. Simon and St. Jude, St. Andrew, St. Thomas, and All Saints are also recognized as "fast days." By the 64th canon it is enacted that "every parson, vicar, or curate, shall in his several charge declare to the people every Sunday at the time appointed in the communion-book [which is, after the Nicene creed has been repeated] whether there be any holy-days or fast-days the week following." The 72d canon ordains that "no minister or ministers shall, without license and direction of the bishop under hand and seal, appoint or keep any solemn fasts, either publicly or in any private houses, other than such as by law are or by public authority shall be appointed, nor shall be wittingly present at any of them under pain of suspension for the first fault, of excommunication for the second, and of deposition from the ministry for the third." While strongly discouraging the arbitrary multiplication of public or private fasts, the English Church seems to leave to the discretion of the individual conscience every question as to the manner in which the fasts she formally enjoins are to be observed. In this connection the homily *Of Fasting* may be again referred to. By a statute of the reign of Queen Elizabeth it was enacted that none should eat flesh on "fish days" (the Wednesdays, Fridays, and Saturdays throughout the year) without a license, under a penalty. In the Scottish Presbyterian churches days of "fasting, humiliation, and prayer" are observed by ecclesiastical appointment in each parish once or twice every year on some day of the week preceding the Sunday fixed for the administration of the sacrament of the Lord's Supper. In some of the New England States, it has been usual for the governor to appoint by proclamation at some time in spring a day of fasting, when religious services are conducted in the churches. National fasts have more than once been observed on special occasions both in this country and in the United States of America.

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[1] Cap. iii. pro partib. Saxoniæ: "Si quis sanctum quadragesimale jejunium pro despectu Christianitatis contempserit et carnem comederit, morte moriatur. Sed tamen consideretur a sacerdote ne forte causa necessitatis hoc cuilibet proveniat, ut carnem comedat." See Augusti, *Christliche Archäologie*, x. p. 374.

[2] See Fink's article "Fasten" in Ersch and Gruber's *Encyclopädie*; Lane, *Modern Egyptians*; and Rycaut, *Present State of the Armenian Church.*

On the subject of fasting the views of Aerius are to a large extent shared by modern Protestant moralists. Rothe, for example, who on this point may be regarded as a representative thinker, rejects the idea that fasting is a thing meritorious in itself, and is very doubtful of its value even as an aid to devotional feeling. Of course when bodily health and other circumstances require it, it becomes a duty; and as a means of self-discipline it may be used with due regard to the claims of other duties, and to the fitness of things. In this last aspect, however, habitual temperance will generally be found to be much more beneficial than occasional fasting. It is extremely questionable, in particular, whether fasting be so efficient as it is sometimes supposed to be in protecting against temptation to fleshly sin. The practice has a well ascertained tendency to excite the imagination; and in so far as it disturbs that healthy and well-balanced interaction of body and mind which is the best, or at least the normal, condition for the practice of virtue, it is to be deprecated rather than encouraged (*Theologische Ethik*, sec. 873–875).

Mahometan Fasts.—Among the Mahometans, the month Ramadan, in which the first part of the Koran is said to have been received, is by command of the prophet observed as a fast with extraordinary rigor. No food or drink of any kind is permitted to be taken from daybreak until the appearance of the stars at nightfall. Extending as it does over the whole "month of raging heat," such a fast manifestly involves considerable self-denial; and it is absolutely binding upon all the faithful whether at home or abroad. Should its observance at the appointed time be interfered with by sickness or any other cause, the fast must be kept as soon afterwards as possible for a like number of days. It is the only one which Mahometanism enjoins; but the doctors of the law recommend a considerable number of voluntary fasts, as, for example, on the tenth day of the month Moharram. This day, called the "Yom Ashoora," is held sacred on many accounts:—"because it is believed to be the day on which the first meeting of Adam and Eve took place after they were cast out of paradise; and that on which Noah went out from the ark; also because several other great events are said to have happened on this day, and because the ancient Arabs, before the time of the prophet, observed it by fasting. But what, in the opinion of most modern Moslems, and especially the Persians, confers the greatest sanctity on the day of Ashoora is the fact of its being that on which El-Hoseyn, the prophet's grandson, was slain a martyr at the battle of the plain of Karbala." It is the practice of many Moslems to fast on this day, and some do so on the preceding day also. Mahomet himself called fasting the "gate of religion," and forbade it only on the two great festivals, namely, on that which immediately follows Ramadan and on that which succeeds the pilgrimage. See Lane, *Modern Egyptians*, chaps. iii., xxiv. (J. S. BL.)

FASTING, CLAUS (1746–1791), a Danish poet, was born at Bergen in Norway on the 29th of October, 1746. In 1762 he came to reside in Copenhagen. He very early took an active part in letters, and was among the foremost champions of the romantic revival against French taste and the overpowering affectation of Klopstock, then personally reigning in the Danish capital. Fasting edited a brilliant æsthetic journal, the *Kritiske Tilskuer*, or Critical Observer, and in 1772 he formed in Copenhagen the Norwegian Society, a sort of literary club, which included among its members all the best young talent of the time. Soon after this, however, he returned to his native town, and from 1778 to 1781 edited there a journal entitled *Provinzialblade*, or Provincial Pages, in which he published most of his poems. In 1783 he was made a member of the municipal council of Bergen, and there he died in 1791. His works were first edited in 1837, when they were issued in one volume, with a biographical study by Lyder Sagen.

FATES, in Latin mythology, a name given to certain beings who, by euphemism similar to that which gave to the Greek ERINYES (*q. v.*) the name of Eumenides, were also known as Parcæ, or the Merciful. Originally the one Fatum, or *spoken word* of Jupiter, answered precisely to the single Aisa, the *spoken word* of Zeus, in the mythology of the Greeks. The conversion of one Fate into three had reference to the distinction of time into the past, present, and future; and thus the Fates answer to the Teutonic Norns or Weird Sisters.

FATHERS OF THE CHURCH. Ecclesiastically the word "father" is used in a variety of secondary significations. In the Old Testament even we find the name applied to priests (Judg. xvii. 10, xviii. 19), and to prophets (2 Kings ii. 12, vi. 21, xiii. 14), as well as to kings (2 Kings v. 13); and in the days of later Judaism there was a definite office which was known as that of the Father of the Synagogue.[1] In the Christian church almost every kind of spiritual relationship in which age or authority was in any way implied came to be expressed by some word denoting paternity. Thus we find such names as abba, papa, pater, bestowed occasionally upon godfathers, confessors, instructors, and almost invariably upon bishops and heads of monasteries. The decrees of the council of Nice are often referred to as those of the 318 fathers. The expression "church fathers" (patres ecclesiastici), however, has come to be used in a comparatively definite and restricted sense, as denoting in the aggregate those teachers of the ancient church who, from the close of the apostolic age onwards, either orally or in writing, expounded and defended the orthodox faith, and came to be acknowledged, either by tacit consent or by express declaration of the church, as duly qualified exponents of her doctrines. The title of father is generally held to imply soundness of doctrine, holiness of life, the approval of the church, and undoubted antiquity (Perrone). The word itself is fitted to suggest the idea of age, and also some such notion as that which is expressed in 1 Cor. iv. 15.

The patristic period of the church's history is generally held to begin with the close of the apostolic age; but historians are not agreed as to the date at which it may be said to have closed. Some Roman Catholic writers speak of Bernard, who died in 1153, as having been the "last of the fathers," while Greek patristic is often brought down so far as to the council of Florence. But it is usual to speak of the scholastic period as having begun with Anselm; and there seems to be no good reason for removing Bernard from the list of the schoolmen. As no very important author either in Latin or in Greek can be assigned to the centuries immediately preceding Anselm, it may therefore be said, roughly speaking, that the patristic period practically closed for the Eastern Church with Joannes Damascenus, and for the Western with Gregory the Great.

The patristic canon has never been quite definitely fixed, and no precise line of demarcation can be drawn between those ancient teachers of Christianity who are and those who are not entitled to be reckoned "fathers." The name is often bestowed on some whose title, when viewed from the standpoint of rigid orthodoxy, cannot but be regarded as somewhat doubtful. While Arius and Eusebius of Nicomedia have obviously no title to be called "fathers," it has not been thought necessary to withhold the honorable appellation from Origen or Tertullian.[2] The authors usually named as fathers may be arranged according to chronology into three groups, called respectively the apostolic, the primitive, and the post-Nicene. The apostolic fathers,—that is to say, the fathers who were to some extent contemporary with the apostles,—are Clement of Rome, Ignatius, Polycarp, the author of the *Shepherd of Hermas*, and the author of the *Epistle of Barnabas* (see APOSTOLIC FATHERS). The chief primitive or ante-Nicene fathers are Irenæus, Justin Martyr, Origen, Clement of Alexandria, Cyprian, Tertullian, Gregory Thaumaturgus. Among the post-Nicene fathers may be mentioned Ambrose, Athanasius, Augustine, Basil, Chrysostom, Cyril of Jerusalem, Cyril of Alexandria, Epiphanius, Gregory of Nazianzum, Gregory of Nyssa, Gregory the Great, Hilary, Jerome, and Leo. A distinction is usually recognized between the patres and those who were merely scriptores ecclesiastici, and it is to the latter category that such writers as Eusebius and Socrates the historians most properly belong. The Eastern and the

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[1] See the rescript of Constantine (in the *Codex Theodosianus*) referred to and discussed by Vitringa, *De Syn. Vet.* lib. ii. c. 5.

[2] See Perrone, *Loci Theologici*, p. ii. sect. ii. cap ii., De sanctis patribus.

Western Church have each four authors of note whom they recognize as fathers *par excellence.* Those of the Eastern are Athanasius, Basil, Chrysostom, and Gregory of Nazianzum. Those of the Western are Jerome, Ambrose, Augustine, and Gregory—the fathers respectively of her monastic system, of her sacerdotal authority, of her scientific theology, and of her popular religion (Milman, *Latin Christianity*, b. ii. c. 4).

The study of the fathers has sometimes been regarded as constituting a distinct discipline called patrology or patristic, which, however, practically resolves itself into the church history of the first six centuries. For information on the individual fathers and on the influence they exerted upon one another and upon the thought and life of the church the reader is referred to the various articles, biographical, archæological, and historical, relating to that period.

The much-disputed question as to the authority of the fathers resolves itself into the more general one as to the place of tradition considered as a source of dogma and a rule of life apart from the Scriptures (see vol. v. p. 663). There seems to be no sufficient evidence for the statement made by Turrettin and others to the effect that some Catholic writers set the writings of the fathers individually on a level with the canonical Scriptures; and it is certainly an exaggeration to say that Cardinal Cajetan regarded them as having no authority at all.[1] The Tridentine doctrine is that no one is entitled to interpret Scripture in a sense contrary to the interpretations of holy mother church or to the *unanimous* consent of the fathers.[2] Roman Catholic writers accordingly as a rule attach comparatively little weight to the peculiarities of individual fathers, and hold themselves committed to nothing that is not established by what they consider to be unanimous and unvarying tradition. They distinguish, moreover, between the function of the fathers as witnesses and their function as instructors. As witnesses to the tradition and teaching of the church, they give testimony which is binding on the Catholic conscience; as independent teachers, they are entitled to be listened to with deference and respect, but their interpretations and arguments are to be freely accepted or as freely rejected according to their merits.[3] Protestant writers, while fully admitting the merits, literary and other, of many of the fathers, usually dwell much upon the admitted fact of their fallibility, and strive to show that the attempt to establish an unambiguous tradition by their means is in very many cases much more illusory than Catholic writers are disposed to allow.[4] They do not, however, deny that on many important points there is such a thing as a consensus patrum; but this they regard as having at best no other authority than what is merely human and ecclesiastical, the Bible alone being the supreme rule of faith and life. The fundamental Protestant antithesis to the Tridentine doctrine according to which the canonical books and the traditions preserved by the church are to be received and reverenced "pari pietatis effectu ac reverentia" is very clearly expressed in the sixth Article of the Church of England, which declares that "Holy Scripture containeth all things necessary to salvation; so that whatsoever is not read therein nor may be proved thereby is not to be required of any man that it should be believed as an article of faith, or be thought requisite or necessary to salvation."

The first writer in patrology may be said to have been Jerome, himself one of the greatest of the fathers. His work, *De Viris Illustribus, sive Catalogus scriptorum ecclesiasticorum*, was reprinted, along with the similar works of Gennadius of Marseilles, Isidore of Seville, and Ildefonso of Toledo, by Fabricius in his *Bibliotheca Ecclesiastica* (1718). Among modern writers on this subject Möhler (*Patrologie*, 1842), Alzog (*Grundriss der Patrologie*, 1866), Engelhardt (*Litterarische Leitfaden zu Vorlesungen über die Patristik*, 1823), and J. E. L. Danz (*Initia doctrinæ patristicæ*, 1839) may be referred to. See also Cave's *Apostolici* (1677) and *Ecclesiastici* (1683), Ittigii *Tractatus de Bibl. Patr.* (Lips. 1707), and Dowling's *Notitia Scriptorum SS. Patrum* (Oxon. 1839). The most important collective editions of the fathers are the Latin *Magna Bibliotheca Veterum Patrum* of De la Bigne (Paris, 1575), of which the *Maxima Bibliotheca* (Lyons, 1677) is an improved reprint, and the exhaustive *Patrologiæ cursus completus* of Migne, in which the collection of Latin authors, brought down to the time of Innocent III., occupies 221 volumes (Paris, 1844–1855), while the Greek division, extending to the council of Florence, is completed in 166 vols. (Paris, 1857–1866). (J. S. BL.)

FATHIPUR, or FUTTEHPOOR, a district of British India in the Allahábád division, under the jurisdiction of the lieutenant-governor of the North-Western Provinces, lies between 25° 26′ 15″ and 26° 13′ 0″ N. lat., and 80° 19′ 0″ and 81° 25′ 0″ E. long. It is bounded on the N. by Rái Bareli and Sultánpur, E. by Allahábád, S. by Hamírpur and Bandá, and W. by Cawnpur. Fathipur district is situated in the extreme south-eastern corner of the *duáb* or tract of the country between the Ganges and the Jumna, which respectively mark its northern and southern boundary. The whole district consists of an alluvial plain formed by the deposits of the two great rivers. The central part is almost perfectly level, and consists of highly cultivated land, interspersed with tracts impregnated with saltpetre (*usar*) and jungle. A ridge of higher land, forming the watershed of the district, runs along it from east to west at an average distance of about five miles from the Ganges. Fathipur therefore consists of two inclined planes, the one five miles broad, sloping down rapidly to the Ganges, and the other, from fifteen to twenty miles broad, falling gradually to the Jumna. The country near the banks of the two rivers is cut up into ravines and *nalás* running in all directions, and is almost entirely uncultivable. Besides the Ganges and Jumna, the only rivers of importance are the Pándú, a tributary of the Ganges, and the Rind and Nún, which both fall into the Jumna. The census of 1872 returned the population of Fathipur at 663,877, of whom 593,256 were Hindus, 70,554 Mahometans, and 5 Christians. The area of the district is 1586 square miles, of which 871 are returned as cultivated, and 172 as cultivable. Two harvests are gathered during the year, the *kharif* or autumn crop, consisting chiefly of rice, *joár*, and *bájrá*, and the *rabí* or spring crop, consisting principally of wheat, barley, gram, oats, pease, etc. The principal lines of road are the grand trunk road, which runs through the whole length of the district from east to west, the Mughál road to Khajwá, and the Bandá road. The East Indian railway runs through the district parallel to the grand trunk roads, having stations at Khága, Barhampur, Fathipur, Malwa, and Mohar.

The civil station and principal town is Fathipur, situated on the grand trunk road in 25° 57′ N. lat. and 80° 54′ E. long.; population 19,879. It is also constituted a municipality, the municipal income in 1875 amounting to £1314, and the expenditure to £1196. The town carries on a considerable trade in grain, hides, grease, and soap. The other important trading towns are—Binki, the largest grain and cattle mart in the district; Khajwá, noted for its brass and copper work; Korah, with a trade in metal work, whips, and skins; Náráyani, with a large market for grain and local produce. The revenue of the district in 1876 was £165,409; the expenditure on civil administration, £54,404. The force for the protection of person and property in 1875 consisted of 522 regular police, costing £6732, and 1898 village watchmen, costing £6898. The schools in the district numbered 260 in 1875, attended by 6416 pupils, and costing £2662. The Fathipur charitable dispensary afforded medical relief in 1875 to 410 indoor and 4863 outdoor patients. The climate is more humid than in the other districts of the *duáb*, and although fevers are common, it is not considered an unhealthy district. The average annual rainfall is 35·7 inches.

The tract in which this district is comprised was conquered in 1194 by the Patháns; but subsequently, after a desperate resistance, it was wrested from them by the Mughals. In the 18th century it formed a part of the *subah* of Korah, and was under the government of the vizír of Oudh. In 1765, by a treaty between the East India Company and the nawáb, Korah was made over to the Delhi emperor, who retained it till 1772, when it was again restored to the nawáb vizír's dominions. Finally, in 1801, the nawáb, by treaty, reconveyed it to the company in commutation of the amount which he had stipulated to pay in return for the defence of his country. In June, 1857, the district rose in rebellion, and the usual murders of Europeans took place. Order was established after the fall of Lucknow, on the return of Lord Clyde's army to Cawnpur.

FATHIPUR SIKRI, a town in the Agra district in the

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[1] Turrettin, loc. ii. qu. 21. Möhler, *Symbolik*, sec. 42.

[2] Conc. Trid., sess. iv. Compare the Forma juramenti professionis fidei prepared by Pius IV.

[3] Möhler, *ut sup.*; Perrone, *ut sup.*

[4] Chemnitz, *Examen Concilii Tridentini*, De traditionibus; Daillé, *De usu patrum*; Barbeyrac, *De la Morale des Pères*, and others.

North-Western Provinces of India, on the road from Agra to Jáipur, situated in 27° 58′ N. lat. and 75° 5′ E. long. It is a ruined city, and is interesting only from an archæological point of view. It was founded by Akbar about 1570, as a thank-offering for the birth of a son, Selim, afterwards the emperor Jahangir, obtained through the intercession of a famous Mahometan saint. The principal building is the great mosque, which is said by Fergusson to be hardly surpassed by any in India. "It measures 550 feet east and west by 470 feet north and south, over all. The mosque itself, 250 feet by 80 feet, is crowned by three domes. In its court-yard, which measures 350 feet by 440 feet, stand two tombs. One is that of Selim Chisti [the holy man above mentioned], built of white marble, and the windows with pierced tracery of the most exquisite geometrical patterns. It possesses besides a deep cornice of marble, supported by brackets of the most elaborate design. The other tomb, that of Nawáb Islám Khán, is soberer and in excellent taste, but quite eclipsed by its surroundings. Even these parts, however, are surpassed in magnificence by the southern gateway. As it stands on a rising ground, when looked at from below, its appearance is noble beyond that of any portal attached to any mosque in India, perhaps in the whole world." Fathipur Sikri was a favorite residence of Akbar throughout his reign, and his palace was one of great magnificence. After Akbar's death, Fathipur Sikri was deserted, within 50 years of its foundation. The buildings are situated within a walled inclosure about seven miles in circumference. They are now all more or less in ruins. The town at present contains 8513 inhabitants.

FATIMAH (606–632), the daughter of Mahomet by his wife Khadijah, and one of the four women whom the prophet regarded as perfect, was born at Mecca in 606. At the age of fifteen she was married to Ali, of whom she was the only wife. The Arabian dynasty named Fatimites, which from 909 to 1171 ruled over Egypt and the northern part of Africa, and latterly over Syria and Palestine, claimed to be descended from Fatimah. The religious tenets of their adherents differed considerably from those of the orthodox Mahometans, and latterly they sought to give to the Koran an allegorical interpretation so as to avoid obedience to its literal precepts. See MAHOMET.

FATTORE, IL. See PENNI.

FAUCHER, LÉON (1803–1854), a French statesman and political economist, was of Jewish extraction, and was born at Limoges 8th September, 1803. His parents afterwards removed to Toulouse, and he found the means of supporting himself by the execution of designs for embroidery while attending the college of that place. From Toulouse he went to Paris, where for a short period he followed the profession of private tutor; but on the outbreak of the revolution of 1830 he became immersed in the political struggles of the time and a contributor to the political journals. In 1833 and 1834 he was editor of the *Constitutionnel*, after which he joined the staff of the *Courier*, and in 1839 became its editor. In politics he belonged to the party known as the dynastic left, and he was frequently consulted by the Thiers ministry of 1840. In 1842 the *Courier* changed hands, and on its new proprietors wishing slightly to modify its principles, Faucher resigned the editorship, and from that time devoted his attention almost exclusively to questions of political economy. In 1843 he visited England with the view of studying the social aspects of that country, and in October of the same year he began a series of articles in the *Revue des Deux Mondes*, recording the impressions made by his visit. These papers, though not altogether free from the defects incident to the imperfect knowledge of a foreigner, are characterized not less by shrewdness of observation than by able statement and illustration of economical principles, and form an important contribution towards the solution of the great social questions of the time. Shortly after this he became one of the editors of the *Journal des Economists*, to the pages of which he contributed several valuable papers, more especially on the tariff of customs. He also took a prominent part in the organization of the French association on the model of the free-trade league of England, but on account of the extreme opinions of the majority of its members he soon resigned his connection with it. In 1846, chiefly on account of his advocacy of free-trade doctrines, he was elected member of the chamber of deputies for Rheims, and in the chamber he took a leading part in the discussion of all economical and financial questions. After the revolution of 1848 he became a member of the new assembly for the department of Marne, and in December of the same year he was named minister of public works, and a little later minister of the interior; but he was compelled through the opposition manifested to his measures by the extreme republicans to resign his office 14th May, 1849. On 10th April, 1851, he again accepted the same office from Louis Napoleon, then president of the republic, but when Napoleon resolved to appeal to universal suffrage Faucher again resigned; and after the *coup d'état* he also refused to become a member of the constitutional commission instituted by the emperor. The occurrence of an affection of the throat which gradually assumed an alarming form induced him to pass the summer of 1854 in different parts of the Pyrenees. He had resolved to remain in Italy over the winter, but in November business affairs called him to Paris, and on his way back to Italy he was seized at Marseilles by typhoid fever, and died 14th December. During his whole political career Faucher maintained his probity unsullied, and in very difficult circumstances held with unswerving steadfastness to the path pointed out to him by convictions which were formed solely by a scientific study of political problems and an unprejudiced regard for the welfare of the human race. His economical writings are characterized by clearness of statement, fulness of information, incisiveness of reasoning, and firm grasp of principles. In relation to the cause of free trade in France he occupies, more than any other Frenchman, a position analogous to that occupied by Cobden in relation to the same cause in England; and perhaps both by his writings and by his former relations with Napoleon he had no small share, though an indirect and posthumous one, in bringing about the commercial treaty which through the intervention of Cobden was effected between the two countries in 1860.

The principal writings of Faucher were contributed to the *Revue des Deux Mondes*, and were published posthumously in 2 vols. under the title *Mélanges d'économie politique et de finance*, 1856. Among his other writings the principal are *Recherches sur l'or et sur l'argent, considérés comme étalons de la valeur*, 1843, and *Études sur l'Angleterre*, 2 vols., 1845. The former work and a portion of the latter have been translated into English. A short biography of Faucher, by Léonce de Lavergne, is contained in the *Revue des Deux Mondes* for January, 1855.

FAUCHET, CLAUDE (1530–1601), French historian and antiquary, was born at Paris in 1530. Of his early life few particulars are known. He applied himself to the study of the early French chroniclers, and proposed to publish extracts which would throw light on the first periods of the monarchy. During the civil wars he lost a large part of his books and manuscripts in a riot, and was compelled to leave Paris. He then settled at Marseilles. Attaching himself afterwards to Cardinal de Tournon, he accompanied him in 1554 to Italy, whence he was several times sent on embassies to the king, with reports on the siege of Siena. His services at length procured him the post of president of the chambre des monnaies, and thus enabled him to resume his literary studies. Having become embarrassed with debt, he found it necessary, at the age of seventy, to sell his office; but the king, amused with an epigram, gave him a pension, with the title of historiographer of France. Fauchet has the reputation of an impartial and scrupulously accurate writer; and in his works are to be found important facts not easily accessible elsewhere. He was, however, entirely uncritical, and his style is singularly inelegant. His principal works treat of Gaulish and French antiquities, of the dignities and magistrates of France, of the origin of the French language and poetry, of the liberties of the Gallican church, etc. A collected edition was published in 1610. Fauchet took part in a translation of the *Annals* of Tacitus, which appeared in 1582. He died at Paris about the close of 1601.

FAUCHET, CLAUDE (1744–1793) the Abbé Fauchet, a French constitutional bishop, and a noted actor in the Revolution, was born at Dornes, in the department of Nièvre, September 22, 1774. He devoted himself to the service of the church, passed through the usual course of studies, and was rapidly promoted. Before he was thirty years of age he made his mark as an orator in a panegyric of St. Louis, delivered before the French Academy. For some time he was engaged as tutor to the children of the marquis of Choiseul, a brother of the famous minister of

Louis XVI.; and he was afterwards nominated grand-vicar of the archbishop of Bourges, preacher to the king, and abbé of Montfort-Lacarre in Brittany. The influence of the new philosophy was clearly seen in his discourses, and the political tone of his sermon, *Discours sur les mœurs rurales*, at the festival of La Rosiere at Surènes, especially exposed him to censure. As he was proof against remonstrance, he was deprived of his office as preacher to the king. This occurred in 1788; and when in the following year the Revolution broke out, Abbé Fauchet was ready to fight with the foremost in the great cause. His speeches fired the primary assemblies and the sections of Paris, and on the memorable 14th of July he was one of those who led the people to the attack on the Bastille, displaying, it is said, not only courage under fire, but skill worthy of an accomplished officer. He was elected a member of the commune of Paris, figured in the clubs, blessed the tricolor flag for the National Guard, and by all means helped forward with a passionate zeal the revolutionary movement. He contributed to the reorganization of the church by his *Discours sur la religion nationale;* and in May, 1791, he was appointed constitutional bishop of Calvados. During the same period he had delivered three discourses on liberty, a discourse on the harmony of religion and liberty, the funeral oration of the Abbé de l'Épée, and an *Éloge civique* of Franklin. The last of these was spoken in the rotunda of the corn-market in the course of the festivities of the federation in July, 1790. In these pieces the swift progress of the Revolution was reflected in a growing intensity of sympathy and enthusiasm on the part of the orator; and hostility to the church carried him well nigh to a denial of the faith of which he was a minister. In the winter of 1790–91 Fauchet organized, in the precincts of the Palais Royal, his "Cercle Social," with regenerative intent, to be carried out chiefly by means of fluent oratory. He presided in the meetings under the self-assumed title of "Procureur général de la Vérité." Condorcet was one of his coadjutors, and "ten thousand persons of respectability" flocked to hear them,—a noisy and phantasmal affair, which came to a speedy end. In 1791 Fauchet was elected deputy to the legislative assembly, and afterwards to the convention. He wrote in favor of an agrarian law, voted against payment of priests who refused the oath to the constitution, and was one of the first to submit to the decree for suppression of ecclesiastical costume. The excesses of the Jacobins, however, alarmed him, and he began to incline towards the Girondists. On the trial of the king he spoke earnestly and courageously against the proposal to put him to death, and voted for the appeal to the people, imprisonment, and banishment. The execution of the king drove him still nearer to the party of the Girondists, and thus made him an object of the wrath of the Mountain. His name was one of those included in the proscription list, but he continued to act as secretary of the assembly till May 31, 1793, when the decree of accusation against the Girondists was passed. On the 18th July he was accused, not only as a Girondist, but also, and without ground, as an accomplice of Charlotte Corday, the murderer of Marat. He was sent to the Conciergerie, was condemned with the Girondist deputies by the revolutionary tribunal on October 30, and with them executed on the 31st.

FAUJAS DE SAINT-FOND, BARTHÉLEMI (1741–1819), French geologist and traveller, was born at Montélimart, May 17, 1741. He was educated at the Jesuits' College at Lyons; and, showing in his boyhood much poetic sensibility and a propensity to versifying, he received from some of his worldly-wise elders the earnest warning,—If you would succeed, don't make verses. He appears to have submitted to this counsel; for he went to Grenoble and applied himself to the study of law, and was admitted advocate to the parliament. He rose to be president of the seneschal's court (1765), a post which he honorably filled, but the duties of which became before long intolerably irksome, for his feeling for nature was not extinguished, and his favorite relaxation was found in visits to the Alps. His final bent, however, was not to the poetic but to the scientific interpretation of nature. In his frequent Alpine rambles he was amassing observations and facts, the full value of which could only be known at a later time. Geology was in its infancy, had scarcely even a name, when Faujas began his studies of the forms, structure, composition, and superposition of rocks, nor was it possible for him to divine how vast the science that was to arise upon the foundation of the facts of which he was so keen and so diligent an observer. In 1776 he put himself in communication with Buffon, who was not slow to perceive that the humble labors of Faujas would be of great service to him in his larger and more imaginative sphere of work. Invited by Buffon to Paris, he quitted the law, and was appointed by Louis XVI. assistant naturalist to the museum, to which office was added some years later (1785, 1788) that of royal commissioner for mines. In 1775 he had discovered in the Velay a rich mine of pozzuolana, which he opened, and which was largely worked by the Government. One of the most important of his works was the *Recherches sur les volcans éteints du Vivarais et du Velay*, which appeared in 1778. In this work, rich in facts and observations, he developed his theory of the origin of volcanoes. In his capacity of commissioner for mines Faujas travelled in almost all the countries of Europe, everywhere devoting his chief attention to the surface of the globe, and the nature and constituents of the rocks composing it. It was he who first called attention to the basaltic formation of the cave of Fingal (Staffa). He sustained heavy losses during the early years of the Revolution, but for these he was in 1797 indemnified by a grant made by the council of five hundred. Having been nominated in 1793 professor at the Jardin des Plantes, he held this post till he was nearly eighty years of age, retiring in 1818 to his estate in Dauphiné. Faujas took a warm interest in the balloon experiments of the brothers Montgolfier, and published a very complete *Description des expériences de la machine aërostatique de MM. Montgolfier*, etc. (1783, 1784). He contributed many scientific memoirs to the *Annales* and the *Mémoires* of the museum of natural history. Among his separate works, in addition to those already named, are—*Histoire naturelle de la province du Dauphiné* (1781, 1782); *Minéralogie des Volcans* (1784); *Voyage en Angleterre, en Ecosse, et aux Iles Hébrides* (1797); and *Essai de géologie* (1803–1809). Faujas died at his estate of Saint-Fond in Dauphiné, July 18, 1819.

FAUN. In Latin mythology, this name denoted a class of rural deities, who fostered the productive powers of the earth and of animals, and had their dwelling in woods and groves, where they sported with the nymphs. In the later traditions of the people, Faunus was said to have succeeded Picus and Saturnus as king of the Laurentes; but these names may, like many others in the mythology of Italy, be referred to processes or phenomena in the natural world, Saturnus or Seviternus being the god of the seed time and the harvest, and Picus the deity who cleaves the trees of the forest with the stroke of the lightning or the fury of the storm. There is much likeness between the characteristics of Faunus and those of the Greek Pan, and the two names may have a common origin, although the Latin Faunus has been regarded as an euphemistic name (from the root of the verb *faveo*) applied to deities whose anger was dreaded. As revealing the secrets of the future, whether by dreams or by strange sounds, the male Faunus and the female Fauna or Faula were known as fatuus and fatua, from the verb *fari*, to speak, which reappears in the Latin Fatum. In honor of these rural gods the festival of the Faunalia was celebrated yearly in December.

FAURIEL, CHARLES CLAUDE (1772–1844), a distinguished French historian, philologist, and critic, was born at St. Étienne, 21st October, 1772. His parents belonged to the artisan class, but their circumstances were such as to enable them to afford him a good education at Tournon and Lyons. Though from his earliest years preferring a life of study and retirement, Fauriel could not at first altogether escape the claims of the restless times in which he lived, and in 1793 he became sub-lieutenant in the fourth battalion of light infantry, then in garrison at Perpignan. He would appear to have resigned this appointment within a year, but it is certain in any case that he was for some time secretary to General Dugommier, and that he also served under Latour d'Auvergne. In 1794, however, he had returned to St. Étienne, where, but only for a short period, he filled a municipal office; and from 1795 to 1799 he devoted himself to strenuous study, more especially of the literature and history, both ancient and modern, of Greece and Italy. Having paid a visit to Paris in 1799, he was introduced to Fouché, minister of police, who immediately conceived for him a strong liking, and induced him to become his private secretary. The duties of this office

Fauriel discharged both to the satisfaction of Fouché and with such courtesy and kindness as to secure many lasting friendships; but he must have found it scarcely congenial; and as he continued to unite with the labor it entailed upon him the same continuous application to study as formerly, he found it necessary in 1801 to recruit his health by foreign travel. In resigning his office in the following year, he was therefore actuated doubtless as much by these considerations as by the ostensible excuse that he had scruples in serving longer under Napoleon, when the latter, in violation of strict republican principles, became consul for life.

Some articles which Fauriel in 1800 published in the *Decade* on a work of Madame de Staël were the means of ripening his slight acquaintance with that distinguished authoress into intimate friendship—a friendship which in its intellectual relations had considerable influence on her future career. Through her he was shortly afterwards introduced into the literary society of Auteuil. Neither in the literary history of his time nor in that particular circle can Fauriel be called the most prominent figure, but his position would not have been so unique in relation to either had it been more obtrusive. By nature strongly sympathetic, gifted also with a finely balanced judgment which was informed and cultivated to a high degree of perfection by an almost unexampled erudition, and so intensely interested in all that related to literature and history as to be almost forgetful of self and devoid of the love of fame, he soon became the confidant and almost the literary mentor of the most distinguished of his contemporaries, whom he benefited, not only by his contagious enthusiasm and suggestive criticism, but by placing at their disposal the results of his own laborious researches. Those who enjoyed his closest intimacy were the physiologist Cabanis and the Italian poet Manzoni, and perhaps after these, the historians Guizot and Thierry, the latter of whom in his preface to his *Études historiques* speaks of him as the friend and sure and faithful counsellor, whose judgment was his rule in doubt, and whose sympathy with his labors his greatest incentive to progress. During his connection with Auteuil the attention of Fauriel was naturally turned to philosophy, and from the letter which Cabanis addressed to him on final causes it would appear that he must be named the precursor of that school of philosophy in France which recognizes Cousin as its head—that he was the first to direct attention to the importance of studying philosophy in its historical relations, and to advocate what is known as eclecticism. His great merit indeed is in emphasizing the necessity of studying, not only the philosophy, but the general literature and civilization of modern times in their primitive sources; although it must be admitted that his preference for early and uncultured forms of literature has in it something of exaggeration. For some years he was engaged on a history of Stoicism, but perhaps more on account of his attention having been accidentally directed to the subject by others than from any special interest in philosophy, and at any rate the work was never completed, all the papers connected with it having accidentally perished in 1814. He also occupied himself at the same time with the study of Arabic, Sanskrit, and the old French dialects, but all with a special reference to his historical researches. The chief task he had set before him was an inquiry into the origin of modern civilization, the wide range of his preliminary studies being accounted for by the fact that they were of the nature of soundings taken with a view to discover with some approximation to certainty where the treasure he was in search of was concealed; and it was because he became convinced that the object of his quest was to be found in southern Gaul that his studies gradually came to have a bearing more or less direct on the elucidation of the early history of that country. His opinions on subjects which had an incidental relation to his chief purpose were occasionally contributed to periodicals; and as a kind of interlude to his severer studies he published in 1810 a translation of the *Parthenais oder die Alpenreise* of the Danish poet Baggesen, with a preface on the various kinds of poetry; in 1823 translations of two tragedies of his friend Manzoni, with a preface *Sur la théorie de l'art dramatique;* and in 1824 his translation of the popular songs of modern Greece, with a *Discours preliminaire* on popular poetry, in which he claims for that species of literature a preference in some respects over the most cultivated and artistic productions on account of its freshness and its intimate connection with nature and reality, and also as the best key to the comprehension of a nation's history, inasmuch as it is the spontaneous expression and outflow of its peculiar genius and of its deepest experiences.

After the revolution of 1830, the Government was persuaded by his friends to establish expressly for Fauriel a chair of foreign literature. In 1836 he was elected a member of the Academy of Inscriptions and Belles Lettres, and in the same year he published in four volumes *L'Histoire de la Gaule méridionale sous la domination des conquérants Germains*—the second portion of a work which, when completed, was to have consisted of three parts, the first on southern Gaul under the Roman dominion, and the third and most important embracing the period from the dismemberment of the empire of Charlemagne to the end of the 13th century, and including the brilliant though premature spring-time of early literature and culture which for a short period relieved the sterile winter that had so long overshadowed the intellect of Europe. In 1837 Fauriel published, along with an introduction, a translation of the Provençal poem on the war of the Albigenses, and in 1839 he became a member of the commission of the Histoire littéraire de la France, to which work he contributed a number of articles on the writers of the 13th century. He died 15th July, 1844. After his death appeared, in 1846, *Histoire de la littérature provençale,* which formed his course of professorial lectures for 1831–32, and may be regarded as a portion of the third part of the great work which he had sketched out on the history of southern Gaul. In these lectures he sought to prove that from the embers of the civilization of Greece and Rome, which, by a peculiar combination of circumstances, had been transferred not wholly quenched to the foreign soil of Provence, was lighted the spark which originated the greater part of the romances of chivalry (that is, not only those of the cycle of Charlemagne, but of the cycle of the Round Table), and thus kindled the civilization of modern Europe. Various opinions have been formed as to the amount of truth in this theory, and it must at least be admitted that Fauriel has been somewhat hampered and biased in his inquiry by preconceived conclusions; but in any case he must be allowed the merit of having first fully revealed the importance of the epoch of which he treats, and having supplied the greater part of the materials for the solution of the problems which it presents for discussion. Indeed, the distinguishing quality of his writings is their suggestiveness, and their value is therefore scarcely lessened even when their conclusions are disputed. The statement of Renan, made in 1855, that he is the man of our times who has put in circulation the greatest number of new ideas, can scarcely, however, be accepted, even when we remember his indirect influence on the contemporary writers of France; but none was more than he *en rapport* with the spirit of the 19th century, or has done a more important work in reference to those problems which are strictly literary or historical. The professorial lectures of Fauriel for 1833–34 were published in 1854, under the title of *Dante et les origines de la langue et de la littérature italiennes;* and among his miscellaneous writings the most important are his examination of the *Système de M. Raynouard sur l'origine des langues romanes,* contributed to the *Bibliothèque de l'École des Chartes,* and his lives of Dante and Lope de Vega in the *Revue des Deux Mondes* for October, 1834, and September, 1839, respectively.

The best and fullest account of Fauriel is that by Sainte-Beuve in his *Portraits Contemporains,* vol. iv. See also the review of Fauriel's work on Provençal literature by H. Fortoul in the *Revue des Deux Mondes* for May, 1846, and the short notice of his work on Dante by Renan in the *Revue des Deux Mondes* for December, 1855.

FAUST, or FUST, printer. See FUST.

FAUSTINA, ANNIA, wife of Marcus Aurelius, was the daughter of Antoninus Pius and the empress Annia Galeria Faustina Augusta. Her husband, whose original name was Marcus Annius Verus, was the son of her maternal uncle Annius Verus; and both, through their grandfather Annius Verus, consul for the third time in 126 A.D., traced their descent from Numa Pompilius. Besides Commodus, Faustina had six children whose names are known,—viz., Annius Verus, Annia Lucilla Augusta, Vibia Aurelia, Sabina, Domitia Faustina, Fadilla; but she is supposed to have had eleven. Faustina was either one of the most profligate or most maligned of women. Wieland appears to be almost her only apologist in modern times; and in her own day (if we accept the testimony of contemporary historians) the only man who believed in her virtue and goodness was her great and wise husband,—whose testimony, it has been urged, ought to be deemed sufficient to outweigh the gossip of Dion Cassius. On the other hand, it might be contended that the emperor was just as likely to misjudge the character of his wife as of his son Commodus, the buffoon of the imperial purple. The empress's impunity amid her alleged vices, and the emperor's patronage of her supposed paramours, have even been deemed unfavorable to the reputation for judgment and sincerity of one of the noblest men of antiquity. Faustina died in 175, at Halala, near Mount Taurus, in Cappadocia, whither she had accompanied Marcus in his expedition against the rebel Avidius Cassius, commander-in-chief of the imperial armies in Asia. Aurelius, in memory of his wife, raised the obscure village to the rank of a city, with the name of Faustinopolis. In her honor, too, he founded charitable schools for orphan girls—which were similar to those that Antoninus had established in memory of his own wife, the elder Faustina. The title *Mater Castrorum* first appeared on the coins of the younger Faustina. *Pudicitia* is another legend commemorative of this supposed incarnation of immodesty. Marcus Aurelius placed his wife's statue in the temple of Venus, and Faustina was numbered among the guardian deities of Rome.

FAUSTUS. Although probably the name of an actual historical personage, Faustus or Faust is principally interesting as an ideal figure of a twofold and in some respects antithetical type,—on the one hand the deliberate choice of evil, on the other an unsatisfied aspiration towards the highest good. The development of the latter conception from the former—of Goethe's Faust from the mediæval Faustus—is an interesting study in itself, and affords a curious example of the accretions and modifications incidental to popular myths. The Faustus of tradition arose from the fusion of two more primitive conceptions,—that of a compact with the evil one, of which the Theophilus of ecclesiastical legend supplies the typical example, and that of the subjugation of the infernal powers by intellectual pre-eminence, as in the cases of Virgil, Pope Sylvester, and Michael Scott. Early in the sixteenth century the two currents of tradition united in the person of an adventurer calling himself Faustus the Younger, from which it may be inferred that the name had already become typical. The existence of an elder Faustus cannot, however, be proved; nor can he, as sometimes suggested, be identified with Gutenberg's coadjutor, the printer Fust. A conjuring book bearing his name (*Dr. Faust's Dreifacher Höllenzwang*) exists in several MSS. dated early in the sixteenth century, and has been published in the magical collections of Scheible and Horst. It nevertheless appears from the style to be at least a century later. The younger Faust's own existence has been disputed, but apparently on no good grounds. He is mentioned as a contemporary by Trithemius (1507), Mutianus Rufus (1513), Begardi (1539), and Gast (1548). Trithemius denounces him as a charlatan, who purposely shunned him for fear of exposure. Rufus and Gast claim to have been actually in his company. The former entertains the same opinion of him as Trithemius; the latter considers that a learned dog and horse which accompanied him were probably devils. The same judicious author vouches for his having been carried away by the demon in or about the year 1525. This catastrophe is also mentioned in an inscription on a picture still extant in Auerbach's cellar at Leipsic, bearing that date, and depicting the feats familiar to Goethe's readers. Further particulars are given by Wier in his well known work *De præstigiis dæmonum*, and in Manlius's *Locorum communium collectanea* (1562), in a passage often erroneously attributed to Melanchthon, whose conversation Manlius is not reporting on this occasion. According to him, Faustus was born at Knittlingen in Würtemberg (the popular legend says Rohda in Saxony, and other places are also mentioned), and educated at the university of Cracow. However unworthy of such a distinction, he had evidently by this time become a popular hero, around whom the floating accumulations of legend respecting such national wizards as the Bohemian Zyto, the English Friars Bacon and Rush, and the Polish Twardowski were gradually tending to group themselves. These ultimately took shape in the standard version of Faustus's life, published at Frankfort by Johannes Spiess in 1587. This remarkable book, the work of an anonymous scholar acquainted with Latin, first mentions Mephistopheles as the name of Faustus's familiar spirit, introduces new elements suggested by the compiler's animosity to Rome, and gives especial prominence to the traditions which represent Faustus in connection with classical mythology. The effect is to exalt his importance as a type by exhibiting him as in some sort a representative of free thought and free learning, thus paving the way for Goethe's more profound interpretation of his alleged compact with the fiend. The more obvious tragic aspects of the situation were magnificently brought out by Marlowe, whose tragedy of *Faustus*, founded on an English translation of the German narrative, is thought to have appeared as early as 1589. Marlowe's play contains some of the finest dramatic poetry in our language, and he dwells with especial delight on Faustus's evocation of Helen, which by education and sympathy he was peculiarly qualified to apprehend. It was inevitable, however, that he should be principally studious of dramatic effect; and the perception of the full significance of this episode, as well as of the story generally, was reserved for a more reflective age. A more homely moral was drawn by Faustus's next biographer, Johann Wiedemann, who (1599) rewrote the narrative from an edifying point of view, interspersing copious historical parallels and theological disquisitions,—which latter, indeed, are not wanting in the earlier version,—and omitting what he deemed unsuitable for pious ears. His pedantic labors, subsequently revised in the same spirit by Pfitzer (1664), unfortunately led to the almost total disappearance of the older narrative, except in the abridged form of a chap book, in which it has survived nearly to our own times, and has even been reprinted in America. Another development of the myth was now at hand—the dramatic. It formed the theme of *Justi Placidii infelix prudentia*, a play in Latin verse published at Leipsic in 1598. By 1618, as appears from Ayrer's *Opus Theatricum*, a play on the subject was a stock piece on the boards of the German puppet-theatre. Heine thinks that it was introduced by the English itinerant players who traversed Germany at the time,—a supposition confirmed by Lessing's previous indication of an English element in the text. These marionette pieces long maintained themselves as a popular entertainment. Zedler mentions them as still frequently performed in 1735; Heine saw the story of Faustus thus represented as late as 1826. It was not committed to writing, and was partly extemporized for the occasion. Restorations have nevertheless been given by Scheible (1847), Hamm (1850), and Engel (1872). Such representations undoubtedly served to keep the legend alive until it met with critics and poets able to discern its significance in the persons of Lessing and Goethe. The original draft of the latter's *Faust*, as pointed out by Heine, is almost entirely based upon the puppet representation. Lessing's interest in Faust is believed to have been awakened by a performance of the old play at Berlin in 1753. He took up the subject shortly afterwards, and, according to his own statement, at different periods of his life sketched out the ground plan of two versions,—the first on the lines of the original legend, the second without any supernatural element. Both are said, on his own authority, to have been nearly completed in December, 1775, but were probably lost in the following year, along with a trunk containing other MSS. An anonymous *Faust* appeared in 1775 at Munich, and has recently been republished as Lessing's, which it certainly is not. The conception of Goethe's *Faust* was formed as early as 1770, and, according to the contemporary testimony of Merck, the composition had made great progress as early as 1775. The first part, notwithstanding, was not completed until 1807, nor the second until 1831. The analysis of this wonderful work will fall more appropriately under the heading GOETHE (*q. v.*). It need only be remarked here that, while Goethe has finally achieved the transformation of Faustus from a vulgar conjurer into a personification of humanity in one of its most interesting phases, the result, in the first part, is still inadequate to the power of the machinery and the dignity of the situation. As Charles Lamb tersely expressed it, "What has Margaret to do with Faust?" The much abused and underrated second part may be regarded as an endeavor to remedy this defect, which might have fully succeeded but for the taste for allegory which had become a mania with Goethe in his later years. The Helena episode is nevertheless a masterpiece, and the fifth act presents the quintessence of Goethe's wisdom with the authority of a last testament:—

> "Ja, diesem Sinne bin ich ganz ergeben:
> Das ist der Weisheit letzter Schluss!"

Among later attempts at a literary treatment of the Faust legend may be mentioned Klinger's romance, translated into English by Borrow, and chiefly remarkable for the introduction of the Borgia family; Klingemann's unwittingly burlesque tragedy, "the hero of which is not the old Faust driven desperate by the uncertainty of human knowledge, but plain John Faust the printer driven desperate by an ambitious temper and a total deficiency of cash" (Carlyle); Heine's ingenious and highly dramatic ballet (*Der Doktor Faust, ein Tanzpoem*); and Lenau's poem, partly epic and partly dramatic, not deficient in isolated beauties, but a mere repetition of Goethe in all essential respects. Goethe's example, as well as the generally subjective character of modern poetry, has led to the creation of a number of ideal figures impersonating some particular thought or principle, and betraying more or less affinity to their original. Such are the Manfred of Byron, the Paracelsus of Browning, the Balder of Dobell, the Spiridion of George Sand, the Konrad Wallenrod of Mickiewicz, last and not least remarkable the Brand of the Norwegian poet Ibsen. The affinity between the typical figures of Faustus and Tannhäuser is very powerfully indicated in the last poem of the lyrical collection entitled *Der neue Tannhäuser*, by Eduard Grisebach (1871).

The best works on the history of the Faustus legend are—Eistelhuber, *Faust dans l'histoire et dans la légende* (Paris, 1863); Düntzer, *Die Sage von Dr. Johann Faustus* (Stuttgart, 1846); the article by W. Sommer in Ersch and Grüber's *Encyclopædia*, and that in Meyer's *Conversations Lexicon*. For its bibliography see Peter, *Die Literatur der Faustsage* (3d edit. Leipsic, 1857), and the "Bibliotheca Faustiana" in the first part of Engel's *Deutsche Puppenkomödien* (1872). The earliest extant edition of the English version of the German legend, from which it departs in several respects, bears date 1592, but the work had been published previously. It is reprinted in the third volume of Thoms's *Early English Prose Romances* (1827). (R. G.)

FAVARA, a town of Sicily, in the province of Girgenti, is situated 5 miles E.S.E. of Girgenti in a mountainous district near the Hypas, a tributary of the Acragas. It possesses a beautiful old chateau of the Charamonti family, built in the 14th century. In the neighborhood of Favara there are large sulphur mines, marble quarries, and deposits of bitumen; and it has also a considerable trade in grain and fruits. The population in 1871 was 15,197.

FAVART, Charles Simon (1710–1792), French dramatist, was born at Paris, November 13, 1710. He was the son of a noted pastry-cook, a man of some parts who in his leisure hours amused himself with making verses. The son was educated at the college of Louis-le-Grand, and after his father's death carried on the business for a time for the sake of his mother. His first success in literature was a poem entitled *La France délivrée par la Pucelle d'Orléans*, which obtained the prize of the Académie des Jeux Floraux. After the production of his first vaudeville, *Les Deux Jumelles*, circumstances enabled him to relinquish his business and devote himself entirely to the drama. He provided many pieces anonymously for the lesser theatres, and first put his name to *La Chercheuse d'Esprit*, which was produced in 1741. Among his most successful works were *Annette et Lublin*, *Le Coq du Village* (1743), *Ninette à la Cour* (1755), *Les Trois Sultanes* (1761), and *L'Anglais á Bordeaux* (1763). Favart became director of the Opéra Comique; and in 1745 he married Mademoiselle Duronceray, a beautiful young singer and actress who had made a successful début the year before. By their united talents and labors the Opéra Comique rose to such a height of success that the jealousy of rival theatres was aroused, and through their influence the house was suppressed the same year. Favart thus left without resources accepted the proposal of Marshal Saxe, and undertook the direction of a troop of comedians which was to accompany his army into Flanders. It was part of his duty to compose from time to time impromptu verses on the events of the campaign, amusing and stimulating the spirits of the men. So popular were Favart and his troop that "the enemy" became desirous of sharing his services, and permission was given to gratify them, battles and comedies thus curiously alternating with each other. But in the midst of his success a heavy blow fell upon him. The marshal had looked with evil eyes upon Favart's young wife, and attempted to seduce her. To escape him the wife fled to Paris, and the wrath of the foiled adulterer fell upon the husband. A *lettre de cachet* was issued against him, and he only saved himself by flight and concealment in a cave. Madame Favart meanwhile had been distinguishing herself at the Comédie Italien; but as she still rejected the brutal advances of the marshal, she was suddenly arrested and confined in a provincial convent, where she was treated as a prisoner of state. After an imprisonment of more than a year her fortitude gave way, and, yielding to the will of her pursuer, she was at length liberated. After the marshal's death in 1750, Favart returned to Paris, and resumed his pursuits as a dramatist. It was at this time that the Abbé de Voisenon became intimately associated with him and took part in his labors, though to what extent is uncertain. Madame Favart, after a long and painful illness, died at Paris, April 22, 1772. She is remembered as a bold reformer of stage costumes, breaking with the custom of dressing all the *dramatis personæ* in court or showy style, and introducing the use of costumes appropriate to the various characters. She had remarkable powers of mimicry, especially of the speech and accent of foreigners. She assisted her husband in some of his best productions. He felt her loss deeply, survived her twenty years, becoming nearly blind in his last days, and died at Paris, May 12, 1792. His works have been several times republished. In 1809 appeared his *Mémoires et Correspondance littéraire, dramatique, et anecdotique*, which furnish valuable information on the state of the literary and theatrical worlds in the 18th century. This work, in 3 vols. 8vo, was edited by his grandson A. P. C. Favart and H. F. Dumolard.

FAVERSHAM, or Feversham, a municipal borough and market-town of England, county of Kent, is situated 10 miles W.N.W. of Canterbury, and 47 E.S.E. of London by rail. The town consists of four principal streets, forming an irregular cross, in the centre of which are the town-hall and market-place. The parish church is a spacious cruciform structure, surmounted by a tower and spire; both its exterior and its interior have lately undergone restorations. Faversham has a free grammar school, a national school, a theatre, and assembly-rooms. Faversham Creek, which communicates with East Swale, is navigable up to the town for vessels of 150 tons. The shipping trade is pretty extensive, chiefly in coal, timber, and agricultural produce. The oyster fisheries are the principal industry, but brewing, brickmaking, and the manufacture of Roman cement are carried on, and there are several large powder mills in the vicinity of the town.

Faversham is very ancient, and on account of its situation directly opposite the south-east extremity of the Isle of Sheppey early rose into consideration. In 812 it was styled "the king's little town of Fefresham," and in 930 it was the meeting place of a *witan* or national council. King Stephen and Queen Maud founded here, in 1147, a Cluniac abbey, and both they and their son, Eustace count of Boulogne, were buried within its walls. It was to Faversham that the boatmen conveyed James II. after preventing his escape in a small vessel lying at Shellness. The population in 1871 was 7198.

FAVORINUS, *Φαβωρῖνος*, a celebrated sophist, flourished during the reign of Hadrian. A Gaul by birth, he was a native of Arles, but at an early age began his life-long travels through Greece, Italy, and the East. He may have acquired some knowledge of Latin and Greek even before he left Gaul, for Arles was within a short distance of the Phocian colony of Marseilles—that "Athens of the West" which Varro calls "trilinguis," and which, according to Strabo, had taught the Gauls to become Philhellenes. His extensive knowledge, combined with great oratorical powers, raised him to eminence both in Athens and Rome. With Plutarch, who dedicated to him his treatise *περὶ τοῦ πρώτου ψυχροῦ*, with Herodes Atticus, to whom he bequeathed his library at Rome, with Demetrius of Alexandria, Cornelius Fronto, and Aulus Gellius, with Hadrian himself, he lived on intimate terms. His good humor appears to have been as inexhaustible as his wit, though in his later years he condescended to violent abuse of his rival Polemon, who divided with him the suffrages of Asia, the Smyrniote faction pronouncing Polemon to be the greater rhetorican of the two, while that of Ephesus declared for Favorinus. It was Favorinus who, on being silenced by Hadrian in an argument in which the sophist might easily have refuted his adversary, made the subsequent explanation to his friend that it was foolish to criticise the logic of the master of thirty legions. It was one of his sarcastic boasts that though he had offended Hadrian he still continued to live. When the servile Athenians, feigning to share the emperor's displeasure with the sophist, pulled down a statue which they had erected to the latter, Favorinus remarked that if Socrates also had only had a statue at Athens, he might have been spared the hemlock. Of the very numerous works of Favorinus, we possess only a few fragments preserved by Aulus Gellius, Diogenes Laertius, Philostratus, and Suidas, the second of whom borrows from his Παντοδαπὴ Ἱστορία. His Πυῤῥώνειοι Τρόποι, in ten books, mentioned by Philostratus in his *Lives of the Sophists*, i. 8, § 4, appears to have been his chief work.

The most modern sources of information regarding the life and work of Favorinus are *Fragmenta Philosophorum Græcorum*, collected and annotated by F. W. A. Mullach, Paris, 1857 and 1860. See also J. F. Gregor's *Commentatio de Favorino*, 1755, and Forsmann's *Dissertatio de Favorino*, 1789.

FAWKES, Francis (1721–1777), a poet and translator, was a native of Yorkshire, and was born in the year 1721. After studying at Jesus College, Cambridge, where he graduated M.A., he entered into holy orders, and was successively curate of Bramham, curate of Croydon, vicar of Orpington, and rector of Hayes, and finally was made one of the chaplains to the princess of Wales. He published *Bramham Park, a Poem*, in 1745; a volume of poems and translations in 1761; and *Partridge Shooting, a Poem*, in 1767. His translations of the minor Greek poets—Anacreon, Sappho, Bion and Moschus, Musæus, Theocritus, and Apollonius—acquired for him considerable fame, but it may be safely predicted that when they are forgotten Fawkes will be remembered for his fine song, *Dear Tom, this brown jug, that now foams with mild ale.* He also edited a Family Bible with notes. He died on the 26th August, 1777.

FAWKES, Guy (1570–1606), the most notorious of the Gunpowder Plot conspirators, was born at York, of a gentle family, in the year 1570. His grandfather and father were notaries and proctors of the ecclesiastical courts of York, the former being registrar of the exchequer court of the province, the latter an advocate of the consistory court of the cathedral. It is believed that the family was connected with the ancient house of the Fawkeses of Farnley in Yorkshire, but the evidence of such connection does not amount to proof. Guy was educated at the free school at the "Horsefayre," just outside the city of York, and had for schoolfellows Thomas Morton, afterwards bishop of Durham, and Thomas, grandson of Sir John Cheke. The school was under the superintendence of the dean and chapter, and this, and the fact of his immediate ancestors being employed in the ecclesiastical courts, would have led us to conclude that Fawkes was brought up in conformity to the established church. But we have more direct evidence of this, for the names, both of his parents and of his grandmother, occur several times in the list of communicants of the parish of St. Michael-le-Belfrey in which they lived. Perhaps the most determinant event in Fawkes's life happened when he was quite young. His father died when he was about eight years old, and before he came of age his mother married again. Her second husband was one Dionis Baynbridge, settled at Scotton near Knaresborough. Baynbridge was connected with several Roman Catholic families. Several families, steadfast in the old faith, were settled near Scotton,—among them, that of Sir William Ingilby of Ripley, whose sister was mother of the Robert, Thomas, and John Winter with whom, later in life, Fawkes was brought into such close contact. For some years he lived under the roof of his stepfather, who, we have every reason to believe, was a Roman Catholic. Guy was the only son and, as there was no will, the sole heir of his father. He said in confession, "My father left me but small living, which I spent." There is, in fact, evidence that when he came of age he sold the little land left him, and soon after, as it appears, enlisted as a soldier of fortune in the army of Flanders, and is said to have been present at the taking of Calais by the Archduke Albert in 1598. He was sent by Sir William Stanley and the Jesuits in Flanders to join Christopher Wright in a mission to the king of Spain immediately after the death of Elizabeth. Early in 1604 he was again in Flanders and with Stanley.

The Catholics in England had hoped much from the accession of James I. To facilitate his passage to the throne, he had given great cause for such hopes, promising that the fines against recusants should not be exacted, and bestowing honors upon several Roman Catholic gentlemen. Therefore, when, after James was securely seated on the throne, the severe laws of Elizabeth against priests and recusants were again put into execution, many Roman Catholic gentlemen experienced feelings of deep resentment. Robert Catesby, a man steeped in plots, conspiracies, and secret embassies, but a gentleman of great personal power and fascination, conceived a plan for the remedy of all this His parents had suffered much for their religion, and h himself had been an incessant plotter among the discontented Catholics of the later years of Elizabeth's reign, and for joining in Essex's rebellion had been heavily fined. But there is no reason to believe that he, or indeed any of the conspirators, were actuated by selfish motives or feelings of revenge in assenting to that scheme for the carrying out of which they dared and suffered so much. Catesby's own words probably express best the way in which they regarded the matter. "The nature of the disease," he said, "requires so sharp a remedy." It should also be remembered that the plot was conceived and entered upon before the more severe execution of the laws against recusants. Catesby's plan was to blow up king, lords, and commons in the Parliament House with gunpowder. Early in 1604 he wrote to his cousin Thomas Winter desiring him to come to London. Winter, after some hesitation, having consented, found Catesby at Lambeth with John Wright. All three were old plotters and companions in plots and conspiracies. Catesby now broached his new scheme to Winter, who at first wondered at the strangeness of the conception and doubted of success, but finally gave his consent to it or to anything that Catesby should decide to enter upon. Wishing, however, to leave no quiet way untried to obtain their end, it was decided that Winter should go over to Flanders, to meet Velasco, the constable of Castile, who was coming to England to negotiate the peace with Spain. Winter was to inform the constable of the state of the Catholics in England, and to entreat him to solicit the king that the penal laws against them might be recalled. Catesby named Fawkes as a likely man in case this quiet way failed. Winter saw the constable at Bergen, and giving up the hope that much would be done by his means, sought out Fawkes, whom he found with Stanley at Ostend. Representing to him that something was in hand to be done in England, they passed together from Gravelines to Greenwich April 22, 1604, and at once went to Catesby. At a meeting soon after they were joined by Thomas Percy, another zealous Romanist, a relative of the earl of Northumberland, and one of the king's pensioners. The plot was propounded and approved of; all took a solemn oath of secrecy and perseverance, and afterwards received the sacrament from Gerard, a Jesuit, who was in another room. In May a house adjoining the Parliament House was hired in Percy's name, from the cellars of which the conspirators proposed to work a mine. Having, however, with great labor worked about half-way through the nine feet of stone which composed the wall, they discovered that a vault, immediately under the House of Lords, was to let, and as this exactly suited their purpose, it was at once engaged by Fawkes, who, being little known in England, passed as Percy's servant, and took the name of Johnson. Barrels of gunpowder which had been stored in a house at Lambeth were brought over in the night, large stones and bars of iron were placed upon them, and the whole covered with billets of wood, so that no suspicion might be excited in case it was found necessary to admit a stranger. All was prepared about May, 1605. The plan of the plot was that after the blow had been given, as most probably the Prince of Wales would attend and perish with the king, the duke (Charles) was to be seized and carried into the country if possible; or otherwise possession was to be obtained of the person of the Princess Elizabeth, who was then at Combe Abbey in Warwickshire, and a rising was to be prepared among the Catholics of the midland counties. Fawkes was to fire the train, and then to get over as quickly as possible into Flanders in a ship prepared for his passage. After being several times prorogued, parliament was to meet on the 5th of November.

During the progress of the preparations many other gentlemen, Robert Winter, Christopher Wright, Keyes, Rookwood, Sir Everard Digby, and Francis Tresham, had been sworn in by Catesby to assist with labor or money. In the interval between the completion of the preparations and the opening of parliament, Fawkes was sent into Flanders to acquaint Stanley and Owen the Jesuit with the plot, and to secure their co-operation after the event of the explosion. A great cause of disagreement among the conspirators was the fact that the Catholic lords and members of parliament would be destroyed in a common catastrophe with those whom the plot was specially intended to strike. That the Catholics should somehow be warned there was general agreement, but not as to the method in which the warning should be given. This disagreement no doubt caused the failure of the whole transaction. Ten days before the opening of Parliament, Lord Monteagle, a Catholic and a friend of several of the conspirators, received an anonymous letter giving him a warning, couched in ambiguous terms, not to attend the opening, for "they shall receyve a terrible blowe this parleament." It is not known who wrote the letter. Tresham was, and is, generally suspected; but when Catesby accused him of it, he vehemently and with oaths denied all knowledge of the matter. Something in the character of the letter and of the attendant circumstances seems to render it probable that the whole thing was prepared beforehand to quash the plot, but in such a manner that the Government should not be fully alive to the danger until the conspirators had had time to escape. It has also been suggested that the whole plot itself was got up by Cecil, and was nothing but a state trick. However, Monteagle at once took this letter to Salisbury, who communicated it to the king, directly his Majesty returned from Royston, where he had been hunting, and it seems to have been at once decided that every precaution should be taken. Winter received warning that all was discovered. Tresham also warned Catesby and the others that all was known, and passionately desired them to make good their escape to foreign lands. They, however, determined to await further events, and Fawkes especially stuck to his post in the vault with that coolness of courage which seems to have been one of his chief characteristics.

The Lord Chamberlain on the 4th November, going over the Parliament House to see that all was prepared for the morrow, visited the vault, and there saw this "very tall and desperate fellow," who, together with the large quantity of fuel, exciting suspicions which he communicated to the king, it was decided that a more strict search should be made. Sir Thomas Knevet, a Westminster magistrate, was ordered to direct this search, and going down to the house suddenly, just before midnight, he came upon Fawkes just stepping out of the door. The 36 barrels of powder were discovered; Fawkes was seized, bound with his own garters, and searched. Upon him were found a watch, a tinder box, and some touchwood. He at once avowed his purpose, and said that if he had been within the house when taken he would have blown up house, takers, himself, and all. He was taken to Whitehall and examined before the king. Answering all questions with careless sarcastic indifference, he would say nothing to implicate his confederates. The other conspirators fled into the country to Dunchurch, where a meeting of the Catholic gentry had been convened under pretence of a hunting party. In the hue and cry which followed, all were either killed or taken. Fawkes and the others were repeatedly examined, and torture was, no doubt, in his case used to break the wonderful will and nerve of the man. On 27th January, 1606, the trial took place. All were condemned to be drawn, hanged, and quartered. On Thursday the 30th, Digby, R. Winter, Grant, and Bates (Catesby's servant) suffered in St. Paul's churchyard; the next day, T. Winter, Rookwood, Keyes, and Fawkes, at Westminster. So all yet alive who, from belief in the cause or from love of Catesby, had joined his outrageous plot ascended the scaffold, Fawkes last; "his body being weak with torture and sickness, he was scarce able to go up the ladder." He "made no long speech, but after a sort seeming sorry for his offence, asked a kind of forgiveness of the king and the state for his bloody intent," and so died.

Jesuit evidence describes Fawkes as a man "of great piety, of exemplary temperance, of mild and cheerful demeanor, an enemy of broils and disputes, a faithful friend," and asserts that his society was sought by all the most distinguished in the archduke's camp for nobility and virtue. There seems to be no doubt that he had qualities which under a different rule would have carried him to honor instead of to ignominy. There is something in the whole character of his actions and undertakings in this plot which seems to imply absolute self-renunciation for the cause believed to be just. But nothing could possibly have been more disastrous to the interest of the Catholics of England. The stringency of the laws against recusants was greatly increased, and their observance more severely exacted. The 5th November was ordered to be kept as a day of thanksgiving for ever, by an Act which was not repealed for over two centuries. The festivities which were long common on what is called Guy Fawkes's day are now perhaps dying out. The custom was to dress up an absurd figure in rags with a tall cap and a lantern, to parade with this through the streets singing rhymes, and finally at night to burn the effigy. This holocaust was in some places an important annual ceremony, presided over by the local officials.

The question as to the part taken by the Jesuits in the Gunpowder Plot has been a much debated one. There seems to be no doubt that Garnet, the superior of the order in England, had a guilty knowledge of the plot, if he did not even actively encourage it. He was tried and condemned March 28 and executed May 3, 1606.

Many valuable letters and memorials connected with this plot are preserved in the Public Record Office. The anonymous letter to Lord Monteagle and the reports of Fawkes's various examinations are there, as well as the reports of the examinations of Winter and other conspirators, supposed conspirators, suspected persons, and persons in any way connected with them. These were some years ago collected and bound in a volume called the *Gunpowder Plot Book*. They are not, however, separately calendared in the published series of calendars, but are noticed chronologically with the other papers. Winwood's *Memorials* contain valuable letters from Cecil and others to Sir C. Cornwallis about the plot, from the Cotton Library. See *Fawkeses of York in the Sixteenth Century*, and Jardine's *Narrative of the Gunpowder Plot*.

FAXARDO. See SAAVEDRA.

FAY, ANDRÁS (1786–1864), Hungarian poet and author, born 30th May, 1786, at Kohány, in the county of Zemplin, was educated for the legal profession at the Protestant college of Sárospatak. Being, however, subsequently obliged to abandon the law as a vocation on account of ill-health, he devoted himself to literary pursuits, and became one of the best writers of Hungarian narrative prose. His *Mesék* (*Fables*), the first edition of which appeared at Vienna in 1820, evinced his powers of satire and invention, and won him the well-merited applause of his countrymen. These fables, which, on account of their originality and simplicity, have caused Fáy to be regarded as the Hungarian Æsop, were translated into German by Petz, Raab, 1825, and partly into English by E. D. Butler, *Hungarian Poems and Fables*, London, 1877. Fáy wrote also numerous poems, the chief of which are to be found in the collections *Bokréta* (*Nosegay*), Pesth, 1807, and *Fris Bokréta* (*Fresh Nosegay*), Pesth, 1818. He also composed several plays and romances and numerous tales, busying himself through the whole of his career with every kind of literary work. In the year 1835 Fáy was elected representative for the county of Pesth, in the Hungarian diet, where he became for a time the leader of the opposition party; and, though afterwards eclipsed by Kossuth, he still continued to distinguish himself both by his liberal sentiments and by his unremitting efforts for the material internal progress of the nation. It is to him that the Pesth Savings Bank owes its origin, and he was one of the chief founders of the Hungarian National Theatre. He died on the 26th July, 1864. His earlier works were published in a collective form at Pesth, 1843–44, 8 vols. The most noteworthy of his later works is a humorous novel entitled *Jávor orvos és Bakator Ambrus szolgáia* (*Jávor the Doctor and his servant Ambrose Bakator*), Pesth, 1855, 2 vols.

FAYAL. See AZORES, vol. iii. p. 149.

FAYETTEVILLE, a town of the United States, capital of Cumberland co., North Carolina, is situated on Cape Fear River, 100 miles N.W. of Wilmington. It has cotton manufactures, and, on account of the large pine forests in its neighborhood, a considerable trade in timber, tar, and turpentine. It was settled in 1762, received its present name in 1784, was partly destroyed by fire in 1831, and was taken by the Union army in March, 1865. Population in 1870, 4660, of whom 2318 were colored.

FAYOUM, or Feiyoom. See Egypt, vol. vii. p. 671.

FEA, Carlo (1753–1834), an Italian archæologist, was born at Pigna in Piedmont, 2d February, 1753. At an early age he went to Rome, where he prosecuted his studies with a view to the legal profession, under the superintendence of his uncle, who was a distinguished ecclesiastic. He received the degree of doctor of laws from the university of La Sapienza, and for some time practised as an advocate; but archæology gradually came to occupy his chief attention, and with the view of obtaining better opportunities for his antiquarian researches he in 1798 took orders. As a member of the Archæological Society of Rome, Fea gave considerable aid to the antiquarian researches carried on under its auspices. He was also librarian to Prince Chigi. He died at Rome 18th March, 1834.

Fea revised, with the addition of notes, an Italian translation of Winckelmann's *Geschichte der Kunst*, and also added notes to some of Bianconi's works. Among his own works the principal are—*Miscellanea filologica, critica, e antiquaria; L'integretà del Panteon rivendicata a M. Agrippa; Frammenti di fasti consolari; Iscrizioni di monumenti pubblici;* and *Descrizione di Roma.*

FEARNE, Charles (1749–1794), an eminent writer on law, son of Charles Fearne, judge-advocate of the Admiralty, was born in London in 1749, and was educated at Westminster School. He adopted the legal profession, but, though well fitted by his talents to succeed as a barrister, he neglected his business and devoted most of his attention and his patrimony to the prosecution of scientific experiments, with the vain hope of achieving discoveries which would reward him for his pains and expense. He died in 1794, leaving his widow and family in necessitous circumstances. His *Essay on the Learning of Contingent Remainders and Executory Devices*, the work which has made his reputation as a legal authority, was called forth by a decision of Lord Mansfield in the case of Perrin *v.* Blake, and had the effect of reversing that decision. The 10th edition of this essay (1844) contains the notes added by Charles Butler to the 6th edition, with additions by Charles W. Smith. A volume entitled *Fearne's Posthumous Works* was published by subscription in 1797 for the benefit of his widow.

FEASTS. See Festivals.

FEATHERS. The scientific definition of the various parts of a feather will be found in the article Bird (vol. iii. p. 630). Here cognizance is taken of the purposes only to which feathers are applied either for use or ornament. These applications are numerous and varied, arising, as they do in some cases, from the physical properties of the quill, and again from the structure and elasticity of the vane; while for ornamentation, sometimes beauty of form, and oftener brilliancy of color, are the qualities which commend different feathers for use. The chief purposes for which feathers become commercially valuable may be comprehended under four divisions:—1st, bed and upholstery feathers; 2d, quills for writing; 3d, ornamental feathers; and 4th, miscellaneous uses of feathers.

Bed and Upholstery Feathers.—The qualities which render feathers available for stuffing beds, cushions, etc., are lightness, elasticity, freedom from matting, and softness. These are combined in the most satisfactory degree in the feathers of the goose and of several other allied aquatic birds whose bodies are protected with a warm downy covering. Goose feathers and down, when plucked in spring from the living bird, are most esteemed, being at once more elastic, cleaner, and less liable to taint than those obtained from the bodies of killed geese. The down of the eider duck, *Anas mollissima*, is esteemed above all other substances for lightness, softness, and elasticity; but it has some tendency to mat, and is consequently more used for quilts and in articles of clothing than unmixed for stuffing beds. The feathers of swans, ducks, and of the common domestic fowl are also largely employed for beds; but in the case of the latter bird, which is, of course, non-aquatic, the feathers are harsher and less downy than are those of the natatorial birds generally. Feathers which possess strong or stiff shafts cannot, without some preliminary preparation, be used for stuffing purposes, as the stiff points they present would not only be highly uncomfortable, but would also pierce and cause the escape of the feathers from any covering in which they might be enclosed. The barbs are therefore stripped or cut from these feathers, and when so prepared they, in common with soft feathers and downs, undergo a careful process of drying and cleaning, without which they would acquire an offensive smell, readily attract damp, and become a refuge for vermin. The drying is generally done in highly heated apartments or stoves, and subsequently the feathers are smartly beaten with a stick, and shaken in a sieve to separate all dust and small débris. Bed feathers come to the British market most largely from Germany; in Russia geese are kept almost exclusively on account of their feathers and quills; and from that country as well as France large quantities of goose and other upholstery feathers are obtained. The fine down of the eider duck obtained from high latitudes, as already mentioned, is principally consumed in bed quilts and for down-quilted articles of ladies' attire.

Quills for Writing.—The earliest period at which the use of quill feathers for writing purposes is recorded is the 6th century; and from that time till the introduction of steel pens in the early part of the present century they formed the principal writing implements of civilized communities. It has always been from the goose that quills have been chiefly obtained, although the swan, crow, eagle, owl, hawk, and turkey all have more or less been laid under contribution. Swan quills, indeed, are better and more costly than are those from the goose, and for fine lines crow quills have been much employed. It is only the five outer wing feathers of the goose that are useful for writing, and of these the second and third are the best, while left-wing quills are also generally more esteemed than those of the right wing, from the fact that they curve outward and away from the writer using them. Quills obtained in spring, by plucking or otherwise, from living birds are by far the best, those taken from dead geese, more especially if fattened, being comparatively worthless. To take away the natural greasiness, to remove the superficial and internal pellicles of skin, and to give the necessary qualities of hardness and elasticity, quills require to undergo some processes of preparation. The essential operation consists in heating the quills, generally in a fine sand-bath, to from 130° to 180° Fahr. according to circumstances, and scraping them under pressure while still soft from heat, whereby the outer skin is removed and the inner shrivelled up. If the heating has been properly effected, the quills are found on cooling to have become hard, elastic, and somewhat brittle. While the quills are soft and hot, lozenge-shaped patterns, ornamental designs, and names are easily and permanently impressed on them by pressure with suitable instruments or designs in metal stamps.

Ornamental Feathers.—Feathers do not appear to have been much used, in Europe at least, for ornamental purposes till the close of the 13th century. They are found in the conical caps worn in England during the reigns of Edward III. and Richard II.; but not till the period of Henry V. did they take their place as a part of military costume. Towards the close of the 15th century the fashion of wearing feathers in both civil and military life was carried to an almost ludicrous excess. In the time of Henry VIII. they first appeared in the bonnets of ladies; and during Elizabeth's reign feathers began to occupy an important place as head-dress ornaments of women. From that time down to the present, feathers of endless variety have continued to be leading articles of ornamentation in female head-attire; but, except for military plumes, they have long ceased to be worn in ordinary male costume. At the present day it is scarcely too much to say that all feathers of all birds are, in one way or other, turned to account by ladies for the purpose of personal ornament. Ostrich feathers, however, hold, as they have always held, a pre-eminent position among ornamental feathers; and the ostrich is the only bird which may be said to be reared exclusively for the sake of its feathers. Ostrich farming is now recognized as one of the established industries of South Africa. On these farms the birds are hatched by artificial incubation from eggs which are valued at £5 each. The birds are estimated to be worth about £30 apiece, a fine full-grown male being valued as high as £75. The birds begin to yield feathers when about a year old, and continue to an advanced age to produce two crops of plumes annually of a present yearly average value of £15. The feathers are generally plucked from the living animal—a process which does not appear to cause any great inconvenience. In the male bird, the long feathers of the rump and wings are white, and the short feathers of the body are jet black; while the rump and wing feathers of the female are white tinged with a dusky gray, the general body color being the latter hue. The feathers of the male are consequently much more valuable than those of the female, and they are separately classified in commerce. The art of the plumassier embraces the cleaning, bleaching, dyeing, curling, and making up of ostrich and other plumes and feathers. White feathers are simply washed in bundles in hot soapy water, run through pure warm water, exposed to sulphurous fumes for bleaching, thereafter blued with indigo solution, rinsed in pure cold water, and hung up to dry. When dry the shafts are pared or scraped down to give the feathers greater flexibility, and the barbs are curled by drawing them singly over the face of a blunt knife or by the cautious application of a heated iron. Dull-colored feathers are usually dyed black with logwood and sulphate or acetate of iron. Feathers which are dyed light colors are first bleached by exposure in the open air, and the dyes employed are the same as those for other animal substances. Much ingenuity is displayed in the making up of plumes, with the general result of producing the appearance of full, rich, and long feathers from inferior varieties and from scraps and fragments of ostrich feathers; and so dexterously can factitious plumes be prepared that only an experienced person is able to detect the fabrication.

To enumerate all the feathers used for ornamental purposes would be practically to give a complete list of all known and obtainable birds; but there are a few in addition to those of the ostrich which form steady articles of commercial demand. Among these are the feathers of the South American ostrich, *Rhea americana*, the marabout feathers of India obtained from *Leptoptilos argala* and *L. javanica*, the feathers of the various species of birds of paradise, and of numerous species of humming-birds. Swan-down and the skins of various penguins and grebes and of the albatross are used, like fur, for muffs and collarettes.

The Chinese excel in the preparation of artificial flowers and other ornaments from bright natural-colored or dyed feathers; and the French also skilfully work fragments of feathers into bouquets of artificial flowers, imitation butterflies, etc.

Miscellaneous Applications of Feathers.—Quills of various sizes are extensively employed as holders for the sable and camel hair brushes used by artists, etc. Feather brushes and dusters are made from the wing-feathers of the domestic fowl and other birds; those of a superior quality, under the name of vulture dusters, being really made of American ostrich feathers. A minor application of feathers is found in the dressing of artificial fly-hooks for fishing. As steel pens came into general use it became an object of considerable importance to find applications for the supplanted goose-quills; and in this quest no one was more deeply interested than M. Bardin, of Joinville le Pont near Paris, whose establishment sent out about 20,000,000 quills annually—the product of 2,000,000 geese. M. Bardin competed with the steel-pen makers by cutting several pens of the shape of metallic pens from each quill, but more largely he devoted himself to the preparation of quill tooth-picks. The cutting up of the feathers in this way leaves the shaft and barbs unused, and these he utilized in various ingenious ways,—the principal products being a kind of mat into which the barbs are woven, the shafts yielding a fibrous substance not unlike hogs' bristles, from which useful brushes are fabricated. (J. PA.)

FEBRUARY, the second month of the year. In ordinary years it contains 28 days; but in bissextile or leap year, by the addition of the intercalary day, it consists of 29 days. This month was not in the Romulian calendar. In the reign of Numa two months were added to the year, namely, January at the beginning, and February at the end; and this arrangement was continued until 452 B.C., when the decemvirs placed February after January. The ancient name of *Februarius* was derived from the verb *februaré*, to purify, or from *Februa*, the Roman festival of general expiation and lustration, which was celebrated during the latter part of this month. In February also the Lupercalia were held, and women were purified by the priests of Pan Lyceus at that festival. The most generally noted days of February are the following:—the 2d, Candlemas Day, one of the fixed quarter days used in Scotland; the 14th, St. Valentine's Day; and the 24th, St. Matthias. The church festival of St. Matthias was formerly observed on the 25th of February in bissextile years, but it is now invariably celebrated on the 24th.

FÉCAMP, a seaport-town of France, department of Seine-Inférieure, is situated on the English Channel, at the mouth of the small river Fécamp, 23 miles N.N.E. of Havre. The town consists almost entirely of one street, which is upwards of two miles in length. It occupies the bottom and sides of a narrow valley, opening out towards the sea between two high cliffs, on one of which stands a lighthouse. Its port, though small, is one of the best on the Channel, and has been greatly improved by the construction of an inner port with a fine quay. It carries on a considerable trade in Baltic and colonial produce, and in brandy and salt, and sends out vessels to the whale, cod, mackerel, and herring fisheries. In 1875 there entered the port 167 vessels, with a total tonnage of 26,321. The river affords abundant water-power for numerous cotton, oil, and other mills. Fécamp has also sugar refineries, tanneries, forges, and building docks, and manufactures of hardware, candles, and soda. The church is a large and handsome edifice; and the other principal buildings are the sea-bathing establishment, the theatre, the hospital, and the Institute for Poor Sisters. The Latin name of Fécamp was Fiscarium or Fiscanium; and the town owes its origin to a nunnery which was founded in 664, destroyed by the Normans in 841, and rebuilt for a Benedictine abbey by Richard I., duke of Normandy, in 998. The population in 1872 was 12,651.

FECKENHAM, or FECKNAM, JOHN DE, the last abbot of Westminster, was born of poor parents in Feckenham Forest in Worcestershire. The family name was Howman; and it is noted by Fuller (*Worthies of England*) that the abbot was the last clergyman who was "locally surnamed." He was of good parts and fond of learning; and, after receiving instruction from the parish priest, he was sent to the Benedictine monastery of Evesham, whence, at about the age of eighteen, he passed to Gloucester College, Oxford. He afterwards returned to Evesham, and there remained till the dissolution of the monastery in 1536, when he received a pension of a hundred florins. Resuming his studies at Oxford, he took in 1539 his degree of B.D. He was successively chaplain to Bell, bishop of Worcester, and to Bonner, bishop of London. When the latter was deprived of his see (1549), Feckenham was committed to the Tower. His learning and eloquence, however, made him so weighty an advocate that he was temporarily liberated ("borrowed from the Tower," he says in old English phrase) for the purpose of holding discussions on the points in dispute between Romanists and Protestants. Among these disputations were four with Hooper, bishop of Worcester. Remanded to the Tower, he was released at the accession of Queen Mary and became her chaplain. In rapid succession he was appointed chaplain to Bishop Bonner and prebendary and dean of St. Paul's. He was sent to Lady Jane Grey two days before her execution to commune with her, and "to reduce her," says Fox, "from the doctrine of Christ to Queen Mary's religion;" and two months later he was one of the disputants at Oxford against Cranmer, at the martyrdom of Ridley and Latimer. He showed, however, no eagerness of hostility to the martyrs; and indeed throughout Queen Mary's reign he distinguished himself by generous endeavors in behalf of the persecuted reformers. He also pleaded earnestly for the release of the Lady Elizabeth, thereby offending the queen. In May, 1556, the degree of D.D. was conferred upon him by the university of Oxford; and in September following he was made abbot of Westminster, fourteen Benedictine monks being placed under him. Queen Elizabeth on her accession (1558) sent for the abbot and offered him, it is said, the archbishopric of Canterbury, but he could not conform to the new faith. He sat in her first parliament, and was the last mitred abbot that was seen in parliament. His influence there was steadfastly directed against all movements of reformation. In 1560 he was sent to the Tower, and, with intervals of freedom, remained in confinement more or less strict for the rest of his life. He died in Wisbeach Castle, in the Isle of Ely, in 1585. Among the few pieces published by Feckenham are the *Conference-Dialogue* held between the Lady Jane Grey and himself, and several funeral orations or sermons.

FEDCHENKO, ALEXIS PAULOWITCH (1844–1873), a Russian naturalist and traveller, well known for his explorations in Central Asia. He was born at Irkutsk, in Siberia, on 7th February, 1844; and, after attending the gymnasium of his native town, proceeded to the university of

Moscow, for the study more especially of zoology and geology. In 1868 he travelled through Turkestan, the district of the lower Sír-Darya, and Samarcand; and shortly after his return he set out for Khokand, where he visited a large portion of territory till then unknown. Soon after his return to Europe he perished on Mont Blanc while engaged in an exploring tour in Switzerland, 15th September, 1873.

Accounts of the explorations and discoveries of Fedchenko have been published by the Russian Government,—his *Journeys in Turkestan* in 1874, *In the Khanat of Khokand* in 1875, and *Botanical Discoveries* in 1876. See Petermann's *Mittheilungen*, 1872–74.

FEDERAL GOVERNMENT. A federal union of sovereign states for mutual aid, and the promotion of interests common to all, is a procedure so consistent with self-interest that examples of it can be adduced from very early times. Had a federal union of Hellenic states been effected at the close of the Persian war, results would have been achieved which were vainly aimed at subsequently,—as by Athens herself, after the capture of Olynthus by Philip of Macedon. The effort to effect a union of states for the common good then failed; but at length, in the century following the death of Alexander, the Ætolian and Achæan confederacies were formed, and a spirit of unity was inspired which, if less tardily manifested, might have long perpetuated Hellenic freedom. For the first time a federative spirit contended effectively with the isolation which had so long animated the policy of the ancient world.

Aristotle collected the constitutions of 150 governments of the time of Alexander, including many cities bounded by their own walls, and, like the mediæval republics of Italy, standing for centuries almost within sight of each other without a thought of union except by conquest of the weaker by the stronger. The Panhellenic festivals long served to perpetuate a fraternal pride in the community of Hellenic blood, but they begot no results of sustained political unity. But when Macedonian ambition raised up a military empire on their own frontier stronger and far more dangerous than that of Persia, the statesmen of Greece learned the necessity of confederation for the safety of their autonomous governments. Of the unions which followed, the two most celebrated were the Ætolian league and the confederacy of Achæans. The constitution of the Ætolian league, though democratic, included an aristocratic or privileged class. It was a league of districts rather than of cities, with chiefs of the hill tribes and leading citizens attending the annual assemblies at Thermus, and might not inaptly be compared to the Swiss confederacy of city and forest cantons. The Spartans alone compared with the Ætolians in their prolonged maintenance of the power of independent action and self-government.

The Achæan league differed from that of the Ætolians in being one of cities. Grote speaks of it as never attaining to anything better than a feeble and puny life. But it gave good evidence of the benefits of federation. From remote times twelve towns had acknowledged confederate rights and obligations; in 275 B.C. other cities joined; and the importance of the confederacy continued to increase till 251 B.C., when Aratus became strategus, and brought his native Sicyon into the union. Upwards of seventy cities, while still controlling their own local affairs, were by this means associated under one federal government. The federal capital was at Ægium, and each city sent deputies annually thither till 194 B.C., when Philopœmen introduced the system of meeting by rotation in the principal cities, a procedure originating in jealousy, and the inevitable source of weakness.

Among the later European confederations the Swiss republic attracts most attention. As now constituted it consists of twenty-two sovereign states or cantons. The government is vested in two legislative chambers, a senate or council of state, and a national council, constituting unitedly the federal assembly. The executive council of seven members elects the president and vice-president for a term of three years. Before the French Revolution the German empire was a complex confederation, with the states divided into electoral colleges, consisting—(1) of the ecclesiastical electors and of the secular electors, including the king of Bohemia; (2) of the spiritual and temporal princes of the empire next in rank to the electors; and (3) of the free imperial cities. The emperor was elected by the first college alone. This imposing confederation came to an end by the conquests of Napoleon; and the Confederation of the Rhine was established in 1806 with the French emperor as protector. But its principles were violated by its so-called protector, and in 1815 the Germanic confederation was established by the Congress of Vienna, which in its turn has been displaced by the present German empire. This, in its new organization, has conferred on Germany the long-coveted unity and coherence the lack of which had been a source of weakness. The constitution dates, in its latest form, from the treaties entered into at Versailles in 1871. A federation was then organized with the king of Prussia as president, under the hereditary title of emperor of Germany. Delegates of the various confederated Governments form the Bundesrath; the Reichstag, or popular assembly, is directly chosen by the people; and the two assemblies constitute the federal parliament. This body has power to legislate for the whole empire in reference to all matters connected with the army, navy, postal service, customs, coinage, etc., all political laws affecting citizens, and all general questions of commerce, navigation, passports, etc. The emperor represents the confederacy in all international relations, with the chancellor as first minister of the empire, and has power, with consent of the Bundesrath, to declare war in name of the empire.

The United States of America more nearly resembles the Swiss confederacy, though retaining marks of its English origin. The original thirteen States were colonies wholly independent of each other. By the Articles of Confederation and Perpetual Union between the United States of America, drawn up by Congress in 1777, the States bound themselves in a league of common defence; a common citizenship was recognized for the whole union; but each State reserved its sovereignty along with every power not expressly delegated to Congress, and the jealousy in regard to States' rights has never been entirely laid aside. The theory of the confederacy is that of a federal republic formed by the voluntary union of sovereign States. The powers of the central government are determined by a written constitution, and are intrusted to three distinct authorities—executive, legislative, and judicial. The president, elected for a term of four years by electors chosen for that purpose by each State, is the representative head of the republic. The vice-president, *ex-officio* president of the senate, assumes the presidency in case of resignation or death. Legislative power is vested in the senate, composed of two members elected by each State for a term of six years; and in the Congress, consisting of representatives in numbers proportionate to the population of each State, holding their seats for two years. The supreme judicial authority, which forms the final court of appeal on all constitutional as well as legal questions, consists of a chief justice and eight judges, appointed for life by the president, subject to confirmation by the senate.

The essential principle involved in confederation is that it is a union of sovereign states. With a view to the common interests of all, they agree to abrogate certain functions of sovereignty in their separate capacity, in order that these shall be jointly exercised for the common good by the body which they concurrently vest with such sovereign functions; but all other sovereign rights are reserved. This differs essentially from the incorporation of two or more states into a united commonwealth, as in the union of England and Scotland. The new empire of Germany illustrates the former, the new kingdom of Italy the latter. In view of the sovereign rights reserved by the several members of a federal union of states, each may be presumed to have the right to withdraw from the confederation. State rights, including that of secession, were strongly asserted during the civil wars between the northern and southern States of America; but the result has naturally been to subordinate the will of individual States to the higher interests of the confederacy as a whole. The written constitution of the United States is subject to amendment at any time, by consent of two-thirds of both representative bodies; or by a convention specially called by the legislatures of two-thirds of the several States for the purpose.

The extension of responsible constitutional government by Great Britain to her chief colonies, under a governor or viceregal representative of the crown, has been followed in British North America by the union of the Canadian, maritime, and Pacific provinces under a federal government,—with a senate, the members of which are nominated by the crown, and a house of commons elected by the different provinces according to their relative population.

The governor-general is appointed by the crown for a term of seven years, and represents the sovereign in all matters of federal government. The lieutenant-governors of the provinces are nominated by him; and all local legislation is carried on by the provincial parliaments. The remarkable confederation of the Dominion of Canada, which has thus originated, presents the unique feature of a federal union of provinces practically exercising sovereign rights in relation to all local self-government, and sustaining a constitutional autonomy, while cherishing the colonial relationship to Great Britain. History has no parallel to this novel fact of a free people, the occupants of vast regions stretching from the Atlantic to the Pacific, enjoying all constitutional rights, electing their own parliaments, organizing an armed militia, controlling customs, emigration, and all else that pertains to independent self-government, while they continue to cherish the tie which binds them to the mother country, and to render a loyal homage to the representative of the crown. The harmonious relations resulting from this application of the system of federal government to the British American provinces has suggested the extension of the same principle to the colonies of South Africa, and may be regarded as the basis of a colonial system by means of which the vast colonial dependencies of Great Britain may perpetuate their relations with the mother country, while enjoying all the blessings of its well-regulated freedom, or may be trained to emulate its example as independent states. (D. W.)

FEDERICI, Camillo (1749–1802), Italian dramatist and actor, was born at Garessio, a small town in Piedmont, April 9, 1749. His real name was Giovanni Battista Viassolo, and that by which he is now known and which he transmitted to his children was taken from the title of one of his first pieces, *Camillo e Federico*. He was educated at Turin, and showed at an early age a great fondness for literature and especially for the theatre. The praises bestowed on his early attempts determined his choice of a career, and he obtained engagements with several companies both as writer and actor. He made a happy marriage in 1777, and soon after left the stage and devoted himself entirely to composition. He settled at Padua, and the reputation of his numerous comedies rapidly spread in Italy, and for a time seemed to eclipse that of his predecessors. Most of his pieces were of the melodramatic class, and he too often resorted to the same means of exciting interest and curiosity. He caught, however, something of the new spirit which was manifesting itself in German dramatic literature in the works of Schiller, Iffland, and Kotzebue, and the moral tone of his plays is generally healthy. Fortune did not smile upon him; but he found a helpful friend in a wealthy merchant of Padua, Francis Barisan, for whose private theatre he wrote many pieces. He was attacked in 1791 with a dangerous malady which disabled him for several years; and he had the misfortune to see his works, in the absence of any copyright law, published by others without his permission. At length, in 1802, he undertook to prepare a collected edition; but of this four volumes only were completed when he was again attacked with illness, and died at Padua (December 23). The publication of his works was completed in 14 volumes in 1816. Another edition in 26 volumes was published at Florence in 1826–27. A biographical memoir of Federici by Neymar appeared at Venice in 1838.

FEE (*feodum*), in English law, signifies an estate of inheritance (*i.e.*, an estate descendable to the heirs of the grantee so long as there are any in existence), as opposed to an estate for life. In a more primary sense it means an estate by tenure (land holden of a lord) as opposed to land owned allodially. See Digby's *History of the Law of Real Property*, p. 50, and the article Estate.

FEHMIC COURTS (Fehmgerichte or Vehmgerichte), celebrated secret tribunals which flourished in Germany from the end of the twelfth century to the middle of the 16th, and which, from the extent of their organization and the mystery which surrounded their proceedings, inspired a feeling of dread in all who came within their jurisdiction. Their origin is uncertain. The traditional account is that they were instituted by Charlemagne and Pope Leo III. to prevent the Saxons from relapsing into paganism. It is more probable that they arose from the relics of the ancient Teutonic free courts. Their immediate cause, however, is to be found in the utter lawlessness and disregard of authority then prevailing in Germany, which obliged the weak and the peace-loving to band themselves together as protection against the outrages of the princes and nobles. The birthplace of the Fehmic courts was Westphalia, where they appeared shortly after the deposition of Henry the Lion in 1179. The duchy was in consequence of this event annexed to the archbishopric of Cologne, and the archbishops appear to have had a good deal to do with the origination of the courts. Fehmic courts subsequently made their way into most other parts of Germany, but the institution never seems to have succeeded in gaining a firm footing outside the limits of Westphalia, or the Red Land, as it was called. Within this district, however, which included nearly the entire country between the Rhine and the Weser, they soon acquired an immense power, which was at first used only in a beneficial and upright manner, supplying a means of redress at a time when the public administration of justice was in abeyance. But in the end, as might have been anticipated, the secrecy of their proceedings and the arbitrary nature of their rules converted them into an instrument of tyranny in the hands of the very persons whose lawless deeds they were designed to suppress. The emperors themselves, who had at first encouraged the Fehmic courts, finding them a useful means of keeping their feudal dependants in check, were unable directly to resist their encroachments; and it was only with the restoration of public order and the establishment of a regular judicature that the influence of the Fehmgerichte gradually waned. The last regular court is said to have been held at Celle, in Hanover, in 1568; but there are traces of the institution at a much later date; and in the present century even, a relic of the once famous Fehmgerichte was to be found in Westphalia in the form of a society for the suppression of vice. It was abolished by order of Jerome Bonaparte in 1811.

It was necessary that a candidate for initiation into the Fehm should be born in wedlock, that he should be a Christian, and neither excommunicated nor outlawed, and that he should not be a party to any process before a Fehmic court. Originally only natives of Westphalia were admitted. At initiation the candidate took a solemn oath to support with his whole powers the Holy Fehm, to conceal its proceedings "from wife and child, father and mother, sister and brother, fire and wind, from all that the sun shines on and the rain wets, and from every being between heaven and earth," and to bring before the tribunal everything within his knowledge that fell under its jurisdiction. He was then initiated into the signs by which the members recognized each other, and was presented with a rope and a knife, upon which were engraved the mystic letters S.S.G.G., whose signification is still involved in doubt, but which are supposed to mean *Strick, Stein, Gras, Grein*. The emperor was the nominal head of the Fehmic courts. Under him the supreme president was the archbishop of Cologne as duke of Westphalia. The whole country over which the jurisdiction of the Fehmic courts extended was divided into districts, in each of which there was at least one court presided over by a judge called a Freigraf, or free count. Along with him sat an indefinite number of assessors, but never less than seven, called Freishöffen, or Freischöppen, in Latin *scabini*. These Freischöffen had the duty of bringing complaints before the courts, and of carrying into execution the sentences which were pronounced. There were two distinct sorts of Fehmic courts,—one which held its sittings openly, and another whose proceedings were conducted in secret. The open court, in one of its branches, exercised a jurisdiction in civil suits and over offences of a trifling description, in which cases it was unnecessary that either plaintiff or defendant should be a member of the Fehm. The other branch of the open court took cognizance of all crimes of an ordinary nature. The accuser was always one of the Freischöffen. The accused was cited by nailing the summons during night to the door of his house, or, if it was not known where he lived, by fixing four copies upon a post at cross roads near his supposed abode. If the accused appeared, the accuser stated the case, and the investigation proceeded by the examination of witnesses as in an ordinary court of law. The judgment was put into execution on the spot if that was possible. The secret court, from whose procedure the whole institution has acquired its evil character, was closed to all but the initiated; any one not a member on being discovered was instantly put to death, and the members present were bound under the same penalty not to disclose what took place. Crimes of a serious nature, and especially those that were deemed unfit for ordinary judicial investigation—such as heresy and witchcraft—fell within its jurisdiction, as also did appeals by persons condemned in the open courts, and likewise the cases before those tribunals in which the accused had not appeared. The accused if a member could clear himself by his own oath, unless he had revealed the secrets of the Fehm. If he were one of the uninitiated it was necessary for him to bring forward witnesses to his innocence from among the initiated, whose number varied according to the number on the side of the accuser, but twenty-one in favor of innocence necessarily secured an acquittal. The only punishment which the secret court could inflict was death. If the accused appeared, the sentence was carried into execution at once; if he did not appear, it was quickly made known to the whole body, and the Freischöffe who was the first to meet the condemned was bound to put him to death. A knife with the cabalistic letters was left beside the corpse to show that the deed was not a murder.

See Wigand, *Das Fehmgericht Westphalens*, 1825, and Usener, *Die Frei und Heimlichen Gerichte Westphalens*, 1832; also Scott's *Anne of Geierstein*, introduction and chap. xx. (H. J. E. F.)

FEITAMA, Sybrand (1694–1758), a Dutch author, was born at Amsterdam, December 10, 1694. He was originally intended for the ministry, but eventually adopted a commercial career. In middle life, having made a sufficient fortune, he retired from business, and dedicated his remaining years to literature, and to a circle of friends that included all the most eminent of his younger contemporaries. In 1733 he published his translation of *Télémaque*, to which he had given twenty years of revision. In 1735 appeared two volumes of his *Stage Poems*, original dramas for reading rather than acting. In 1743 was issued the first draft of his translation of the *Henriade*, in perfecting which he spent nearly a quarter of a century. Three volumes of his *Posthumous Poems* appeared in 1764. He died at Amsterdam on the 3d of June, 1758. The influence of Feitama over Dutch literature was very extensive and very pernicious. He was a cold and rhetorical versifier, a learned trifler, and hopelessly wedded to the French tradition. His two great translations, which are indeed admirably performed from his own standpoint, have long outlived their immense popularity in the last century.

FEITH, Rhijnvis (1753–1824), a Dutch poet, was of aristocratic extraction, and was born at Zwolle, the capital of the province Overijssel, on the 7th of February, 1753. It has been said with truth that his whole life was a model of social, personal, and literary good fortune; there has never lived a poet who enjoyed more unbroken prosperity. This is the more noticeable, because of all the important writers of Holland he is the one whose works are most full of melancholy and despair. He was educated at the universities of Harderwijk and Leyden, and took his degree at the latter in 1770. In 1772 he settled at his birthplace, and married. In 1780, in his twenty-seventh year, he became burgomaster of Zwolle, a post which he held for the remainder of his life. He built a luxurious villa, which he named Boschwijk, in the outskirts of the town, and here he lived in the greatest comfort. His first important production was *Julia*, in 1783, a novel written in emulation of *Werther*, and positively steeped in *Weltschmerz* and despair. This was followed in 1784 by the tragedy of *Thirsa*, the first of his dramatic poems. The next year was one of great mark in Feith's career: he published *Ferdinand and Constantia*, another Werther novel, and *The Patriots*, a tragedy. Both were very successful, and his poems were publicly crowned at Leyden. He was now the most popular poet in Holland, and this fact, combined with his burning patriotism, drew upon him the hatred of Bilderdijk. Other writers attacked his morbid melancholy, and in 1786 the critic Baron van Perponcher made a trenchant assault on him in a work on sentimentality. He was accordingly silent for some time, but in 1791 he printed a tragedy of *Lady Johanna Gray;* and in 1792 there appeared a portentous didactic poem, *The Grave*, in four cantos, which belongs to the most tearful school of churchyard poetry. In 1793 and in 1795 he produced his tragedies of *Ines de Castro* and *Mucius Cordus*, the first taken from an episode in the *Lusiad*, the second composed in honor of the Batavian republic. From 1796 to 1814 appeared five volumes of *Odes and Miscellaneous Poems*. In 1802 he published another didactic poem, *Old Age*, in six cantos, and in 1804 *Poems for Public Worship*. He died on the 6th of February, 1824. The next year a statue of the poet, the work of Gabriel, was erected in Zwolle, and an edition of his poetical works issued in thirteen volumes. As one of the most prominent members of the revival of Dutch letters, and as a fluent and careful verse-writer, Feith will always be honorably remembered. His own age accounted him one of the greatest of poets, but posterity has refused to indorse this judgment. His romantic inspiration was borrowed from Germany, and he did not hesitate to imitate Goethe, Wieland, and Novalis. It must be recollected, however, that these men were his immediate contemporaries, and that he showed great alacrity and acumen in perceiving the modern direction of their genius.

FEJÉR, Gyorgy (1766–1851), one of the most indefatigable Hungarian authors of the last generation, was born on the 23d April, 1766, at Kescthely, in the county of Zala. After finishing his scholastic course at the gymnasium he went to Pesth, where he attended the philosophical lectures at the university. From 1785 to 1790 he studied theology at Pressburg, after which he was engaged for some time as a private family tutor. From 1802 to 1804 he taught dogmatic theology at Stuhlweissenburg, where he for many years officiated as priest; and in 1808 he obtained a theological professorship at Pesth university. Ten years later (1818) he became chief director of the educational circle of Raab, and in 1824 was appointed librarian to the university of Pesth. Fejér was the most prolific of Hungarian authors,—his works, which are nearly all written either in Latin or Hungarian, exceeding 180 in number. They treat of numerous subjects, and are of various sizes, from mere pamphlets to several volumes. His most important work, *Codex diplomaticus Hungariæ ecclesiasticus ac civilis*, published from 1829 to 1844, in eleven so-called tomes, really exceeds forty volumes. It consists of old documents and charters from 104 A. D. to the end of 1439, and forms an extraordinary monument of patient industry. This work and many others relating to Hungarian national history have placed Fejér in the foremost rank of Hungarian historians. He died on the 2d July, 1851. His latest works were *A Kunok eredete* (*The Origin of the Huns*), and *A politikai forradalmak okai* (*The Causes of Political Revolutions*), both published in 1850. The latter production, on account of its liberal tendencies, was suppressed by the Austrian Government.

See *Magyar Irók: Életrajz-gyüjtemény*, Pesth, 1856, and *A magyar nemzeti irodalomtörténet vázlata*, Pesth, 1861.

FELDKIRCH, the chief town of the Vorarlberg district of Tyrol in Austria, is situated at the junction of the valley of the Ill with the valley of the Rhine, about 6½ miles above the confluence of the two rivers. The position is one of much natural beauty and also of great military strength; and the town has consequently been of far more importance than is indicated by its size. It is the seat of a number of administrative offices, the residence of a bishop, and the centre of a considerable transit trade. Among its own industries are cotton-spinning, weaving, bell-founding, copper-smithery, engineering, coopering, and the manufacture of *Kirschwasser*. The principal buildings are the parish church (which dates from 1487 and possesses a Descent from the Cross assigned to Holbein), a Capuchin monastery and church, a Jesuit seminary (the *Stella Matutina*, or Morning Star), a charity hospital with bathing establishment attached, and the *Kurhaus* with its park. To the east of the town lie the ruins of the castle of Schattenburg, and about a mile to the south begins the territory of the prince of Lichtenstein. Feldkirch, or rather Schattenburg, was at one time the seat of the counts of Montfort, but in 1377 it was sold by Count Rudolph VII. to the dukes of Austria. In 1799 the Feldkirch pass was the scene of an indecisive conflict between the Austrians under Hotze and Jellalich and the French under Oudinot and Massena; and in 1805 the Austrian forces under Wolfskehl were obliged to capitulate in the neighborhood. The population, almost exclusively Catholic, numbered 2868 in 1869.

FÉLEGYHÁZA, chief town of the former district of Little Cumania, in Hungary, about 66 miles S.E. of Pesth, 46° 41′ N. lat., 19° 52′ E. long., is advantageously situated on the railroad between Pesth and Szegedin. Amongst the principal edifices are a fine town-hall, a Roman Catholic gymnasium, and a large parish church. The surrounding country is covered with vineyards, fruit-gardens, and tobacco and corn fields, which are the principal source of employment to the inhabitants; but the town itself is chiefly noted for its great cattle-market. Numerous ancient Roman urns and other relics have been dug up in the vicinity of the town. In the 17th century Félegyháza was completely destroyed by the Turks, nor was it recolonized and rebuilt till 1743. The population, by the latest census (December 31, 1869), amounted to 21,313, chiefly Roman Catholics and by nationality Magyars.

FÉLIBIEN, ANDRÉ (1619-1695), Sieur des Avaux et de Javercy, French architect and historiographer, was born at Chartres in May, 1619. At the age of fourteen he went to Paris to continue his studies; and in 1647 he was sent to Rome in the capacity of secretary of embassy to the Marquis de Marueil. His residence at Rome he turned to good account by diligent study of its ancient monuments, by examination of the literary treasures of its libraries, and by cultivating the acquaintance of men eminent in literature and in art. Amongst these especially to be noted was Nicholas Poussin, whose friendship and counsels were of great value to him. On his return to France he married, and was ultimately induced, in the hope of employment and honors, to settle at Paris. Colbert, the great minister, recognized his abilities; and he was one of the first members (1663) of the Academy of Inscriptions. Three years later Colbert procured him the appointment of historiographer to the king. In 1671 he was named secretary to the newly founded Academy of Architecture, and in 1673 keeper of the cabinet of antiques in the palace of Brion. To these offices was afterwards added by Louvois that of deputy controller-general of roads and bridges. Félibien found time in the midst of his official duties for study and research, and produced many literary works. Among these the best and the most generally known is the *Entretiens sur les vies et sur les ouvrages des plus excellents peintres anciens et modernes*, which appeared in successive livraisons, the first in 1666, and the fifth in 1688. It was republished with several additions at Amsterdam in 1706, and again at Trévoux in 1725. Félibien wrote also *Origine de la Peinture* (1660), *Principes de l'architecture, de la sculpture, de la peinture*, etc. (1676-90), and descriptions of Versailles, of La Trappe, and of the pictures and statues of the royal residences. He edited the *Conférences* of the Academy of Painting, and translated the *Castle of the Soul* from the Spanish of St. Theresa, the *Life of Pius V.* from the Italian, etc. His personal character commanded the highest esteem, agreeing with the motto which he adopted—*Bene facere et vera dicere*. He died at Paris, June, 11, 1695.

FÉLIBIEN, DOM MICHEL (1666-1719), French historian, was a son of André, and was born at Chartres, September 14, 1666. After studying at the Collége des Bons-Enfants at Paris, he entered, at the age of sixteen, the Benedictine congregation of St. Maur. He devoted himself to a studious life, and produced in 1706 the learned *Histoire de l'Abbaye royale de Saint-Denis en France*. Drawn from original sources, and illustrated with engravings, it at once attracted attention, and made him a reputation as a scholar. He was soon after selected by Bignon, provost of the merchants of Paris, to write a history of that city, and notwithstanding his broken health he undertook the task. In 1713 he put forth his *Projet d'une histoire de la ville de Paris*, which was approved by Louis XIV. He steadily continued his labors for six years longer, but did not live to finish the work. He died at St. Germain des Près, September 25, 1719. His *History of Paris*, which was far advanced, was completed by Lobineau assisted by De Varigny, former secretary to Félibien, and was published in 5 vols. fol. in 1725 (not 1755, as stated by most of the authorities). Dom Michel was the author of several other works of less importance.

FELIX, the name of several popes.

FELIX I., a Roman by birth, succeeded Dionysius in the papal chair in December, 269. Regarding his pontificate there is little authentic information, but he is said to have given ecclesiastical sanction to the yearly celebration of the mass over the graves of the martyrs, a custom, however, which had been previously in existence; and the law regarding the consecration of churches is also ascribed to him. On account, it is said, of his having strongly supported the Christians during the persecutions under Aurelius, he was enrolled among the martyrs, his day being the 20th of May. He died in 274. A fragment of a letter to Maximus, bishop of Alexandria, in support of the doctrines of the Trinity and Incarnation against the arguments of Paul of Samosata, was in all probability written by Felix, but other three letters ascribed to him are certainly ungenuine.

FELIX II. (?), pope or antipope, was in 356 raised from the archdeaconate of Rome to the papal chair, when Tiberius was banished by the emperor Constantius for refusing to subscribe the sentence of condemnation against Athanasius. His election was contrary to the wishes both of the clergy and of the people, and the consecration ceremony was performed by certain prelates belonging to the court. In 357 Constantius, at the urgent request of an influential deputation of Roman ladies, agreed to the release of Tiberius on condition that he signed the semi-Arian creed. Constantius also issued an edict to the effect that the two bishops should rule conjointly, but Tiberius, on his entrance into Rome in the following year, was received by all classes with so much enthusiasm that Felix found it necessary to retire at once from Rome. Regarding the remainder of his life little is known, and the accounts handed down are contradictory, but he appears to have spent the most of it in retirement at his estate near Porto. He died in 365, and, on what grounds it is impossible to determine, was enrolled amongst the number of martyrs, his day being the 22d of July. In the reign of Gregory XIII. the claim of Felix to rank among the popes was discussed, and in order to discover whether any miraculous help was to be found to aid in the decision of the question, his sarcophagus was opened, when it is said the words "Pope and Martyr" were found inscribed on his body; but this supernatural testimony is in contradiction to the earlier authorities of the church.

FELIX III. (or II.) was descended from one of the most influential families of Rome, and succeeded Simplicius in the papal chair 2d March, 483. His first act was to repudiate the Henoticon, a deed of union, originating, it is supposed, with Acacius, patriarch of Constantinople, and published by the emperor Zeno with the view of allaying the strife between the Monophysites and their opponents in the Eastern church. He also addressed a letter of remonstrance to Acacius; but the latter proved refractory, and sentence of deposition was passed against him. As Acacius, however, had the support of the emperor, a schism (the first on record) arose between the Eastern and Western churches, which lasted for 34 years. Felix died in 492.

FELIX IV. (or III.), a native of Beneventum, was, on the death of John in 526, raised to the papal chair by the emperor Theodoric in opposition to the wishes of the clergy and people. His election was followed by serious riots, which were only quieted by the explanation of Theodoric that he had merely interposed his authority on account of the strifes of the ecclesiastical factions, and by his promise that in future the election should be vested in the clergy and people, although the confirmation of the emperor should also be required to render it valid. Felix, after an uneventful pontificate of four years, died in September, 530.

FELIX V. (or IV.). See AMADEUS VIII.

FELIX, of Urgel. See ADOPTIAN CONTROVERSY.

FELIX, of Valois (1127-1212), one of the founders of the monastic order of Trinitarians or Redemptionists, was born in the district of Valois, France, 19th April, 1127. Not long after he reached manhood he became a hermit in the forest of Galeresse, where he remained till his sixty-first year, when his disciple Jean de Matha suggested to him the idea of establishing an order of monks who should devote their lives to the redemption of Christian captives from the Mahometans. With this view they arrived at Rome about the end of 1197, and obtained the sanction of the pope for the establishment of the new order. On their return to France they founded the monastery of Cerfroi in Picardy, Felix remaining to govern and propagate the order, while Jean de Matha superintended the foreign journeys. A subordinate establishment was also founded by Felix in Paris near a chapel dedicated to St. Mathurin, on which account his monks were also called St. Mathurins. Felix died at Cerfroi, 4th November, 1212, and was canonized.

FELIX, ANTONIUS, a Roman procurator of Judæa, Sa-maria, Galilee, and Peræa, entered upon his office in the 11th or 12th year of the emperor Claudius. Both he and his brother Pallas were originally slaves, and, it is said, owed their freedom to Antonia, wife of the emperor, on which account it is probable that Felix received the surname Antonius. By some writers he is also called Claudius. Felix was cruel and licentious, and his accessibility to bribes led to a great increase of crime in Judæa under his government. The apostle Paul, after being apprehended in Jerusalem, was sent to be judged before Felix at Cæsarea, and so reasoned before him of righteousness, temperance, and judgment to come that Felix trembled. He nevertheless retained Paul in custody for two years, hoping that a bribe would be offered to secure his liberty, but at the end of this time Felix was succeeded in the government by Festus, and in order to gratify the Jewish people left Paul bound. On returning to Rome, Felix was accused of having taken advantage of a dispute between the Jews and Syrians of Cæsarea to slay and plunder the inhabitants, but through the intercession of his brother Pallas, who had great influence with the emperor Nero, he escaped unpunished.

FELIX, MINUCIUS. See MINUCIUS FELIX.

FELL, JOHN (1625–86), bishop of Oxford, was the son of Dr. Samuel Fell, dean of Christ Church, and was born at Longworth, in Berkshire, June 23, 1625. He passed from the free school of Thame to Christ Church College at the age of eleven, took his degree of B.A. in 1640, and three years later that of M.A. He served in the royal garrison of Oxford, and attained the rank of ensign. He afterwards took holy orders; and being ejected by the parliamentary visitors from his student's place, he lived in retirement at Oxford during the Commonwealth, privately keeping up the services of the Church of England, and administering the sacraments to many Royalists. At the Restoration he was made in rapid succession prebendary of Chichester, canon and dean of Christ Church. He had already obtained his degree of D.D., and was also chaplain to the king. In 1666 he was appointed vice-chancellor of the university, and he filled this post for several successive years. Dr. Fell set himself diligently to reform his college, to clear it of all remains of what he regarded as Puritan "hypocrisy and nonsense," to promote learning of all kinds, and to re-establish strict discipline. He did much for the improvement of the university press, therein carrying out the designs of Archbishop Laud. He zealously maintained the privileges of the university, and in so doing made himself unpopular with the townsmen. He also distinguished himself as a benefactor to the college by making and promoting many important additions to its buildings. Having shown himself a good scholar, and an earnest upholder of the Church of England, he was nominated in 1676 bishop of Oxford. He was allowed, however, still to hold his deanery of Christ Church *in commendam*. Fell, as a good Aristotelian, was alarmed at the institution and innovations of the Royal Society, and encouraged Stubbe to write against it, making very grave charges against its members. Among his numerous publications were a *Life of Dr. Henry Hammond* (1660), a Latin translation of Wood's *History and Antiquities of the University of Oxford* (1674), and a critical edition of the Greek Testament with many various readings (1675). This edition was twice reprinted at Leipsic, and at Oxford in 1703. It was followed in 1707 by the more important edition of Mill. When he had held the see of Oxford for ten years, Fell's health failed him, and anxiety about the changes attempted in the church by James II. hastened his end. He died at Oxford, July 10, 1686, and his remains were interred in the cathedral.

FELLATAHS, or FOULAHS. See AFRICA, vol. i. p. 235.

FELLENBERG, PHILIPP EMANUEL VON (1771–1844), educationist, was born 27th June, 1771, at Berne, in Switzerland. His father was of patrician family, and a man of importance in his canton, and his mother was a granddaughter of the Dutch admiral Van Tromp. From his mother and from Pfeffel, the blind poet of Colmar, he received a better education than falls to the lot of most boys, while the intimacy of his father with Pestalozzi gave to his mind that bent which it afterwards followed. In 1790 he entered the university of Tübingen, where he distinguished himself by his rapid progress in legal studies. On account of his health he afterwards undertook a walking tour in Switzerland and the adjoining portions of France, Swabia, and Tyrol, visiting the hamlets and farm-houses, mingling in the labors and occupations of the peasants and mechanics, and partaking of their rude fare and lodging. After the downfall of Robespierre he went to Paris and remained there long enough to be assured of the storm impending over his native country. This he did his best to avert, but his warnings were disregarded, and Switzerland was lost before any efficient means could be taken for its safety. Fellenberg, who had hastily raised a levy *en masse*, was proscribed; a price was set upon his head, and he was compelled to fly into Germany. Shortly afterwards, however, he was recalled by his countrymen, and sent on a mission to Paris to remonstrance against the rapacity and cruelty of the agents of the French republic. But in this and other diplomatic offices which he held for a short time, he was witness to so much corruption and intrigue that his mind revolted from the idea of a political life, and he returned home with the intention of devoting himself wholly to the education of the young. With this resolution he purchased in 1799 the estate of Hofwyl, near Bern, intending to make agriculture the basis of a new system which he had projected for elevating the lower and rightly training the higher orders of the state, and welding them together in a closer union than had hitherto been deemed attainable. For some time he carried on his labors in conjunction with Pestalozzi, but incompatibility of disposition soon induced them to separate. The scheme of Fellenberg at first excited a large amount of ridicule, but gradually it began to attract the notice of foreign countries; and pupils, some of them of the highest rank, began to flock to him from every country in Europe, both for the purpose of studying agriculture and to profit by the high moral training which he associated with his educational system. For forty-five years Fellenberg, assisted by his wife, continued his educational labors, and latterly raised his institution to the highest point of prosperity and usefulness. He died 21st November, 1844.

See Hamm, *Fellenberg's Leben und Wirken*, Bern, 1845; and Schöm, *Der Stifter von Hofwyl, Leben und Wirken Fellenberg's*.

FELLER, FRANÇOIS XAVIER DE (1735–1802), a Belgian author, was born at Brussels 18th August, 1735. In 1752 he entered a school of the Jesuits at Rheims, where he manifested a great aptitude for mathematics and physical science. He commenced his noviciate two years afterwards, and in testimony of his admiration for the apostle of India added Xavier to his surname. On the expiry of his noviciate he became professor at Luxembourg, and afterwards at Liége. In 1764 he was appointed to the professorship of theology at Tyrnau in Hungary, but in 1771 he returned to Belgium and continued to discharge his professorial duties at Liége till the suppression of the Jesuits in 1773. The remainder of his life he devoted to study, travel, and literature. On the invasion of Belgium by the French in 1794 he went to Paderborn, and remained there two years, after which he took up his residence at Ratisbon, where he died 23d May, 1802.

Feller's works exceed 120 volumes. In 1773 he published, under the assumed name Flexier de Reval (an anagram of Xavier de Feller), his *Catéchisme philosophique;* and his principal work, *Dictionnaire historique et littéraire* (published in 1781 at Liége in 8 volumes, and afterwards several times reprinted and continued down to 1848) appeared under the same name. Among his other works the most important are *Cours de morale chrétienne et de littérature réligieuse* and his *Coup d'œil sur congrès d'Ems*. The *Journal historique et littéraire*, published at Luxembourg and Liége from 1774 to 1794 in 70 volumes, was edited and in great part written by him.

FELLOWS, SIR CHARLES (1799–1860), a distinguished traveller and antiquary, was born in 1799 at Nottingham, where the family had held an ancestral estate for a considerable time. While only fourteen he drew sketches to illustrate a trip to the ruins of Newstead Abbey, which afterwards appeared on the title-page of Moore's *Life of Lord Byron*. In early youth he travelled through a great part of Britain, and in 1820 settled in London, where he proved an active member of the British Association for the advancement of science. In 1827 he distinguished himself as a traveller in Switzerland, and discovered the modern route to the top of Mont Blanc. After the death of his mother in 1832 he gave full scope to his natural bent, and passed the greater portion of each of the next ten years in Italy or Greece, or on the shores of the Levant. The numerous sketches he executed were largely used by Mr.

Murray in illustrating *Childe Harold.* In 1838 Fellows, induced by his passion for natural beauty and his preference of a simple peasant life to an artificial civilization, started for Asia Minor, where Smyrna was the centre of his travels. His explorations of parts of the interior and south led him to districts practically unknown to Europeans, and he thus discovered ruins of a number of ancient cities which existed earlier than 300 B.C. He entered Lycia and explored the Xanthus from the mouth at Patara upwards. Nine miles from Patara he discovered the ruins of Xanthus, the ancient capital of Lycia, finely situated on hills, and abounding in magnificent remains. About fifteen miles farther up he came upon the ruins of Tlos. After taking sketches of the most interesting objects, and copying a number of inscriptions, he returned to Smyrna through Caria and Lydia. Actuated by enlightened zeal, he soon brought his discoveries before European men of letters; and the publication of *A Journal written during an excursion in Asia Minor* (London, 1839) roused such strong interest in England that Lord Palmerston, at the request of the British Museum authorities, asked the English consul at Constantinople to get leave from the sultan to ship a number of the Lycian works of art. Late in 1839 Fellows, under the auspices of the British Museum, again set out for Lycia, accompanied by George Scharf, who assisted him materially in sketching. This second visit issued in the discovery of thirteen ancient cities, all enriched by works of art; and in 1841 appeared *An Account of Discoveries in Lycia, being a Journal kept during a Second Excursion in Asia Minor.* A third visit was made late in 1841, after Fellows had obtained the "firman" by personal application at Constantinople; and he and his party had the pleasure of pitching their tents under the town of Xanthus on the 30th of December. They shipped a number of works of art for England, and in the fourth and most famous expedition (1844) twenty-seven cases of marbles were dispatched for the British Museum, where they are now to be seen in the Lycian Saloon. The most noteworthy places on which the labors of Fellows cast a flood of light are Xanthus, Pinara, Patara, Tlos, Myra, and Olympus. The theatres in Lycian towns show the influence of the Greek drama among the so-called "barbarians;" and Lycian sculpture and architecture almost rival the Greek masterpieces. The arched tombs, one of which is in the British Museum, are compared by Fellows to Gothic architecture. These tombs are very common in Lycia. At Pinara, he says, "rises a singular round rocky cliff literally specked all over with tombs." For further information about Lycia compare with the works of Fellows Leake's *Asia Minor*, the *Travels in Lycia* of Spratt and Forbes, and *Description de l'Asie Mineure* by Texier. Papers on the Lycian language by Mr. Daniel Sharpe are appended to the works of Fellows. In 1844 Fellows presented to the British Museum his portfolios, accounts of his expeditions, and specimens of natural history illustrative of Lycia. In 1845 he received the order of knighthood "as an acknowledgment of his services in the removal of the Xanthian antiquities to this country." Fellows was twice married. He died in 1860.

In addition to the works above mentioned, Fellows published the following—*The Xanthian Marbles; their Acquisition and Transmission to England*, 1843; *An Account of the Ionic Trophy Monument excavated at Xanthus*, 1848; a cheap edition of his two *Journals*, entitled *Travels and Researches in Asia Minor, particularly in the Province of Lycia*, 1852; and *Coins of Ancient Lycia before the Reign of Alexander; with an Essay on the Relative Dates of the Lycian Monuments in the British Museum*, 1855.

FELO DE SE is one who commits murder upon himself. The technical conditions of murder apply to this crime; *e.g.*, "if one commits any unlawful malicious act, the consequence of which is his own death, as if attempting to kill another he runs upon his antagonist's sword, or shooting at another the gun bursts and kills himself," he is a *felo de se.* The horror inspired by this crime led to the revolting punishment of an "ignominious burial on the highway, with a stake driven through the body." This was abolished by 4 Geo. IV. c. 52, which ordered the burial of the body of a person found to be *felo de se* within 24 hours after the coroner's inquest, between the hours of 9 and 12 at night, and without Christian rites of sepulture. See SUICIDE.

FELONY. In English law crimes are divided into felonies and misdemeanors. The difference between them does not depend on their gravity as offences, nor on the amount of punishment attached to them,—it is purely historical. Felonies are those crimes which at common law brought with them after conviction forfeiture of goods. Since the Felony Act, noticed below, this is no longer an existing ground of distinction. Legal writers have sought to throw light on the nature of felony by examining the etymology of the word. One derivation suggested is from the Greek φῆλος, an impostor. Others connect it with the Latin verb *fallo.* Coke says it is *crimen animo felleo perpetratum* (a crime committed with malicious or evil intent). Spelman connects it with the word *fee*, signifying fief or feud; and felony in this way would be equivalent to *pretium feudi*, an act for which a man lost or gave up his fee (see Stephen's *Blackstone*, vol. iv. p. 7). And it appears that acts involving forfeiture were styled felonies in feudal law, although they had nothing of a criminal character about them. A breach of duty on the part of the vassal neglect of service, delay in seeking investiture, and the like were felonies. Injuries by the lord against the vassal were also felonies. In course of time felonies came to mean capital crimes, although there were a few felonies not punishable by death, and a few capital crimes which were not regarded as felonies. It became a principle of law that when a crime was declared by statute to be a felony, the punishment of death with forfeiture of land and goods necessarily attached (Blackstone's *Commentaries*, iv. 94). Blackstone accordingly makes felony include all capital crimes below treason. "Every person convicted of any felony for which no punishment is specially provided by the law in force for the time being is liable upon conviction thereof to be sentenced to penal servitude for any period not exceeding seven years, or to be imprisoned with or without hard labor and solitary confinement for any term not exceeding two years, and if a male to be once, twice, or thrice publicly or privately whipped in addition to such imprisonment" (Stephen's *Digest of the Criminal Law*, art. 18). The only practical distinction between felony and misdemeanor is that for the former arrests may be made by private persons acting without judicial authority. The Felony Act, 1870, abolished forfeitures for felony.

FELT is a fabric which results from the matting and intimate adhesion of fibrous materials among themselves, and is not, like ordinary cloth, produced by any spinning and weaving processes. All ordinary textile fibres possess sufficient adhesive tendency to enable them to be handled for spinning; but it is only in certain animal fibres that the peculiarity is so marked as to fit them for felting. The property results chiefly from the serrated or jagged structure of wool and hair, and efficient felting is also promoted by the crimped or wavy form which some fibres naturally assume. These properties are best developed in the short "carding" wool of such sheep as the merino and Saxony breeds, long "combing" wools possessing them in a less degree. Unwashed wool, being coated with the natural grease, does not felt. The hair of other animals, as of the rabbit, hare, coypu, vicugua, musquash, and ox, is employed for making felt of various kinds and for different purposes. Felt has been made and used from the most remote antiquity, and indeed, considering the simplicity of the material and the readiness with which wool felts, it is quite probable that it was known before woven fabrics. From time immemorial it has been employed for clothing and tent covers by the tribes of Central Asia, and to the present day it remains in extensive use among the Circassian, Armenian, and Tartar tribes. It is mentioned by Xenophon and Pliny, and Marco Polo describes its manufacture and applications in Central Asia. Felting results from combined pressure and moisture, and is favored by heat. Ordinary broad-cloth and all "fulled" woollen textures are partly felted, the fulling process having for its object a partial felting of the previously woven material; and the shrinking of woollen garments after washing, with which all are familiar, results from a felting by which the fibres draw closer together, the cloth gaining in thickness and solidity what it loses in superficial extent. The applications of felt are numerous, a certain range of qualities being used for clothing, domestic, and upholstery purposes, while other and generally rougher felts are employed for mechanical appliances. The manufacture of felt hats constitutes its most extensive application, for which see the article HAT. Its manufacture in the form of carpets, drugget, table-covers, and articles of clothing is also important and extensive. The felt for these purposes is made chiefly from wool, which is, after washing, first carded out into exceedingly fine uniform gossamer-like laps. These laps, of the length and breadth of the web to be made, are superimposed on each other in numbers corresponding to the thickness desired in the finished article. The superficial stratum is usually of finer texture than the body, and the mass when ready for felting has the appearance of a huge sheet of cotton wadding. In this state the compound lap is passed between a series of opposite pressing rollers partly immersed in water, some of which are solid and heavy and others hollow and heated internally by steam. In its progress the lap is not only squeezed between the rollers, but an oscillating motion being given to the upper series, it is at the same time submitted to a rubbing action, the result being that it issues a dense compact sheet of felt of uniform thickness. Felt so made is subsequently dyed, printed, and otherwise finished by the ordinary processes applicable to woven tissues. A patent has recently been secured for a carpet made of uniform strips of felt set on edge and tightly laced through the centre. Such a carpet is the same on both sides, and for it great durability, thickness, softness, and elasticity are claimed. Among the leading mechanical applications of felt may be enumerated the covering of steam boilers and cylinders, the lining of damp walls, steam-packing, non-conductors for kilns and refrigerators, filters, polishing wheels, lining between the planking and metal sheathing of ships, printers' blankets, and the covering of roofs. In the coarser qualities of felt cow-hair is the leading ingredient, and waterproof felting for roofs, etc., is impregnated with artificial asphalt and like substances. This manufacture was originally introduced by Croggon and Co. of London under a patent of Dr. Ritchie of Belfast; but the "roofing felt" now made is a misnomer, seeing it is a bituminous compound simply held together by waste flax and other vegetable fibres.

FELTHAM, Owen, a moral writer, whose essays were extremely popular during the 17th century. He is believed to have been the son of Thomas Feltham or Felltham of Mutford in Suffolk, and he was probably born about 1609. He was secretary to the earl of Thomond, under whose roof he wrote, when a youth of eighteen, a volume of one hundred *Resolves, Divine, Moral, and Political*, short and pithy essays, of which two editions saw the light in 1628. Of this book, which the author constantly augmented, eleven editions were printed before 1700 and several since. To later issues of the *Resolves* Feltham appended *Lusoria*, a collection of forty poems. Hardly anything is known of his life, except that Randolph addressed a poem of compliment to him, and became his friend, and that Feltham attacked Ben Jonson in an ode shortly before the aged poet's death, but contributed a flattering elegy to the *Jonsonus Virbius* in 1638. Early in life Feltham visited Flanders, and published his observations in 1652 under the title of *A Brief Character of the Low Countries.* He was a Royalist and a strict high-churchman. It is supposed that he died soon after 1677. Hallam, with excessive severity, has stigmatized Feltham as one of our worst writers. He has not, indeed, the elegance of Bacon, whom he emulated, and he is often obscure and affected after the fashion of his time; but his copious imagery and genuine penetration give his reflections a charm to those who have leisure to peruse them. To the middle classes of the 17th century he seemed a heaven-sent philosopher and guide, and was only less popular than Quarles the emblematist.

An edition published at London in 1806 contains an account of the life and writings of Feltham by James Cumming.

FELTRE, the ancient Feltria, a town of northern Italy, in the province of Belluno, and 16 miles S.W. of the town of that name. It stands on a hill at the foot of the Alps near the Piave, and is partially fortified. It possesses a beautiful town-hall with façades said to be by Palladio, a cathedral, numerous churches, an episcopal gymnasium, a diocesan school, and an orphan asylum. It has some trade in corn, wine, and oil, and manufactures of silk twist, wax, and leather. A money-lending establishment founded there in the 15th century still exists, and is said to be the oldest in Europe. Of the old castle, which was frequently besieged in the Venetian wars of the 14th and 15th centuries, little now remains but a square tower. The population of Feltre in 1871 was 4852, and including the suburbs 6570.

FELTRE, Morto da, a painter of the Venetian school, who worked at the close of the 15th century and beginning of the 16th. His real name appears to have been Pietro Luzzo; he is also known by the name Zarato or Zarotto, apparently from the place of his death: whether he was termed Morto (dead) from his joyless temperament is a disputed point. He may probably have studied painting first in Venice, but under what master is uncertain. At an early age he went to Rome, and investigated the ancient, especially the subterranean remains, and thence to Pozzuoli, where he painted from the decorations of antique crypts or "grotte." The style of fanciful arabesque which he formed for himself from these studies gained the name of "grottesche," whence comes "grotesque;" not, indeed, that Morto was the first painter of arabesque in the Italian Renaissance, for art of this kind had, apart from his influence, been fully developed, both in painting and in sculpture, towards 1480, but he may have powerfully aided its diffusion southwards. His works were received with much favor in Rome. He afterwards went to Florence, and painted some fine grotesques in the Palazzo Pubblico. Returning to Venice towards 1505, he assisted Giorgione in painting the Fondaco dei Tedeschi, and seems to have remained with him till 1511. If we may trust Ridolfi, Morto eloped with the mistress of Giorgione, whose grief at this transaction brought him to the grave; the allegation, however, is hardly reconcilable with other accounts. It may have been after 1511 that Morto returned to his native Feltre, then in a very ruinous condition from the ravages of war in 1509. There he executed various works, including some frescoes, still partly extant, and considered to be almost worthy of the hand of Raphael, in the loggia beside San Stefano. Towards the age of forty-five Morto, unquiet and dissatisfied, abandoned painting and took to soldiering in the service of the Venetian republic. He was made captain of a troop of two hundred men; and, fighting valorously, he died at Zara in Dalmatia, in 1519, or perhaps somewhat later. One of his pictures is in the Berlin Museum, an allegorical subject of Peace and War. Andrea di Cosimo was his pupil and assistant as a decorative painter.

FENCING is the proper use of a small-sword or foil. The small-sword is a light court-dress sword, made to taper gradually from the hilt to the point, and of a size regulated by the judgment of the wearer, if he understand the use of the weapon. The foil with which the art of fencing is practised is a small quadrangular blade, about the length of a small-sword, and mounted in nearly the same manner; but, for the convenience of the exercise, it is made lighter, blunted, and covered with leather at the point, to prevent accidents in practice.

The first weapon in use among mankind, whether for offensive or defensive purposes, appears to have been the sword. The most ancient records make frequent mention of it. The early swords were probably made of wood, like those used by the natives of Mexico when first visited by the Spaniards; but after the discovery of metals, bronze swords were introduced, of which kind many have at different times been found. As soon, however, as the art of tempering steel had been discovered, that metal superseded all other substances in the fabrication of arms; nor is it probable that any change in this respect will take place, or that any further improvement is attainable. The form of sword, however, has varied at different times and in different countries. Those used by the Roman legions were short and strong, with a blade seldom exceeding nineteen inches in length, but two-edged, and calculated both for the cut and the thrust. The British swords, called *spathæ*, were large, long, and heavy; and the Saxon and the Norman partook of the same character. The ancient practice of the weapon was probably carried to its greatest perfection amongst the Romans, whose partiality for gladiatorial exhibitions formed a remarkable feature of their character. The various and complicated methods of combat in which that people took delight are either alluded to or described by most of their writers, particularly by Livy, Juvenal, Seneca, and Suetonius.

The history of the modern small-sword or rapier is involved in some obscurity. The latter term, though now considered as synonymous with the former, probably denotes a long, ordinary, old-fashioned cutting sword. But by a rapier is now always meant a sword for the thrust, in contradistinction to one adapted for cutting. The small-sword or rapier is undoubtedly very ancient, although there is reason to believe that it was not brought into general use until armor for protecting the body began to go out of fashion. Since that time the art of fencing has always been considered as a gentlemanly accomplishment, and in many parts of the Continent it is cultivated with the greatest zeal and assiduity. Some have maintained that the weapon was not used in England before the reign of Elizabeth; and Darcie (*Annals of Elizabeth*) informs us that one Rowland York, who appears to have betrayed Deventer to the Spaniards in the year 1587, was the first who brought into England "that wicked, pernicious fashion to fight in the fields in duels with a rapier called a tucke only for the thrust." Stowe also mentions that long tucks and long rapiers began about the twelfth or thirteenth year of Elizabeth, and that "he was held the greatest gallant that had the deepest ruffe and largest rapier. The offence," he adds, "to the eye of the one, and the hurt unto the life of the subject that came by the other, caused her Majesty to make proclamation against them both, and to place selected grave citizens at every gate to cut the ruffes and break the rapiers' points of all passengers that exceeded a yard in length of their rapiers, and a nayle of a yard in depth of their ruffes." [1]

But at whatever time the small-sword came into use in this country, it is not surprising that, when once introduced, it should have been cultivated as the most equitable instrument of duelling. Before this period meetings for the purpose of single combat were utterly revolting to all notions of fairness. No regard was paid to equality of arms or numbers; advantages, however unfair, were seized whenever an opportunity offered; and the ferocious passions, instead of being curbed, had fuller scope given for their gratification. "The duellist of former times," says Sir Walter Scott, in a note to *The Lady of the Lake*, "did not always stand upon those punctilios respecting equality of arms which are now judged essential to fair combat. It is true that in formal combats in the lists, parties were, by the judges of the field, put as nearly as possible in the same circumstances. But in private duels it was often otherwise." The practice of deciding duels with the sword may be considered as now extinct in England. When the rapier was looked upon as an indispensable part of a gentleman's dress, the facility of immediate rencounter which it offered gave occasion to frequent and dangerous brawls, by which the public tranquillity was disturbed, and the lives of peaceable citizens sometimes sacrificed. Since arms have ceased to be worn, such an objection can no longer be urged against the art of defence; and it may perhaps be questioned whether it ever had much weight.

The practice of the foil is here considered as applied to the most laudable purposes, namely, the enjoyment of salutary recreation and the acquisition of a graceful and unconstrained deportment. The beneficial effects of moderate fencing to persons of weak constitutions, or of studious and sedentary habits, have been attested by medical practitioners of the first eminence. To the public speaker, the practice of the fencing-room has been found to impart an ease and freedom of gesture attainable by no other exercise. For while the use of the foil and the broadsword diffuses ease, elegance, and grace all over the body, and imparts to the look and gesture an appearance of intellectual vigor, it teaches invaluable lessons of patience and self-command, and contributes to discipline the temper. "Perhaps there is no exercise whatever," says Mr. Roland (*Theory and Practice of Fencing*), "more calculated for these purposes (developing and cultivating bodily strength and activity) than fencing. Riding, walking, sparring, wrestling, running, and pitching the bar are all of them certainly highly beneficial; but, beyond all question, there is no single exercise which combines so many advantages as fencing. By it the muscles of every part of the body are brought into play; it expands the chest, and occasions an equal distribution of the blood and other circulating fluids through the whole system. More than one case has fallen under the author's own observation, in which affections of the lungs, and a tendency to consumption, have been entirely removed by occasional practice with the foil."

We now proceed to give such definitions as appear to be requisite for conveying a general idea of the science of fencing, referring the reader for the necessary details to the numerous manuals published on the subject.

Attacks and Parades.—After the first positions have been acquired, the modes of attack come to be considered. Attacks are made in three ways:—first, by a quick thrust proceeding merely from the wrist, the arm at the same time being elevated and advanced, with the point directed towards the adversary's breast; secondly, by what is technically called an extension; and lastly, by longeing and recovering. The parades, in which consists the defensive part of the art, naturally follow the attack. A parade is a defence of the body, made by an opposition of one's blade to that of an adversary, in such a situation as upon his attack to prevent the point of his sword hitting. The parades are eight in number, viz., six simple, called *quarte, tierce, circle, octave, prime, quinte*, and two round or counter parades in quarte and tierce.

Thrusts, etc.—The next division of the subject includes straight thrusts, simple disengagements, and bindings of the blade. A *straight thrust* is used as an attack, when an antagonist, from his position on guard, leaves sufficient opening to enable him to be touched upon that side of the body on which blades are joined. When such an opportunity offers, the wrist must be suddenly raised, so as to bring the "forte" of one's sword to the "foible" of the adversary's; after which longe immediately on the same line to his breast, observing, however, to preserve a correct opposition. In fencing, "opposition" signifies the art of covering the body at the time of delivering a thrust, on that side where the foils happen to cross, in order to prevent an antagonist exchanging hits. The *disengagement* is made either as an attack, or as a return after defending one's self from a thrust, and is executed both under and over the wrist or foils. A disengagement over the arm may be parried with tierce or prime, and, if made low, by the parade of circle; from the position of octave by quarte, or, if the thrust be delivered low, by circle; from the position of quinte by prime as the readiest defence, but quarte and tierce are also correct parades against this thrust. There are three different ways of *binding the blade.* Of these, "flanconnade" is the principal, as it is sometimes a safe attack when any other mode would be attended with considerable danger; it is also made as a "riposte." The attack of flanconnade is commenced when the blades are joined in quarte, and it is parried either by octave or quinte, or by the parade of quarte. The return over the arm, after the parade of circle, is parried by prime or tierce, or by changing quickly to the counter in quarte. The return over the arm, after the parade of prime, is parried by prime or tierce, or, if made at a considerable distance, by the counter in quarte.

Feints.—In fencing there are a great variety of feints, which it is not easy to describe intelligibly without figures. A feint is an intentional movement made to deceive an adversary. All thrusts, therefore, may, strictly speaking, come under the definition of feints, as the fencer's object, in all his attacks, is to deceive his antagonist. For the sake of convenience, however, straight thrusts and simple disengagements have been arranged under a separate head. In executing the feint called *one two*, inside of the arm, supposing the adversary's body to be covered in quarte, the parade of tierce is deceived; commencing from the outside, that of quarte is deceived; from the position of the circle the octave, and from that of the octave the circle is deceived. This feint, if made inside the arm, is parried by the parade of quarte, or by the counter in tierce, made upon an opponent's second disengagement; upon the outside of the arm, by tierce, prime, or the counter in quarte; and from the position of the octave, by octave or quinte. The feint *one two* is likewise made as a return after the parade of quarte or tierce, or sometimes after that of circle or octave. The *cut and disengage* is a species of *one two*, in making which from the position of quarte an adversary's parade of tierce is deceived, and from the position of tierce his parade of quarte. *Cut and disengage*, if made inside of the arm, is parried by quarte, or the counter in tierce; if outside, by tierce or counter in quarte. *Feint seconde* is another feint very nearly resembling *one two*, and is generally made as a return after the parades of tierce, prime, or quinte. In this feint the octave or quinte is deceived; and it is parried by tierce, prime, or quarte, the two former being the readiest where quinte is the parade deceived, but if the feint has been answered with octave, the thrust must then be parried with quarte. The feint *one two three* is made on either side of the blade, upon precisely the same principles as *one two*,—the only difference between them consisting in making one disengagement more in the latter than in the former movement. The *cut and one two* is a species of *one two three.* These feints, if made over the arm, are parried with the simple parade of tierce; if on the inside, with simple quarte. The other feints are—*doubling,* which, *mutatis mutandis,* is executed upon precisely the same principles; *one two and deceive the circle,* executed from the inside position of quarte; *one two and deceive the counter,* which may be made from either side of the blade, but most frequently commences from the position of tierce; *feint flanconnade,* which can be commenced only from the engagement of quarte; *feint seconde and deceive quarte,* which is always commenced from the outside engagement, whether made as an attack or a return; *feint seconde and deceive tierce,* which differs from the preceding only in the last disengagement; *one two and deceive quarte from the position of the circle,* when the first disengagement is made over the adversary's wrist towards the body under the arm, and the second over the wrist towards the inside of the body; and *doubling on both sides of the arm,* which is too complicated a feint to be frequently used in actual fencing, because it is difficult to follow the adversary's sword with certainty through many different parades, and there is much danger of "time thrusts" upon feints which consist of so many disengagements.

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[1] In *The Two Angry Women of Abingdon*, a comedy printed in 1599, we find the following pathetic complaint: "Sword and buckler fights begin to grow out of use. I am sorry for it; I shall never see good manhood again. If it be once gone, this poking fight of rapier and dagger will come up; then a tall man, and a good sword-and-buckler man, will be spitted like a cat or a rabbit."

Time thrusts are so called because the success of these movements depends entirely upon their being executed at the exact moment of time employed by the adversary in planning or in executing his attack; and, when made correctly, they are by far the most scientific movements in fencing. There are two sort of time thrusts, in the execution of one of which it is necessary that the blades should cross each other, but for the completion of the other it is not absolutely necessary that the blades should even meet. Those time thrusts in the execution of which the blades cross are more scientific, and expose the fencer less to exchanged hits. There are two time thrusts *in opposition*—one the *time over the arm,* and the other the *time in octave.* The former is applicable to all thrusts, however simple or complex the feint may be, provided the longe is made upon the outside; whereas all longes directed to the inside of the body, or under the arm, are exposed to the time in octave; and thus almost every thrust made in fencing affords an opportunity for one or other of these two movements. Those time thrusts in which the opposition is not essential are made upon incorrect movements of the adversary, when he exposes himself by the wideness of his attacks, or by quitting the blade in a dangerous position, or by making too many disengagements in his feints, or by giving a variety of openings which the judgment of the fencer must determine how he is to take advantage of. This thrust is practised almost entirely upon irregular attacks, and requires great caution to be observed. It has been already stated that time thrusts in opposition, when correctly made upon good attacks, are perhaps the finest movements in fencing; but young fencers should nevertheless attempt them very seldom, from the danger of misjudging the attack, and thus exposing themselves to the certainty of being hit. And the time out of opposition is attended with still greater hazard, as its success depends rather upon the wideness and irregularity of an adversary's movements than on the security of one's own situation afforded by the opposition in the former species of time thrust.

When fencing was comparatively little known, it was thought necessary that there should be some intermediate practice for the pupil between the lesson of the master and his making the assault; for which purpose, it appears, he was taught to longe, at a proper distance, at the wall. This was called by the French *tirer au mur,* and was considered as useful for planting the learner well upon his legs, accustoming him to measure distance correctly, and causing his motions, in making his extension and longe, to follow one another in the proper succession. But as the art became better understood, observation induced masters to place pupils together for their mutual advantage, the one to attack by simple disengagements, the other to parry by quarte and tierce alternately; and this practice, from its origin, was long called *tirer au mur.* It is now, however, generally known as *quarte and tierce,* and, in its improved state, is not merely intended as an exercise for the scholar, but also as a graceful display of the principal motions of fencing; for which reason it should be invariably practised before commencing the assault, and in fencing before company it is never dispensed with. Quarte and tierce appears very simple in its execution, yet it is exceedingly useful to fencers in all stages of their progress, and difficult to acquire with such correctness that all its movements shall take place in their proper succession, and be made with the grace and precision characteristic of a good fencer. The *counters* is also a practice of importance to young fencers.

In the language of the fencing-room, making the *assault* and *playing loose* are synonymous, signifying the practice of attack and defence, or, in other words, a just application of the lessons received, which, in fact, ought to be done as correctly as if with sword in hand. In the assault, the mere movements should be almost mechanical; for the mind being wholly employed in discovering and counteracting the designs of the adversary, as well as in concealing its own, the hand should, on the proper opportunity being given, instantly execute that which the mind conceives without any consideration of the manner in which the particular motion is to be made.

The rules to be observed are few and distinct. The first thing which the attention of a young fencer should naturally be directed to is the most secure manner in which he can come into the position of the guard, when opposed to an adversary ready to take every advantage of his inexperience. Whilst advancing into distance, it is also an object of importance to have one side of the body secured by the position, particularly that side to which the antagonist's blade is opposed; so that, if he commence an attack during this movement, he must quit the blade in order to direct his thrust or feint at any opening afforded him by the position of his opponent; and the opportunities of attack being few, his designs will thus be the more easily discovered. In short, the commanding an opponent's blade almost obliges him to effect some change in the relative situations of the contending parties, before he advances into distance; and as the necessity of such previous movement must be foreseen, any attempt of this kind is favorable for making an attack on him. And, generally, whilst standing in the position of the guard, it is an advantage to have one side of the body covered, and to command the foible of the adversary's blade. Straight thrusts and simple disengagements, executed with quickness and vigor, should frequently be attempted, even though they do not succeed in hitting; and this should be particularly attended to in fencing with a stranger. Quick simple thrusts are almost the only certain way of ascertaining his favorite parades, and consequently of knowing by what feints to attack him with a probability of success. The suddenness and rapidity of the attack will inevitably extort from him the secret of his favorite defence.

Many masters of the old school, and some, too, of the present day, have treated *disarming* as of importance in the art; but from its inutility, not to mention danger, in the field, it is now considered incompatible with good fencing, and indeed no better than a trick. The only advantage of disarming is that of annoying the person disarmed; for, sword in hand, it is rendered nugatory by the use of a sword-knot, with which, it may be presumed, every person at all acquainted with the weapon will take especial care to fasten it to his wrist in a seriou affair. As the manœuvre may therefore be defeated by the most ordinary precaution, attempting it can serve no other purpose than to cause heavy and unpleasant play; whilst the strength it requires for its execution is a drawback, and affords an adversary favorable moments of attack during the time an attempt is being made to bind his blade.

As far back as 1692 a very curious book on the subject of fencing was published by Sir William Hope; it is now very scarce. In 1780 a Lieutenant M'Arthur published a work on fencing, which he dedicated to the duke of Argyll. Several modern works of merit have appeared on this subject; one of the most valuable and complete is Roland's *Treatise on the Theory and Practice of the Art of Fencing.*

FÉNELON, BERTRAND DE SALIGNAC (?—1589), Marquis de La Mothe, a French diplomatist who was ambassador to England during the reign of Elizabeth. At the request of Charles IX. he endeavored to excuse to Elizabeth the massacre of St. Bartholomew as a necessity caused by a plot which had been laid against the life of the king of France. For some time after the death of Charles IX. Fénelon was continued in his office, but he was recalled in 1575 when Catherine de' Medici wished to bring about a marriage between Elizabeth and the duke of Alençon, and thought that another ambassador would have a better chance of success in the negotiation. In 1582 Fénelon again arrived in England, charged with a private commission from the king of France, chiefly with the view of obtaining the liberation of Mary queen of Scots on the promise of a French alliance; but Elizabeth saw reason to doubt the king's sincerity, and Fénelon had to leave England without gaining his purpose. He died in 1589.

Fénelon is the author of a number of writings, among which those of general importance are *Mémoires touchant l'Angleterre et la Suisse, ou Sommaire de la négociation faite en Angleterre, l'an 1575* (containing a number of the letters of Charles and his mother, relating to Queen Elizabeth, Queen Mary, and the Bartholomew massacre), published in the *Mémoires* of Castelnau, Paris, 1659; *Négociations de La Mothe Fénelon et de Michel, sieur de Mauvissière, en Angleterre;* and *Dépêches de M. de La Mothe Fénelon, Instructions au sieur de La Mauvissière*, both contained in the edition of Castelnau's *Mémoires*, published at Brussels in 1731. The correspondence of Fénelon was published at Paris in 1838–41, in 7 vols. 8vo.

FÉNELON, François de Salignac de Lamothe (1651–1715), archbishop of Cambray, and one of the most celebrated names in the intellectual and ecclesiastical history of France in the 17th century, was born at the Château de Fénelon in Périgord, August 6, 1651. The family of Salignac or Salagnac, to which he belonged, had been ennobled from the middle of the 15th century, and produced already many distinguished names. The father of the future archbishop was Count Pons de Salignac, of whose second marriage, contracted in mature years, François was the only child. From his birth he was of a delicate and sensitive temperament; and, greatly beloved by his old father, he was educated at home till he was twelve years of age. He received, according to one of his biographers, "a simple Christian education devoid of anything remarkable." But he must have been lucky in his tutor or of rare aptitude for learning, for he seems then to have laid the foundation of his admirable scholarship and love of letters. After a short time at the college of Cahors, he went to Paris to complete his studies under the Jesuits at the Collége du Plessis. There his great gifts soon drew to him distinction, and, like his rival Bossuet, he ventured to preach to an admiring audience at the age of fifteen. His father seems to have died before this time, and his uncle, the Marquis de Fénelon, who had assumed the care of his education, withdrew his charge from what might have proved injurious seductions, and placed him in the seminary of St. Sulpice under the saintly Trouson. His uncle was himself a remarkable man. Distinguished as a soldier and a statesman, he became no less distinguished for his piety and moral heroism. In conjunction with M. Olier, the founder of St. Sulpice, he inaugurated and became the first president of an association for the suppression of duelling. The association was composed only of men whose valor was unimpeachable, and whose oath binding them to refuse any challenge or take part in any duel could not therefore be mistaken. The Marquis de Fénelon and his daughter, who became Madame de Montmorenci Laval, wife of the Marquis de Montmorenci Laval, both exercised a decisive and happy influence over the young Fénelon. Many of his early letters are addressed to his cousin, whom he looked upon as a sister—the only one he had ever known. But the head of St. Sulpice, M. Trouson, shared with these relatives the task of his higher education, and no one, both now and afterwards, enjoyed so much of his confidence. "Great as is my freedom and openheartedness with you," the young student writes to his uncle after being placed at the seminary, "I must confess without any fear of making you jealous that I am still more unreserved with M. Trouson; if you could hear our conversation and the ease with which I lay bare my heart to him, and with which he teaches me to know God, you would not know your pupil, and you would see that God has very marvellously helped on the work which you began."

Fénelon's first aspirations were towards a missionary life. The congregation at St. Sulpice had established a missionary society at Canada which many of its pupils had joined, and he wished to follow their steps; and when this project failed he still more earnestly desired to undertake a mission to Greece. In one of his letters, dated October 9, 1675, he draws a glowing sketch of his desire to visit "the glorious scenes," redolent of the spirit of antiquity, which he had so often pictured in imagination, and "to seek out the Areopagus whence St. Paul proclaimed the unknown God to heathen sages." But his delicate health, and the dissuasion of another uncle, the bishop of Sarlat, interfered with his missionary longings. He was induced to remain at home and accept the office of superior of the community of Nouvelles Catholiques, a community founded for the protection and instruction of women converted from Protestantism. He spent ten years (1675–85) of quiet and successful labor in connection with this institution, became intimately associated with a select circle, at the head of which was the Duc de Beauvilliers, began his career as an author, and otherwise laid the foundation of his remarkable influence. It was at the request of the Duchesse de Beauvilliers that he is said to have written his first work, *De l'Education des Filles*, which long maintained its reputation among the higher families of France, and may still be consulted with advantage. It contains many admirable precepts. To this same period belong a *Refutation of Malebranche's Treatise of Nature and Grace*, in which he was assisted with marginal notes by Bossuet, and a treatise on the *Ministry of Pastors*, in which he set forth the blessing of a divine order appointed in uninterrupted succession from the apostles to guard men from error, seeing that all experience proves how unable ordinary men are "to decide for themselves as to the details of dogmas." This treatise had a polemical aim against the Protestants, but was at the same time written with great moderation and fairness.

In 1685 Louis XIV. carried out his infamous policy of expelling the Protestants from France by the revocation of the edict of Nantes. Great disturbance arose in consequence in the districts of Poitou and Saintonge. It was necessary, by firm yet gentle means, to do something to allay the violent irritation which had been caused. On the recommendation of Bossuet, Fénelon was chosen as the head of a mission for this purpose. He made two conditions,—that all troops should be withdrawn from the provinces, and that he should be allowed to choose his fellow workers. The result was that his mission was attended with considerable success, although he himself complains more than a year afterwards, "Our converts get on very slowly;—it is no easy matter to change the opinions of a whole people." On his return to Paris he had several interviews with the king to report the result of his labors, and afterwards resumed in comparative privacy his old duties among the Nouvelles Catholiques. M. de Harlay, the well-known brilliant but profligate archbishop of Paris, who had first advanced him to this position, withdrew his favor from him when he saw he could make no use of him. "It seems, M. l'Abbé, that you wish to be forgotten, and you shall be," was his bitter speech on one occasion; and he so far succeeded as to prevent Fénelon's appointment to the see of Poiters which had been contemplated by the king.

Suddenly he was called to the responsible position of preceptor of the dauphin's son, the young duke of Burgundy. This was the work especially of his friend the Duc de Beauvilliers, who in 1689 was appointed governor of the royal grandson. But other friends warmly rejoiced in Fénelon's advancement, and amongst these Bossuet wrote to Madame de Montmorenci Laval congratulating her. "We shall not lose the Abbé Fénelon," he says; "you will be able to enjoy him, and, provincial as I am, I shall escape from time to time to embrace him." It is interesting to notice this renewed trace of hearty friendship between these two illustrious men, considering the unhappy relations which afterwards arose between them.

No man probably was ever better fitted than Fénelon for the difficult position which he now assumed, and to which he mainly devoted himself during the next six years (1689–95). He was a born teacher in the highest sense,—gifted with the most charming qualities of patience, sweetness of temper, tact, and address, yet inflexible in principle, and severe and unbending in his methods of training. He had the manners of a *grand seigneur*, with all the intellectual refinements of an accomplished churchman. Saint Simon in his *Mémoires* (t. xxii. p. 135) has left a portrait of him about this time which has been often quoted, and from which we extract only a few sentences. "He was a tall thin man, well made, pale, with a large nose, eyes whence fire and talent streamed like a torrent, and a physiognomy the like of which I have never seen in any other man, and which once seen one could never forget. It combined everything, and the greatest contradictions produced no want of harmony. It united seriousness and gayety, gravity and courtesy—the prevailing characteristic, as in everything about him, being refinement, intellect, gracefulness, modesty, and above all *noblesse.* It was difficult to take one's eyes off him. All his portraits are speaking, and yet none of them have caught the exquisite harmony which struck one in the original, or the exceeding delicacy of every feature. His manner altogether corresponded to his appearance; his perfect ease was infectious to others, and his conversation was stamped with the grace and good taste which are only acquired by habitual intercourse with the best society and the great world." He had need of all his brilliant and solid qualities in the task which he had undertaken. The young duke of Burgundy, as the same writer remarks, "was born with a *naturel* which made one tremble. He was so passionate that he would break the clocks which summoned him to some unwelcome duty, and fly into the wildest rage with the rain which hindered some pleasure." He was withal warm-hearted and clever,—in fact, "dangerously quick in penetrating both things and people." Fénelon had full scope for the exercise of his marvellous educational art, and the result was a success far beyond what is usual in such cases. The impetuous but affectionate and bright child grew under his charge into an earnest, well-disciplined, and promising, if somewhat over-scrupulous and timid youth, whose life if spared might have brought blessing to France. Fénelon carefully planned all the details of his education, and has embodied in his well-known *Télémaque* and other writings the principles on which he based it. It was his aim to train the young prince not merely in habits of self-control, to direct his scholarly acquirements and religious convictions, but, moreover, to awaken in him true and large political instincts fitted to qualify him for his high position. Fénelon himself, while an aristocrat both by birth and feeling, and strongly favorable to the maintenance of these class distinctions, which were especially marked in France in the 17th century, was at the same time essentially liberal in his recognition of the radical equality of all men, and the moral regards which should regulate the relation of classes to one another. His ideal was that of a limited monarchy, surrounded by national institutions, each having its due place and function in the body politic, and representing in due degree public opinion. A written constitution, one sovereign law for all, universal education provided by the State, the reciprocal independence of the temporal and spiritual powers, detestation of war, free industry in agriculture and trade, a people growing in intelligence and self-dependence round the throne and under the guidance of the church,—such were the broad principles which he sought to instil into his pupil, and so to make him, in his own language, "a philosophic king," "a new Saint Louis." The task was a noble one, and it was pursued with all the fascination, patience, and quiet earnestness which distinguished him.

But a train of circumstances was preparing, destined to impair and finally to overthrow his influence at court, and to banish him from all intercourse with his royal pupil. We can only very briefly indicate the causes which led to this result. A system of religious mysticism known as Quietism had been set afloat towards the end of the 17th century by a Spanish priest of the name of Molinos. The system was espoused in France amongst others especially by Madame Guyon, a remarkable woman devoted to the cause of religion, but of an erratic and restless temperament. Her writings on the subject attracted wide attention, and speedily called forth ecclesiastical condemnation. The archbishop of Paris took up a position of violent hostility towards her; the severe and methodical character of the king was greatly offended by her excesses; and Bossuet was by and by drawn into the circle of her vehement opponents. Strangely it was by Fénelon's advice that the subject was first brought under Bossuet's notice. Attracted by Madame Guyon's genuine enthusiasm, and no doubt finding something in her view of disinterested mysticism which appealed to his own religious temperament, he recommended her to place her writings in the hands of the bishop of Meaux, and to abide by his decision. Many conferences were held on the subject, in which Fénelon at first took no part, and during the progress of which he held friendly communication with his old friend, and in fact supplied Bossuet, who professed his ignorance of the mystical writers, with extracts from the fathers and others bearing on the controversy. The relation of the two friends continued apparently cordial; the atmosphere of the court had not yet changed towards him, for it was at this very time, in the beginning of 1695, that the king nominated Fénelon for the archbishopric of Cambray; but gradually out of this miserable business there sprung up a host of embittered feelings. After his appointment as archbishop, Fénelon had joined in the conferences at Issy which finally condemned Madame Guyon's doctrines. He scrupled, however, to subscribe her condemnation; he scrupled also to express approval of a publication of Bossuet attacking these doctrines; and in vindication of his own position and principles he published his *Maximes des Saints sur la vie intérieure.* The result was to kindle into greater fury the storm of controversy, to provoke the jealous and violent animosity of Bossuet, and to fan the suspicions with which the king had always more or less regarded him into such a vehement outbreak as to lead to his permanent banishment from court, and his condemnation at Rome (1699). He submitted himself to the pontifical decision. But this did not save him either from the continued anger of Bossuet or from the displeasure of the monarch, which were further excited by the publication, through the treachery of a secretary, of his *Télémaque,* under the allegorical disguise of which Louis and his courtiers recognized a satire against the absolutist principles of the French Government.

Fénelon himself disclaimed any such intention. "He had," he said, "introduced all the virtues necessary for a good government, and the faults to which sovereign power is liable, but none were drawn with the slightest approach to any personality or portraiture. The more the book is examined, the more it will be seen that it only expressed principles fully, without attempting to draw any finished character. My only object was to amuse the duke of Burgundy with a tale of adventure, and to instruct him at the same time, without ever thinking of giving the work to the public" (*Corresp.,* t. iii. p. 247).

The remainder of Fénelon's life was spent in his diocese in ceaseless works of Christian piety and charity. Cambray abounded in Protestants and Jansenists, whom he greatly won by his toleration and evangelical simplicity. It was, moreover, a great thoroughfare for the armies of the time, to the necessities of which, and especially of the sick and wounded, he personally ministered. His own palace was sometimes crowded with invalided officers, who remained his guests for months. He became in consequence endeared to the army and the people. Mingling familiarly with the poorest peasants under his spiritual charge, dispensing with liberality, yet without ostentation, the duties of Christian hospitality, carrying on an extensive correspondence with the clergy and some of his old friends at court, he became more honored in his retirement even than he had been in Paris. "In everything," says Saint Simon, "he was a true bishop, in everything a *grand seigneur,* in everything, too, the author of *Télémaque.*" A curious picture is preserved of these later years of Fénelon by a Scotchman of the name of Andrew Ramsay, who had wandered over Holland and Germany in search of something more satisfying than the sectarianism of his native country, or the deism which seemed to him for a time the only alternative. Won by the spiritual beauty of Fénelon's character, and the elevation of his teaching, he embraced the Catholic faith, spent much of his time at Cambray, and wrote the first life ever published of his teacher and friend. The last years of the good archbishop's life were saddened by the loss of most of his friends. "Our best friends," he said, on hearing of the death of the Duc de Beauvilliers in 1714, "are the source of our greatest sorrow and bitterness." And again he wrote to a remaining friend, "I only live in friendship now, and friendship will be the cause of my death." He died on the 17th January, 1715.

Fénelon is chiefly remembered for the beauty of his character, his tender and mystic devotion, and the charm of his style as a writer. He is not great as a thinker, nor can the substance of his writings be said to have a permanent value. But there is the same subtle delicacy, sensibility, and tenderness and purity of expression in his style as in his character. An exquisite highly-toned and noble genius pervades the one and the other. As a man he is one of the greatest figures in a great time. As a writer he has been placed in prose on the same level with Racine in poetry. In both there is the same full harmony and clearness, the same combination of natural grace with perfect art.

In addition to the works of Fénelon already noticed, the following deserve to be mentioned:—The *Dialogues des Morts, composés pour l'Éducation d'un Prince*, 1712; *Dialogues sur l'Éloquence*, etc., 1718; *Lettres sur divers sujets concernant la religion et la métaphysique*, 1718; *Traité de l'Existence de Dieu*, etc., 1713. There are many collected editions of his works. That of Leclerc (Paris, 1827–30), 38 small vols., is the latest. An excellent life of Fénelon has recently appeared in English (1877) by the same author as the *Life of Bossuet* mentioned under that article. (J. T.)

FENIANS. Ireland appears to have been the theatre of a great ethnic struggle in the first century of the Christian era, in which certain tribes, known to the Romans as Scots, reduced the other inhabitants to subjection. The servile clans are called in Irish story *Aithech Tuatha*, rent-paying tribes, though one of them settled near the river Liffey is specially mentioned as the *Tuath Aithechta*, a name believed to have been the origin of the Latinized tribe-name *Atticotti*. According to Irish tradition Scotic power appears to have been fully established in the reign of a king called *Tuathal*, the Legitimate, who was slain about 160 A.D. Between this prehistoric king's reign and the mission of St. Patrick, an interval of about 300 years, was the period of the invasions of Roman Britain by the Picts and Scots, which, though not strictly within the historic period of Irish history, touches upon it so closely that many traditions of the time have come down to us intermingled with a rich and increasing growth of legend embodied in verse and prose tales, known to the Irish speaking peasantry as *Sgeulta fiannuigheachta*, stories of the *Fians* or Fennians. The word *Fianna* is glossed in an Irish MS, by *feinneda*, champions, that is, of the king of *Eire*. Instead of *Fian, Fianna*, we have also the words in the oblique case *feinn, feinne*, from whence has come the English form Fenian. The stories are sometimes also called Ossianic, from a corrupt form of the name of a Fenian poet and warrior named *Oísin*, the Ossian of Macpherson; but though properly applicable to poems, the term cannot be applied to prose tales.

According to popular tradition the *Fians*, or Fenians, were mercenary tribes acting as a permanent military force for the support of the *Ard Rig*, or king of *Eire*. They are supposed to have been instituted by a prehistoric king, *Fiachadh*, the father of the above-named *Tuathal*, or his brother according to another account, and to have enjoyed great power for about 150 years, until, some of them having taken part with the king of Leinster against the king of *Eire*, they nearly annihilated each other in the battle of Gabhra, which is perhaps only another way of saying that the king, jealous of their power, broke up the organization. The term *Fian* continued, however, to be sometimes applied by the poets to the *Amos*, or mercenary troops, which the provincial kings, as well as the king of *Eire*, kept about them. In later times poets even used it in the general sense of soldiers, hence the use of such expressions as "*Fians* of *Alba*," "*Fians* of *Breatan*," etc. As the Irish princes had an opportunity of learning something of the Roman military system in Britain,—Tacitus (*Agr.*, xxiv.) mentions that one was in the camp of Agricola,—there is nothing improbable in the Scotic or Milesian kings imitating it so far as to assign constant military duty to certain clans. One of the glosses on the word *Fianna* explains it as *fineadha*, because it was in *Fines*, septs, they were formed. The Leinster and Meath Fenians, consisting of the *Clanna Baiscné*, from a stemfather *Bascné*, are said to have been Damnonians of the subjugated tribes of the *Gaileoin* settled in Meath and East Leinster, one of which was the *Tuath Aithechta* above mentioned. The *Gaileoins* figure in the *Táin bo Cuailnge*, a celebrated tale of the older or Heroic cycle of Irish romance, as the Leinster contingent of *Ailill*, the husband of Queen *Medb*, the heroine of the tale. The Connaught Fenians, the *Clanna Morna*, so called from a stemfather *Morn*, were also a servile tribe, the *Tuath Domnann*, settled in Erris in the west of Mayo. *Ferdiad* son of *Daman*, whose combat with *Cúchulaind* forms the finest episode of the *Táin bo Cuailnge*, was of this tribe. The *Clanna Degaid*, or Munster Fenians, were also probably one of the subjugated tribes. *Curoi* son of *Dare*, a celebrated hero of the older or Heroic period, seems to have been of this race. It is worthy of note that Ulster, whose warriors of the *Craebh Ruaid* or Red Branch are the most prominent figures in the Heroic period, had no Fenians. The genealogists of later times, desirous of making every warrior, poet, and saint a Milesian, provided elaborate Milesian pedigrees for the *Clanna Baiscné*, to which belonged the chief hero of the Fenian period, *Deime*, surnamed *Finn*, or *Find*, son of *Cumall* son of *Trenmor; Find's* sons *Oísin* and *Fergus Finnbheoil*, *Oscar* son of *Oísin*, *Caoilté* son of *Ronan*, and many others. His great rival *Aedh* called *Goll* (the one-eyed) *Mac Morna*, *Conan Mac Morna* grandson of *Goll*, and the other warriors of the *Clanna Morna* or Connaught Fenians, continued to be regarded as Firbolgs.

The Irish MSS. contain no account of the organization or distribution of the Fenians, except what can be gathered from incidental references; but Dr. Keating, who appears to have had access to many MSS. since lost, and who may be trusted to tell only what he found in them, gives in his *History of Ireland* a curious legendary account to which the reader is referred. It was this account which suggested calling the members of an organization that was formed a few years ago among the Irish in the United States of America for promoting and assisting revolutionary movements in Ireland, and which attained much notoriety, Fenians (see IRELAND). The founder of the modern Fenians, John O'Mahony, was also the author of a translation of Keating's *History*, which he published in New York in the year 1857.

Conn of the Hundred Battles, *Art* the son of *Conn*, *Cormac* son of *Art*, and *Cairbre* son of *Cormac*, the chief kings of the Fenian period, *Find* son of *Cumall*, and his son *Oísin*, and some others of the chief heroes, are doubtless real personages. But even in the oldest manuscripts they are so mixed up with mythological beings that it is impossible to sift fact from fiction. Thus in the *Leabhar na h-Uidhri*, the oldest existing MS. written wholly in Irish, some time before the year 1106, there is a story concerning a certain king *Mongan* the subject of many legends, who is supposed to have flourished at the end of the sixth and beginning of the seventh century, which makes him out to be no other than the celebrated *Find* son of *Cumall* himself. The Fenian stories are merely Celtic myths in a new dress, clothing a few misty forms of real life, about whom we know almost nothing. As has been stated in the article CELTIC LITERATURE, the personages of the Heroic period, *Cúchulaind*, *Fergus* son of *Rog*, *Conal Cernach*, *Laegaire Buadach*, *Catbad* the Druid, Queen *Medb*, *Ferdiad* son of *Daman*, etc., are never associated in any genuine tale with those of the Fennian or Fenian period, such as *Find* son of *Cumall*, *Oísin*, *Oscar*, *Diarmait*, *Caoilté Mac Ronain*, *Goll Mac Morna*, etc.

The recitation of Fennian stories in the halls of kings and chieftains, and in popular assemblies by the *Fili*, was usual in the 12th century, as we learn from a poem on the triennial *Aonech*, or fair of Carman, now Wexford, in the Book of Leinster, a manuscript of that time. This manuscript also contains poems attributed to *Find* himself, and to his son *Oísin*, and most of the poems and prose tales coming under the head Fennian, or Fenian, and now or recently current among the Irish-speaking peasantry, are also to be found in MSS. at least 300 years old.

As might be expected from the common origin of the Irish and Gaelic population of Scotland, and the close intellectual association between them for centuries, owing to the literary language of both being the same, and to the additional circumstance that the Irish poets, harpers, and leeches looked upon Celtic Scotland quite as much within their domain as any part of Ireland, Fennian poems and tales were as well known in the former as in the latter. The written stories when old are in the literary language, that is Irish, and do not differ from those found in similar MSS. in Ireland. The current stories are of course in the Gaelic dialect of Scotland, which has gradually supplanted Irish as the literary language since the literary separation of Ireland and Scotland, caused by the Reformation and the decay of the Irish language in Ireland itself. It was such stories, written in the literary language or Irish, and others still current among the Gaelic-speaking population of the Highlands, that suggested to James Macpherson the subjects of his poems of Ossian, and supplied him with a considerable part of the materials. In using these materials he mingled the events and the actors of the two perfectly distinct periods of story, that of *Cúchulaind*, or the Heroic period, and that of *Find*, or the Fennian period. Macpherson was not, however, the first who was guilty of this anachronism; in the Book of the Dean of Lismore, transcribed in the first half of the 16th century, there is a sort of mosaic poem made up apparently of fragments of totally different stories belonging to both periods, and having lines interpolated to link the fragments.[1] It is a rude example of what Macpherson did so well 200 years after. The first part appears to be a fragment of a version of the *Seirgligi Conculaind*, or Sick Bed of *Cúchulaind*, into which are introduced references to the *Fians;* then follows a fragment concerning the death of *Conlaech*, son of *Cúchulaind;* this is followed by a fragment about the battle of *Cnuca*, in which *Cumall*, son of *Trenmor* and father of *Find*, was slain by *Goll* son of *Morn*.

Bibliography.—Keating's *History of Ireland*, John O'Mahony's translation, New York, 1857; O'Curry's *Lectures on the MS. Materials of Irish History*, and on the *Manners and Customs of the Ancient Irish*, and his *Battle of Magh Leana*, published by the Celtic Society; the *Dean of Lismore's Book;* J. F. Campbell of Islay's *Leabhar na Feinne*, and his *Popular Tales of the West Highlands; Transactions of the Ossianiac Society.* See also Bibliography of CELTIC LITERATURE, vol. v. p. 283.

(W. K. S.)

FENNEL (*Fœniculum*), a genus of umbelliferous plants, having umbels compound and without involucres; petals yellow, entire, roundish, and incurved at the tip; and fruit a laterally compressed cremocarp, with achene 5-ridged, a large, single vitta under each furrow, and albumen plano-convex. (See BOTANY, vol. iv. p. 136, fig. 292; and p. 137, fig. 299.) Common Fennel, *F. vulgare*, Gärtn. (*Anethum Fœniculum*, L.), to which the other forms of fennel are generally referred, is a perennial from 2 to 3 or, when cultivated, 4 feet in height, having leaves three or four times pinnate, with numerous linear or awl-shaped segments, and umbels glaucous, and of about 15 or 20 rays. The plant appears to be of South European origin, but is now met with in various parts of Britain and the rest of temperate Europe, and in the west of Asia. The fruits have an aromatic taste and odor, and are used for the preparation of oil of fennel and fennel water, valued for their stimulant and carminative properties. The fruits and edible shoots of fennel were eaten by the ancient Romans. The fennel seeds of commerce are of several sorts. Sweet or Roman Fennel seeds are the produce of a tall perennial plant, with umbels of 25–30 rays, which is cultivated near Nismes in the south of France; they are elliptical and arched in form, about $\frac{2}{5}$ inch long and a quarter as broad, and are smooth externally, and of a color approaching a pale green. Shorter and straighter fruits are obtained from the annual variety of *F. vulgare* known as *F. Panmorium* (*Panmuhuri*) or Indian Fennel, and are employed in India in curries and for medicinal purposes. Other kinds are the German or Saxon fruits, brownish-green in color, and between $\frac{1}{5}$ and $\frac{1}{4}$ inch in length, and the broader but smaller fruits of the Wild or Bitter Fennel of the south of France. A variety of fennel, *F. dulce*, having the stem compressed at the base, and the umbel 6–8 rayed, is grown in kitchen-gardens for the sake of its leaves. Giant Fennel is the name applied to the plant *Ferula communis*, common in Sicily, where the pith of the stem is used as tinder. Hog's or Sow Fennel is the species *Peucedanum officinale*.

FENTON, ELIJAH (1683–1730), an English poet, was born at Shelton, near Newcastle-under-Lyme, Staffordshire, 20th May, 1683. He entered Jesus College, Cambridge, with the view of studying for the church, but afterwards declined to take orders, and on leaving the university he accompanied the earl of Orrery to Flanders in the capacity of private secretary. On the return of the earl to England in 1705, Fenton became assistant in a school at Headley in Surrey, and was soon afterwards appointed master of the free grammar-school at Sevenoaks in Kent. In 1710 he was induced by the promise of a political appointment from Lord Bolingbroke to resign his mastership, but a change in the Government led to the disappointment of his hopes. He was, however, not long afterwards appointed tutor to Lord Broghill, only son of the earl of Orrery; and when this engagement expired, he was, on the recommendation of Pope, employed to give private literary instructions to Mr. Craggs, secretary of state. His next engagement was with Pope himself, whom he assisted in translating the *Odyssey*. The first, fourth, nineteenth, and twentieth books are ascribed to Fenton. In 1717 he published a volume of *Miscellaneous Poems*, and in 1723 his tragedy of *Marianne* was brought out, and was performed with such success that the author's profits are said to have amounted to nearly a thousand pounds. The poetical merit of this tragedy is considerable; but the diction is too figurative and ornate for a dramatic composition, and accordingly it has not retained its place on the stage. In 1727 Fenton superintended a new edition of Milton's *Poems*, to which he prefixed a life, and in 1729 he published a splendid edition of Waller, with notes. During the latter part of his life he was employed by Lady Trumbull, first as tutor to her son, and afterwards as auditor of her accounts. He died at East Hampstead, Berkshire, on the 13th of July, 1730, and was interred in the parish church, where his tomb has inscribed on it an epitaph written by Pope.

See Johnson's *Lives of the Poets;* Boyle's edition of Pope; and *The Gentleman's Magazine*, lxi., lxiv.

FENTON, SIR GEOFFREY, a writer and statesman during the reigns of Elizabeth and James I., the brother of Edward Fenton the navigator, who accompanied Sir Martin Frobisher in his expeditions, and was afterwards sent out independently to endeavor to discover a north-west passage. In the capacity of queen's counsellor Sir Geoffrey served for twenty-seven years in Ireland, where his conduct appears to have given great satisfaction to his royal mistress, notwithstanding that he took every opportunity of impressing on her mind the strong conviction he entertained that the safety and glory of her government in that island depended on her subjects enjoying the protection of equal laws. He died at Dublin October 19, 1606.

Fenton is best known for his translation of the *History of the Wars of Italy* by Guicciardini, which he dedicated to Elizabeth. Of his other translations the principal are *Certain Tragical Discourses written out of French and Latin*, 1567, and *Golden Epistles, containing a variety of discourses, both Moral, Philosophical, and Divine, gathered as well out of the remainder of Guevara's works as other authors, Latin, French, and Italian*, 1577. The *Familiar Epistles* of Guevara had been published in English by Edward Fellowes in 1574; Fenton's collection consists of pieces not contained in that publication.

FENUGREEK (*Trigonella*), a genus of leguminous herbs very similar in habit and in most of their characters to the species of the genus *Medicago*. The leaves are formed of three obovate leaflets, the middle one of which is stalked; the flowers are solitary or in clusters of two or three, and have a campanulate, 5-cleft calyx; and the pods are many-seeded, cylindrical or flattened, and straight or only slightly curved. The fenugreeks or trigonels are widely diffused over the south of Europe, West and Central Asia, and the north of Africa, and are represented also by several species in Australia. Common Fenugreek, *T. Fœnum-græcum*, so called from the name given to it by the ancients, who used it as fodder for cattle, is indigenous to the Mediterranean region, and is cultivated to some extent in Thuringia, Moravia, and other parts of Europe, and in Morocco, and largely in Egypt and in India. It bears a sickle-shaped pod, containing from 10 to 20 seeds, from which 6 per cent. of a fetid, fatty, and bitter oil can be extracted by ether. In India the fresh plant is employed as an esculent. The seed is an ingredient in curry powders, and is used for flavoring cattle foods. It was formerly much esteemed as a medicine, and is still in repute in veterinary practice.

FEOFFMENT, in English law, was the form of granting or conveying a freehold or fee. One of its essential elements was *livery of seisin* (delivery of possession), which consisted in formally giving to the feoffee on the land a clod or turf, or a growing twig, as a symbol of the transfer of the land. This was called livery *in deed*. Livery *in law* was made not on but in sight of this land, the feoffer saying to the feoffee, "I give you that land; enter and take possession." By the 8 and 9 Vict. c. 106 feoffments were rendered unnecessary and superfluous. All corporeal hereditaments were by that Act declared to be *in grant* as well as *livery*, *i. e.*, they could be granted by deed without livery. And feoffments were in general required to be evidenced by deed.

FERDINAND. The name of Ferdinand (the Italian *Ferdinando* or *Ferrante*, Spanish *Fernando* or *Hernando*, Arabian *Ferdeland*), which is supposed to be of Gothic origin and to be allied to the German *verdienend* (meritorious), has been borne by a considerable number of European sovereigns, the more important of whom are noticed below in the following order—first, the emperors, and then the kings of Naples, Portugal, and Spain, the grand-dukes of Tuscany, and the duke of Brunswick.

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[1] *The Dean of Lismore's Book*, ed. by Rev. T. M'Lauchlan and W. F. Skene, Edinburgh, 1862, p. 88 (translation), 64 (text).

FERDINAND I. (1503–1564), emperor, was the son of Philip of Austria and Joanna daughter of Ferdinand and Isabella of Spain, and was born at Alcala in Spain 10th March, 1503. In 1521 he married princess Anna of Hungary, and on the death in 1526 of her only brother the boy-king Louis of Bohemia and Hungary he was elected king of Bohemia, but in Hungary his claims were opposed by John Zapolya, palatine of Transylvania. Zapolya suffered a severe defeat from the imperial troops near Tokay; but after receiving the aid of the Turks he managed to carry on the struggle with varying success until 1538, when the exhausted resources of both rival parties led to a compromise, by which it was agreed that a half of the kingdom should be assigned to each, and that on the death of John the half over which he ruled should revert to Ferdinand. But on the death of John in 1540 the Turks supported the cause of his infant son John Sigismund, and in 1547 Ferdinand was compelled to purchase peace at the price of a yearly tribute. The war was again renewed in 1552, and at its termination the Turks were allowed to retain possession of a part of Hungary in trust for Sigismund. In 1521 Ferdinand had been chosen president of the council of regency appointed to govern Germany during the absence in Spain of his brother the emperor Charles V., and in 1531 he was, through the influence of his brother, elected king of the Romans, in which capacity he acted the part of mediator between the emperor and the German princes, and in 1552 negotiated a treaty between him and the elector Maurice of Saxony. On the abdication of Charles in 1556 Ferdinand was elected emperor. Pope Paul IV. refused ecclesiastical recognition to the election on the ground that it was made without the consent of the papal see, but happily Paul died before the dispute had time to lead to serious consequences, and his successor Pius IV. avoided an open rupture by recognizing its validity on condition that Ferdinand should not observe the treaty of Augsburg. Ferdinand during his short reign showed himself an able, just, and enlightened ruler. He reorganized the aulic council, effected a reform in the monetary system of Germany, and exerted himself to bring about a reconciliation between his Protestant and Roman Catholic subjects. To effect this he endeavored on the one hand to obtain from the pope various concessions to the Protestants, among others permission for the laity to use the cup at the communion, and liberty of marriage for the priests; and on the other hand he sought to persuade the Protestants to send deputies to the council of Trent; but his death, 25th July, 1564, prevented these negotiations having a satisfactory termination. See Bucholtz, *Geschichte der Regierung Ferdinands I.*, 9 vols., Vienna, 1831–38.

FERDINAND II. (1578–1637), emperor, was the grandson of the preceding and the son of Charles duke of Styria and of Mary of Bavaria, and was born at Gratz, 9th July, 1578. He was educated by the Jesuits, and having imbibed strong anti-Protestant sentiments is said to have taken a solemn vow before the altar that, on receiving the imperial crown, promised him by his cousin Matthias II., he would at whatever cost re-establish the Roman Catholic religion throughout all his states. In 1618 Matthias abdicated the thrones of Bohemia and Hungary in his favor, and on the death of Matthias in 1619 he laid claim to the imperial crown. His keen Roman Catholic sympathies, allied to a character gloomy, fanatical, and cruel, had already led him to disregard the guarantees of toleration by which his election to the thrones of Bohemia and Hungary had been acceded to; and on that account the Bohemians, shortly after the death of Matthias, rose in revolt, and under the leadership of Count Thurn besieged him in Vienna, until the arrival of an army under General Bouquoi forced them to retreat, and enabled him to proceed to Frankfort to receive the imperial crown. The Bohemians, notwithstanding their defeat, chose as their king the elector-palatine Frederick V., son of James I. of Scotland, and with the assistance of Bethlen Gabor, prince of Transylvania, who revolted against Ferdinand in Hungary, virtually inaugurated the long struggle for religious liberty known as the Thirty Years' War. Ferdinand, however, with the support of the Catholic league and the alliance of John George I., elector of Saxony, was able completely to subdue them after a short campaign, and having totally defeated them near Prague, November 8, 1620, he deprived them of their constitutional rights, banished the leading Protestant families, expelled the Reformed preachers and recalled the Jesuits, and by cruel persecutions totally quelled every manifestation of Protestant belief. But in Hungary he was not so successful as to enable him to put such extreme measures into execution; on the contrary, he thought it prudent to conclude a peace on the 31st of December, 1621, by which he agreed to cede one half of the country to Bethlen Gabor, and to grant religious toleration to the other half. In Germany fortune was for a time more favorable to the Roman Catholic cause; several of the German princes had entered into a league with Christian IV. of Denmark, but that monarch was defeated by Ferdinand's general, Wallenstein, and a peace between him and Ferdinand was concluded in 1629. Taking advantage of his opportunity, Ferdinand in the same year passed the famous Edict of Restitution, which enforced the restoration of all German ecclesiastical property that had passed into other hands since the treaty of Passau in 1552. The full execution of the edict was, however, prevented,—partly by the unwillingness of the Roman Catholic princes to give up the property of which they had become possessed, partly by the intrigues of Cardinal Richelieu, who was jealous of the increasing influence of the emperor, but principally through the arrival of Gustavus Adolphus. Uniting with the Protestant princes of Germany, Gustavus inflicted a succession of defeats on Ferdinand, who, having at the urgent representations of the Catholic princes dismissed Wallenstein from the command of the imperial army, possessed no general at all adequate to cope with the genius and energy of the king of Sweden. Gustavus was subsequently joined by the elector of Saxony, and fortune failed to smile on the arms of Ferdinand, even after the recall of Wallenstein, who was defeated at the battle of Lützen, 16th November, 1632. The victory was dearly bought by the death of the king of Sweden, but Wallenstein took little advantage of the great loss thus sustained by the Protestant cause; and the emperor, learning that he finally meditated treachery, caused him to be assassinated, February 25, 1634. In the same year the imperial army was successful at the battle of Nordlingen, and after this victory the elector of Saxony separated himself from the Swedish alliance and made peace with Ferdinand; but the Swedes continuing the struggle with great determination, and being afterwards joined by France, Ferdinand, when he died on the 15th February, 1637, was uncomforted by the hope of any near fulfilment of the purpose expressed in his oath, and attempted by such ruthless persecutions and at such an expense of treasure and of human life.

See Khevenhüller, *Annales Ferdinandi II.*; the various histories of the Thirty Years' War; Ranke, *Die Röm. Päpste,* vol. ii.; and Hurter, *Geschichte Ferdinands II.* This last is written from a Roman Catholic standpoint.

FERDINAND III. (1608–1657), emperor, the son of the preceding, was born at Gratz, 11th July, 1608. He became king of Bohemia in 1625, king of Hungary in 1627, king of the Romans in 1636, and succeeded his father as emperor in 1637. Milder in disposition, less fanatical in his opinions, and somewhat dispirited on account of the repeated defeats inflicted on the German arms by Duke Bernhard and General Baner, he was at an early period of his reign strongly desirous of obtaining peace even at the cost of liberal concessions to the Protestants; but the determination of France and Sweden to humiliate the imperial power prevented negotiations being entered into until 1643. Between that date and 1648 fruitless conferences continued to be held, the war meanwhile raging intermittently and with somewhat spent fury. In 1647, however, Ferdinand had guaranteed religious toleration to Hungary, and finally, on October 24, 1648, the Peace of Westphalia was signed, by which was brought to a close a war that, besides the evils inflicted by it on other countries, had desolated the whole of Germany, paralyzed its trade, and destroyed more than half its population. By this treaty religious liberty was secured to Germany, although not to Bohemia; France obtained part of Alsace and Lorraine, and the son of Frederick V. got the Upper

Palatinate; while Sweden obtained Western Pomerania, and became a member of the German diet. The unity of Germany was at the same time so broken up by concessions granted to the independent princes that with the death of Ferdinand III. the German kingdom may be said to have ceased to exist, until re-established by William I. after the Franco-Prussian war. During the peace negotiations of Westphalia, Ferdinand IV., eldest son of Ferdinand III., was chosen king of the Romans, but he died in 1654. Ferdinand III. died, April 2, 1657, shortly after concluding a treaty with the Poles against Sweden. See Koch, *Geschichte des Deutschen Reichs unter Ferdinand III.*, 1865.

FERDINAND I. (1793-1875), emperor of Austria, the eldest son of the emperor Francis I. by his second wife Maria Theresa, daughter of Charles VI., was born in Vienna, April 19, 1793. He inherited a constitution so weak as to unfit him for the duties of his station, but his amiable and benevolent disposition secured him general respect, and acquired for him the surname of the Good. On the 2d February, 1831, he married Princess Anne Caroline, third daughter of Victor Emmanuel of Sardinia, but the marriage was without issue. He was crowned nominal sovereign of Hungary under the title of Ferdinand V. in 1830, succeeded his father as emperor of Austria on the 2d March, 1835, and received the crown of Bohemia in 1836, and that of Lombardy in 1839. During his whole reign the government of Austria was virtually in the hands of Prince Metternich, who continued the conservative policy of Francis I. The revolution of the 13th March, 1848, compelled Metternich to resign office, and, the constitution not meeting with the approval of the revolutionists, Ferdinand fled to Innsbruck. At the urgent request of all parties, he shortly afterwards returned to Vienna, but on a renewal of the outbreak he left the capital for Olmütz in Moravia, where, feeling himself unfit to cope with the difficulties of government, he was persuaded to abdicate in favor of his nephew, Francis Joseph, 2d December, 1848. He spent the remainder of his life in retirement, chiefly at Prague in Bohemia, where he died 29th June, 1875.

FERDINAND I. (1423–1494), king of Naples, the illegitimate son of Alphonso V. of Aragon and I. of Sicily and Naples, was born in 1423. In accordance with his father's will, he succeeded him on the throne of Naples in 1458, but Pope Calixtus III. having refused to recognize him, John of Anjou, desirous to turn to advantage the opportunity of regaining the throne of his ancestors, invaded the country, and inflicted on him a severe defeat, July 7, 1460. Ferdinand fled to Naples accompanied by only twenty cavaliers, but having by certain concessions obtained recognition from Pius II., who about this time succeeded Calixtus on the papal throne, he received through him the aid of the Albanian chief Scanderbeg, and defeated John of Anjou at Troja with great loss, August 18, 1462. In 1480 the Turks captured Otranto from Ferdinand, and massacred the majority of the inhabitants, but in the following year it was retaken. The only other event of importance during his reign was an abortive attempt at revolt on the part of the nobles in 1485, many of whom, notwithstanding that he promised them a general amnesty, were afterwards treacherously murdered by his commands. On account of his refusing to pay to Innocent VIII. the census-tax promised by him to Pius II., he was in 1489 excommunicated, but he subsequently gained the favor of Alexander VI. He died 25th January, 1494, while Charles VIII. of France was preparing to invade his dominions. Though cruel in the infliction of punishment, and ready without scruple to break his promises when it suited him, Ferdinand generally dealt out to his subjects even-handed justice, favored the spread of knowledge, and greatly increased the industrial and commercial prosperity of his kingdom.

FERDINAND II., king of Naples, grandson of the preceding, and son of Alphonso II., was born probably in 1468. Alphonso, finding his tenure of the throne uncertain on account of the general dissatisfaction of his subjects, abdicated in his son's favor in 1495, but notwithstanding this the treason of a party in Naples rendered it impossible to defend the city against the approach of Charles VIII. Ferdinand fled to Ischia; but when the French left Naples, the Neapolitans, irritated by their conduct during the occupation of the city, recalled him; and with the aid of the great general of Ferdinand V. of Spain, Gonzalo de Cordova, he was able completely to rid his state of its invaders shortly before his death on the 7th October, 1496.

FERDINAND III. of Naples. See FERDINAND V. of Spain.

FERDINAND IV. (1751–1825) of Naples, III. of Sicily, and I. of the Two Sicilies, third son of Don Carlos, king of Naples (afterwards Charles III. of Spain), was born in Naples, January 12, 1751. When his father ascended the Spanish throne in 1759, Ferdinand, in accordance with the treaties which forbade the union of the two crowns, succeeded him on the throne of Naples, under a regency of which Bernardo Tanucci was the chief. On account of the ambitious purposes of Tanucci, who wished to retain the government of the kingdom as much as possible in his own hands, the education of the young king was very much neglected, while no restraint was put upon his love of pleasure, or his excessive preference for athletic exercises and outdoor sports. His minority ended on the 12th January, 1767, and in 1768 he married Maria Caroline, daughter of the empress Maria Theresa. According to the marriage contract the queen after the birth of her first son was to have a voice in the councils of state; and she was not backward to make use of this opportunity of political influence. Beautiful, clever, and ambitious, and inheriting many of the masculine characteristics of her mother, she soon ousted Tanucci both from the favor of the king and from all but nominal authority in the state; and when he systematically attempted to frustrate her purposes, he was finally in 1777 dismissed from his office. The Englishman Sir John Acton was shortly after this appointed admiral of the Neapolitan fleet, and succeeded so completely in winning the favor of both queen and court, that he was speedily promoted to be minister of war, and then of foreign affairs. Under his influence Spain lost her ascendency in Neapolitan politics, and an intimate connection was formed with Austria and England. In 1793 Ferdinand joined the coalition against France, and although he made peace with France in 1796, he took advantage of the absence of Napoleon in Egypt to renew the war in 1798. His army occupied Rome for a short time, but after the defeat of some of its divisions by the French, Ferdinand, without attempting to defend Naples, to which he had fled panic-stricken, escaped on board the English fleet under Admiral Nelson, and went to Palermo; and the French, entering the city after a furious but undisciplined resistence by the lazzaroni, established with the aid of the citizens and nobles the "Parthenopean Republic." When, six weeks after this, the defeat of their arms in the north of Italy compelled the French to abandon Naples, Ferdinand was restored by a Calabrian army under Cardinal Ruffo; and with the connivance of Admiral Nelson a reign of terror was inaugurated, which continued until the success of the French arms in 1801 induced Ferdinand to sign a treaty whereby, besides other concessions, he promised to grant an amnesty to political offenders, and also agreed to permit French troops to occupy his territories. But when war broke out between France and Austria in 1805, he thought the opportunity favorable for throwing off the French domination, and prompted by Caroline permitted 13,000 Russian and English troops to land at Naples. Scarcely had he done so, when the victory of Austerlitz enabled Napoleon to despatch an army against him. Ferdinand with his usual precipitation fled from his capital, leaving Caroline to negotiate terms with the enemy, but as Napoleon refused all further compromise with the house of Bourbon she was compelled to follow her husband into Sicily. On March 30, 1806, Joseph Bonaparte was proclaimed king of Naples and Sicily; but Ferdinand with the aid of England continued to reign over the latter kingdom. After the dethronement in 1815 of Murat, who had succeeded Joseph Bonaparte as king of Naples in 1808, Ferdinand was recalled to his capital, and on December 12, 1816, he united his two states into one, and assumed the title of king of the Two Sicilies. As a condition of his recall he had sworn to grant a constitution, but no sooner did he find himself secure from external interference than he abolished it; and although a revolution compelled him again in 1820 to give to it a nominal assent, he was shortly afterwards able, with the help of an Austrian army, to break his promises with impunity, and by means of an elaborate system of espionage and the unscrupulous arrest and punishment of all suspected persons to re-establish his despotism in a more vigorous form than ever. He died 4th. January, 1825.

See Botta, *Storia d'Italia dal 1789 al 1814*; Coletta, *Storia del reame di Napoli dal 1734 sino al 1825*, 2 vols., 1834, English translation, 1858; *Sketch of Popular Tumults*, 1837; and *Mémoires du Général Pepe*, 1847.

FERDINAND II. (1810–1859), king of the Two Sicilies, grandson of the preceding, and son of Francis I., was born at Palermo, January 12, 1810. On succeeding his father in 1830, he published an edict in which he promised to "give his most anxious attention to the impartial administration of justice," to reform the finances, and to "use every effort to heal the wounds which had afflicted the kingdom for so many years;" but these promises seem to have been meant only to lull discontent to sleep, for while the existing burden of taxation was only slightly lightened, corruption began gradually to invade all departments of the administration, and an absolutism was finally established harsher than that of all his predecessors, and supported by even more extensive and arbitrary arrests. Ferdinand was naturally shrewd, but badly educated, grossly superstitious, and possessed of inordinate self-esteem. Though he kept the machinery of his kingdom in a high state of efficiency, he made little account of the wishes or welfare of his subjects, and did not deem it of much importance to be on good terms either with them or with foreign states. In 1832 he married Christina, daughter of Victor Emmanuel, and shortly after her death in 1836 he took for a second wife Maria Theresa, daughter of Archduke Charles of Austria. After his Austrian alliance the bonds of despotism were more closely tightened, and the increasing discontent of his subjects was manifested by abortive attempts at insurrection in 1837, 1841, 1844, and 1847, and in 1848 by a general rising in Sicily, on account of which the king judged it prudent to promise a constitution. A dispute, however, arose as to the nature of the oath which should be taken by the members of the chamber of deputies, and as neither the king nor the deputies would yield, serious disturbances began to occur in the streets of Naples; and the king, making these the excuse for withdrawing his promise, on the 13th March, 1849, dissolved the national parliament. The efforts at revolt were renewed in Sicily, but were speedily quelled, chiefly by the bombardment of the principal cities of the state, an expedient which won for Ferdinand the epithet of "Bomba." During the last years of his reign espionage and arbitrary arrests prevented all serious manifestations of insubordination among his subjects. In 1851 the political prisoners of Naples were calculated by Mr. Gladstone to number 13,000, and so great was the scandal created by the rule of terror which prevailed that in 1856 France and England, though vainly, made diplomatic representations to induce a mitigation of its rigor and the proclamation of a general amnesty. An attempt was made to assassinate Ferdinand in 1857. He died May 22, 1859.

See *Correspondence respecting the Affairs of Naples and Sicily, 1848–49, presented to both Houses of Parliament by command of Her Majesty*, 4th May, 1849; *Two Letters to the Earl of Aberdeen*, by the Right Hon. W. E. Gladstone, 1st ed. 1851 (an edition published in 1852, and the subsequent editions, contain an *Examination of the Official Reply of the Neapolitan Government*); supplementary chapter to the English translation of Coletta's *History of Naples*; and Dawburn, *Naples and King Ferdinand*, 1858.

FERDINAND I. of Portugal (1345–1383), sometimes referred to as *el Gentil* (the Gentleman), son of Pedro I. of Portugal (who is not to be confounded with his Castilian contemporary Pedro the Cruel), succeeded his father in 1367. On the death of Pedro of Castile in 1369, Ferdinand, as great-grandson of Sancho IV. by the female line, laid claim to the vacant throne, for which the kings of Aragon and Navarre, and afterwards the duke of Lancaster (married in 1370 to Constance, the eldest daughter of Pedro), also became competitors. Meanwhile Henry of Trastamara, the brother (illegitimate) and conqueror of Pedro, had assumed the crown and taken the field. After one or two indecisive campaigns, all parties were ready to accept the mediation of Pope Gregory XI. The conditions of the treaty, ratified in 1371, included a marriage between Ferdinand and Leonora of Castile. But before the union could take place the former had suddenly become passionately attached to Leonora Tellez, the wife of one of his own courtiers, and having procured a dissolution of her previous marriage, he lost no time in making her his queen. This strange conduct, although it raised a serious insurrection in Portugal, did not at once result in a war with Henry; but the outward concord was soon disturbed by the intrigues of the duke of Lancaster, who prevailed on Ferdinand to enter into a secret treaty for the expulsion of Henry from his throne. The war which followed was unsuccessful; and peace was again made in 1373. On the death of Henry in 1379, the duke of Lancaster once more put forward his claims, and again found an ally in Portugal; but, according to the Continental annalists, the English proved as offensive to their companions in arms as to their enemies in the field; and Ferdinand made a peace for himself at Badajoz in 1382, it being stipulated that Beatrix, the heiress of Ferdinand, should marry King John of Castile, and thus secure the ultimate union of the crowns. On the death of Ferdinand at Lisbon in the following year (22d October, 1383), leaving no male issue, the direct Burgundian line, which had been in possession of the throne since the days of Count Henry (about 1112,) became extinct. The stipulations of the treaty of Badajoz were set aside, and John, grand-master of the order of Aviz, Ferdinand's illegitimate brother, was proclaimed. This led to a war which lasted for several years.

FERDINAND I. of Aragon and Sicily (1379–1416), surnamed the Just, the younger son of John I. of Castile and Leonora of Aragon, was born in 1379. On the death of his elder brother Henry III. in 1406, he refused the crown of Castile which the nobles had offered, but in accordance with his brother's will undertook the office of regent during the minority of his nephew John II. In this capacity he distinguished himself by his prudent administration of home affairs, and by his victories over the Moors by land and sea. He took the title *de Antequera* on the surrender of that fortress after a siege of five months (1410). On the death of his maternal uncle, King Martin of Aragon and Sicily, his claims to the throne, though not derived from the usual laws of descent, were taken up and keenly pressed by a powerful party in the state. The question of the succession was ultimately referred to a committee of nine judges equally representing Catalonia, Valencia, and Aragon; and the result was his election by a majority (1412). After he had defeated, at Balaguer, Count Jayme of Urgel, the last and most formidable of his rivals, he was formally crowned at Saragossa in 1414.

From the year 1378 Europe had been scandalized by the spectacle of the papal schism; and since 1410 three rival popes had been claiming the obedience of the faithful. At the council of Constance in 1414, Ferdinand of Aragon was a prominent supporter of the Spaniard, Benedict XIII. (Peter de Luna), who had been deposed at Pisa in 1408. The deposition of John XXIII., and the abdication of Gregory XII. in 1415, having paved the way for peace, Ferdinand consented to be present at the meeting of Sigismund with the ambassadors of France, Castile, and Navarre in Perpignan; and after long temporizing he ultimately agreed, for the sake of the unity of the church, to withdraw his obedience from Luna. He died in the following year at Ygualada (2d April, 1416), and was succeeded by his son Alphonso V., the conqueror of Naples.

See Zurita, *Anales de la Corona de Aragon*, xi., xii.; Mariana, *Hist. Gen.*, xix. 15–xx. 8.

FERDINAND II. of Aragon and Sicily. See FERDINAND V. of Castile.

FERDINAND I. (*cir.* 1000–1065), surnamed the Great, first sovereign of independent Castile, was the second son of Sancho III. (el Mayor) of Navarre, who about 1026 compelled Bermudo III. of Leon, the last direct descendant of Pelayo in the male line, to surrender his rights over Castile, and also to give his sister Sancha in marriage to Ferdinand, then regent of that province. Sancho, towards the close of his energetic life, divided his extensive dominions among his four sons, Castile being the portion allotted to the second (1035). Bermudo of Leon, shortly after Sancho's death, sought to recover his lost possessions, but was defeated and slain in the attempt at Lantada near Rio Carrion (1038). Ferdinand, now king of Leon as well as of Castile, by a conciliatory yet firm policy, soon established his authority over his conquered subjects; and when in 1053 his dominions were invaded by his brother Garcia III. of Navarre, the attack issued in the death of the latter on the battlefield of Atapuerca near Burgos, and the annexation of a large portion of his dominions. At an early period of his reign Ferdinand began to direct his arms against the Moors; and by a series of successful campaigns he extended the Christian frontier from the Douro to the Mondego, and reduced to vassalage the emirs of Toledo, Saragossa, and Seville. Even the Arab chronicles mention his victories from Badajoz in Estremádura to Albarracin in Aragon (Gayangos, *Mohammedan Dynasties in Spain*, vol. ii.). He had set out on an expedition against Valencia when he was seized with a mortal illness which compelled him to retire to his capital (Leon), where, after having divided his dominions among his three sons, he died on the 27th of December, 1065. Ferdinand appears to have laid claim to the title of "emperor" of Spain; and Mariana alleges that at a council held at Florence in 1055 the emperor Henry III. lodged a formal complaint against this infringement of his rights of suzerainty, that this complaint was sustained by Pope Victor II., but that at a conference afterwards held at Toulouse a decision favorable to Ferdinand's imperial rights, so far they related to the territories which had been conquered from the Moors, was given, chiefly in consequence of the representations made by the famous Cid, Ruy Diaz de Bivar. Though this statement can only be received with reserve, it is certain that both in virtue of the ascendency he won for himself in Christian Spain, and also in virtue of his very considerable successes over the Moors, Ferdinand I. is fully entitled to the rank which tradition has assigned to him among the greater Spanish sovereigns.

See Mariana's *Historia General de España*, IX. i.–vi.

FERDINAND II. (1136–1188), younger son of Alphonso VIII. (el Emperador), became king of Leon on the death of his father in 1157. The history of his reign of thirty-one years is obscure. A dispute that arose between him and some of his powerful nobles gave his brother Sancho III. of Castile a pretext for invading his territory (1158), but the timely submission of Ferdinand averted serious disaster. The death of Sancho shortly afterwards led to a military occupation of Castile by Ferdinand, professedly in the interests of his nephew Alphonso III.; and this occupation lasted till the marriage of Alphonso to Leonora, daughter of Henry II. of England, in 1170. Meanwhile Ferdinand, having repudiated his wife Doña Urraca, had become involved in a war with his father-in-law Alphonso I. of Portugal, which resulted in the defeat and capture of the latter at Badajoz in 1169. The later years of the reign of Ferdinand II. were distinguished by sundry successes over the Moors, especially by a brilliant victory at Santarem (*cir.* 1181); and also by the incorporation of the great military order of Alcantara, which received its first regular charter from Pope Alexander III. in 1177. He died at Benavente (Leon) in 1188, and was succeeded by his son Alphonso IX.

Mariana, *Hist. Gen. de España*, XI. v., viii., xiii., xvi.; Gayangos, *Mohammedan Dynasties*, ii. 522.

FERDINAND III. (1200–1252), usually known as Saint Ferdinand, was the son of Alphonso IX. of Leon, and of Berenguela, sister of Henry I. of Castile. On the death of Henry without issue in 1217, the just title of Blanche, the elder of the surviving sisters, was set aside and Berenguela procured the proclamation of Ferdinand. He rapidly secured the homage of the towns and the submission of the nobles, especially of the brothers Alvaro and Fernando de Lara. On the death of his father in 1230 he ultimately, though not without dispute, became king of Leon as well as of Castile, thus finally uniting the two kingdoms under one crown. Following up the advantage which had been gained for the Christian arms by his father and the allied kings in the great battle at Las Navas de Tolosa in 1212, he devoted all his energies to the prosecution of the Moorish war. Among his conquests may be mentioned those of Ubeda in 1234, of Cordova in 1236, of Jaen in 1245, and of Seville in 1248. He was planning an invasion of Africa when he died at Seville on the 30th of May, 1252, leaving his kingdom to his eldest son Alphonso X. (Alonso el Sabio).

Though not canonized till centuries afterwards (by Clement X. in 1671), he came to be popularly known as *el Santo* from a very early period. Distinguished though he was for great military talent, he was still more remarkable for his religious zeal. Like his younger cousin Saint Louis of France, he was supremely a champion of the Catholic faith. It was not on the field of battle alone that his ardor was displayed. His Spanish panegyrists never fail to relate how it was his wont to assist in carrying wood for burning the followers of the Albigensian heresy, and how sometimes with his own royal hands he applied the torch to the pile.[1] While as a crusader he is hardly eclipsed by Louis, he contrasts very favorably with him, as a sincere friend of learning. He was the original founder (1243) of the university of Salamanca, which his son and successor did so much to foster and encourage. He it was also who caused to be translated into the vulgar tongue the *Fuero Juzgo* (Forum Judicum) or code of Visigothic laws, which as collected and translated at his instance has the double interest of being one of the oldest extant specimens of Castilian prose, and also of being the foundation of *Las Siete Partidas*, the code for Christian Spain, which was finally drawn up by Alphonso the Wise.

His body now lies in the Capilla Real of Seville Cathedral, where it is exhibited as a relic on certain annual occasions (in May, August, and November). His day in the Spanish calendar is May 30.

See Mariana, *Hist. Gen.*, XII. vii.–XIII. viii.; and compare Conde, *Dominacion de los Arabes en España*, IV. iii.–vi.

FERDINAND IV. (1285–1312), sometimes called *el Emplazado*, *i.e.*, Cited or Summoned, succeeded his father Sancho IV. on the throne of Castile and Leon in 1295. The years of his minority were disturbed by a series of civil wars caused by the pretensions of his cousins Don Juan and Don Alonso de la Cerda to the crown, by the disputes of the Haros, Laras, and other nobles about their privileges, by the restlessness of the municipalities, and by the ambition of the neighboring kings of Portugal, Aragon, and Granada. The queen-mother, Maria de Molina, on each new outbreak succeeded in procuring peace by diplomatic tact and judicious compromise. Secure at last in possession of his throne, Ferdinand was free to pursue the traditional policy of war against the Moors; and in carrying it out he was aided by pecuniary grants both from his own nobles and also from the pope (Clement V.), as well as by the spoils of the Templars on the extinction of that order in 1310. His chief exploit, as recorded by the historians, both Spanish and Arab, was the expedition against Algeciras (1309), which, while unsuccessful in its main object, resulted in the surrender of Gibraltar and the cession of other strongholds (Gayangos, ii. 348; Conde, IV., xiv.). In the course of a subsequent campaign he died suddenly at Jaen, September 7, 1312. According to Mariana, he had on the 8th of August preceding condemned to death without lawful trial two brothers of the name of Carvajal. These protesting their innocence had summoned him to meet them within thirty days at the bar of God; hence his surname. He was succeeded by his infant son Alphonso XI. (See Mariana, XV. i.–xi.)

FERDINAND V. of Castile, III. of Naples, II. of Aragon and Sicily, surnamed *el Catolico* (1452–1516), the younger son of John II. of Navarre and Aragon by his second wife Juana Henriquez of Castile, was born at Sos in Aragon on the 10th of March, 1452. On the death of his elder brother Carlos in 1461, he was recognized by the Aragonese as heir-apparent to the crown, but the Catalans, rendered indignant by the cruelty and perfidy with which Carlos had been treated, refused to recognize any further claim on their allegiance, and rose in rebellion against King John. Ferdinand accompanied his father in the campaigns which followed, and gave early promise of distinction. In 1466 his father formally associated him with himself in the government of Aragon, and in 1458 declared him king of Sicily. In October, 1469, he was married at Valladolid, in circumstances of unusual secrecy, to Isabella, sister of Henry IV. of Castile, and heiress to that throne. On the death of Henry IV. in 1474, Ferdinand and Isabella were recognized by the nobles in the junta of Segovia as joint sovereigns of Castile; but a powerful party, including the marquis of Villena, the grand-master of Calatrava, the archbishop of Toledo, and numerous other notables, as well as some of the burghs, declared in favor of Juana "la Beltraneja" (*i.e.*, daughter of Beltran), whom Henry had shortly before his death recognized as his own child, and by his will desig nated as his successor. Juana had also the support of Alphonso V. of Portugal (to whom she was betrothed in 1470) and of Louis XI. of France. The result was a civil war which continued with varying fortunes until victory finally declared for the Catholic sovereigns, and the peace of Lisbon was signed in 1479. In the same year, a few months previously, Ferdinand had succeeded his father on the throne of Aragon, though not on that of Navarre, which went to his sister Leonora de Foix. The union of Castile and Aragon, together with the prosperous termination of the civil war, gave the Catholic sovereigns leisure and opportunity for the development of a vigorous domestic policy. On their accession they had found themselves face to face with an almost anarchical condition of affairs; bitter feuds were raging in Andalucia between the great houses of Cadiz and Medina Sidonia; Galicia and other provinces were rent with hostile factions; robbery and outrage were paralyzing commerce and agriculture throughout the kingdom. One of their earliest measures for restoring the much-needed order was the reorganization and development (1476) of the ancient *hermandad* (brotherhood), a league which had been originally formed by some of the cities for mutual protection against the aggression of the nobles and of the crown, and which had already more than once, by means of its "cortes extraordinary," made its power to be felt. It was now augmented and mobilized as a body of military police for the detection and repression of all crimes against person or property committed on the highways or in the open country. For these ends it proved very useful; and also for another purpose, which is believed to have been aimed at in its constitution, that of checking the arrogance and rapacity of the feudal aristocracy. The next step for the avowed purpose of securing orderly government was the institution of the famous Inquisition as a tribunal for the repression of heresy (and, as some historians do not hesitate to add, for the extortion of money). The necessary bull was obtained from Sixtus IV. in 1478; the court was instituted at Seville in 1480, where the first *auto de fe* took place in the following year. The arrangement was extended to Aragon in 1483, Torquemada being appointed first inquisitor-general. Among other measures taken by Ferdinand and Isabella for the consolidation of their power were the assumption of the grand-masterships of the three great military orders of knighthood, and the vindication from papal usurpation of their ancient rights of ecclesiastical patronage. One result of their firm and on the whole wise policy was that between the years 1477 and 1482 the revenue of the country had been augmented nearly six-fold, and that in 1481 they were free to resume the long-suspended war against the Moors. From the capture of Alhama to the fall of Granada in 1492 (1st January), the Christian arms had met with a series of uninterrupted successes which resulted in the final extinction of the Mahometan power in Spain,—the Moors, however, being permitted the enjoyment of certain stipulated privileges, that of the free exercise of their religion being one. In March, 1492, the edict for the expulsion of the Jews was signed at Granada, and it was on the 3d of August in the same year that Columbus sailed from Palos in Andalucia, landing on the island of San Salvador on the 12th of October. In 1493 Ferdinand began to look abroad and take a practical interest in European affairs. By the treaty of Senlis he secured from Charles VIII. the restoration of Roussillon (now the department of Pyrénées Orientales) and of Cerdagne (now part of Catalonia), which had been mortgaged by John II. of Aragon to Louis XI. In 1494, Charles VIII. having undertaken his great Italian expedition, Ferdinand entered into an alliance with the emperor, the pope, and the states of Milan and Venice, and thus gained a footing in Italy for the Spanish troops, which, under Gonsalvo de Cordova, succeeded in expelling Charles from Naples in 1496. By the peace of 1498, however, the throne of that kingdom was left in possession of Frederick. In 1499 the liberty of worship which had been guaranteed to the Moors of Granada was treacherously withdrawn; serious risings in the Alpujarras (Sierra Nevada) were the consequence (1501); a decree was issued in 1502 offering to the conquered insurrectionists the alternatives of baptism or exile; and, the latter being usually chosen, Spain had to suffer a second time the loss of many of her most useful subjects. The Neapolitan war again broke out in 1500, and an alliance was formed between Ferdinand and Louis XII. on the basis of a partition of their conquests. This pact was broken by Ferdinand, who by the battles of Cerignola and Garigliano became sovereign of Naples (Ferdinand III.) in 1504. The death of Isabella took place on November 23d of the same year; and in accordance with her will Ferdinand immediately caused his daughter Juana to be proclaimed queen and himself regent. Philip archduke of Austria, the husband of Juana, having disputed the rights of his father-in-law and threatened an appeal to arms, the latter in disgust, with the view of again separating the crowns of Aragon and Castile, entered into negotiations with Louis XII., married Germaine de Foix, the niece of Louis (1505), and shortly afterwards resigned the regency of Castile. On the death of Philip in 1506 he resumed the administration, though not without opposition, and retained it till his death. In 1508 he joined the league of Cambray for the partition of Venice, and thus without any trouble became master of five important Neapolitan cities. In the following year (1509) the African expedition of Cardinal Ximenez was undertaken, which resulted in the conquest of Oran. In 1511 Ferdinand joined Venice and Pope Julius II. in a "holy league" for the expulsion of the French from Italy. This gave a pretext for invading Navarre, which had entered into alliance with France, and been laid under papal interdict in consequence. Aided by his son-in-law, Henry VIII. of England, who sent a squadron under the marquis of Dorset to co-operate in the descent on Guienne, Ferdinand became master of Navarre in 1513; and on the 15th of June, 1515, by a solemn act in cortes held at Burgos, he incorporated it with the kingdom of Castile. He died at Madrigalejo (Estremadura) early in the following year, 23d January, 1516. It is said that his death was accelerated by a potion which in his desire for posterity he had taken in order to reinvigorate his exhausted constitution. He was succeeded by his grandson, Charles I. of Spain, more generally known by his European title as the emperor Charles V.

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[1] Thus Calderon, in his *Auto Historial Alegorico* entitled *El Santo Rey Don Fernando* (Madrid, 1690), introduces Ferdinand as declaring to St. Dominic his firm determination to apply the cautery which alone can cure the cancer of heresy. He is ready to have his own arm destroyed should it fail him in this duty. Compare Mariana, *Hist. Gen.*, XII. xi.

Though by no means a great general, Ferdinand possessed undoubted military capacity; though not a great statesman, he had abundant political skill. The largeness of his ambition was somewhat incongruously associated with a narrowness of view which showed itself very unfortunately for Spain in many instances, particularly in his treatment of the Moors and Jews, and with a smallness of nature which suffered him to treat with neglect his most faithful servants and greatest benefactors, such as Columbus, Navarro, and Ximenez himself. Yet his name is inseparably associated with the most splendid of all periods in the annals of Spain. It was under his guidance that the kingdom was consolidated and grew into its position of highest prosperity and greatest influence as a European power. And this must be admitted even when it is remembered that few sovereigns have been associated with such consorts as Isabella was, or surrounded by a band of men so distinguished as were Mendoza, Talavera, Ximenez, Gonsalvo de Cordova, and Pedro Navarro.

See Zurita, *Anales*, tom. v. and vi.; Mariana, *Hist. Gen.*, xxiii.–xxx.; and Prescott's brilliant *History of the Reign of Ferdinand and Isabella.*

FERDINAND VI. (1713–1759), king of Spain, sometimes called the Sage, the younger son of Philip V. and Maria Louisa of Savoy, was born at Madrid, September 23, 1713. On the death of his elder brother Louis in 1725, Ferdinand was proclaimed prince of the Asturias; and in 1729 he was betrothed to Barbara, daughter of John V. of Portugal. He succeeded his father on July 9, 1746. Since 1739 Spain had been involved in protracted war, first with England in consequence of disputes relative to British interests in the West Indies, and afterwards, since 1740, with Austria on the accession of Maria Theresa. It was Ferdinand's first endeavor on coming to the throne to secure peace for his exhausted country, and one of the earliest acts of his government was to order the withdrawal of the Spanish troops from Italy (August, 1746). Soon afterwards negotiations were opened for peace with England; and these, though frequently interrupted, ultimately resulted in the treaty of Aix-la-Chapelle, which terminated the war of the Austrian succession, thus restoring peace to Europe (October, 1748). Weak in health and despondent in temperament, Ferdinand had no inclination thenceforward to take an active part in European affairs, and the management of the public business he abandoned almost entirely to his ministers Ensenada, Carvajal, and Wall. These, however, always found it necessary to take into their counsels the queen, to whom

Ferdinand was much attached, the royal confessor Rabago, and the singer Farinelli, whose musical powers had given him extraordinary influence. During this reign the condition of Spanish finance was much improved; agriculture, commerce, and the arts were encouraged; by a concordat with Pope Benedict XIV., in 1753, many abuses of ecclesiastical patronage were reformed; nor were the affairs of the army and navy neglected. On the outbreak of the Seven Years' War in 1756, Spain steadfastly maintained a strict neutrality, notwithstanding the repeated efforts both of France and of England to secure her intervention, the former offering Minorca and the latter Gibraltar as the price of her assistance. On the death of his consort in 1758, Ferdinand fell into a profound melancholy, which issued in a confirmed insanity, under which he died at Villaviciosa on the 10th of August, 1759. Leaving no issue, he was succeeded, in terms of the treaty of Aix-la-Chapelle, by his half-brother Charles III. Though he was in no sense an able sovereign, and was remarkable for nothing unless for a pacific and kindly disposition, his reign was an exceptionally prosperous one for Spain, and critics generally concur in the observation of Coxe that, "since the elevation of the house of Bourbon to the throne of Spain, no period occurs in which the interests and independence of the kingdom were so well and so consistently supported as during the reign of Ferdinand VI."

See Coxe, *Memoirs of the Kings of Spain of the House of Bourbon*, chaps. 48–58.

FERDINAND VII. (1784–1833), king of Spain, the eldest son of Charles IV. and of Maria Louisa of Parma, was born at San Ildefonso, October 14, 1784, and became prince of the Asturias on the accession of his father in 1788. The year of his birth had also been the year of Godoy's arrival at court (see ALCUDIA); and the sinister influences of the royal favorite soon began to manifest themselves there. Ferdinand from a very early age learned to dislike Godoy, and he found many to sympathize with him in his not unnatural aversion. In 1802 he was married to Maria Antonietta, daughter of the king of Naples, and she, along with his former tutor Escoiquiz, the dukes of San Carlos, del Infantado, and others, fostered in him the spirit of resistance to the ascendency of "the Prince of the Peace." Soon after her death in 1806 (attributed by him, though without sufficient evidence, to foul play), and the forcible removal of Escoiquiz, the court became openly divided into two hostile factions; but though Godoy had the entire confidence of the king and queen, Ferdinand had the almost undivided sympathies of the people. On the 30th of October, 1807, he was suddenly laid under arrest on a charge of conspiracy against the crown and life of his father; but no documentary evidence against him could be produced, except a draft memorial, apparently intended for presentation to the king, in which the conduct of Godoy was bitterly complained of, and a letter to Napoleon appealing for protection, and expressing a desire to enter into a matrimonial connection with the Bonaparte family. When it was found that the French ambassador had been cognizant of these intrigues, the matter was hushed up and Ferdinand pardoned; but meanwhile the rapid movement of events, political and military, had begun to make Godoy's position an extremely precarious one. Ostensibly following out the terms of the agreement at Fontainebleau of October 27, 1807, Napoleon had not only invaded Portugal, but had also begun to pour troops into Spain (December, 1807). The Spanish people were beginning to show signs of restiveness, and, dreading an outbreak, Godoy had advised the withdrawal of the king and queen to Seville with a view to the possible necessity for a further flight to Mexico. But before this project could be carried out the revolutionary rising at Aranjuez had taken place (March 17–18, 1808), which resulted in the forced abdication of Charles, the final overthrow of Godoy, and the enthusiastic proclamation of Ferdinand as king (19th March). This last proceeding had been no part of Napoleon's plan; and Madrid was occupied four days afterwards by the French troops under Murat. By the representations of the latter, both Charles and Ferdinand were induced to seek a personal interview with Napoleon at Bayonne, and submit to his arbitration their rival claims. The result was the treaty of Bayonne between Charles and Napoleon (5th May, 1808), by which the former finally renounced the Spanish throne. Next day Ferdinand also was compelled to give up his claims; it was declared that the Bourbons had ceased to reign in Spain; and shortly afterwards Joseph Bonaparte was proclaimed king. Ferdinand was now interned at Valençay (Indre), where he remained during the whole of the Spanish war of independence, receiving from Napoleon an annual allowance of 600,000 francs. The letters he wrote to Napoleon from his captivity were certainly far from indicating patriotism: most people will doubt whether they were consistent with any self-respect. He had nothing but compliments to offer on the accession of Joseph; he assured his master of his ardent prayers for his prosperity, and of his most respectful and absolute attachment to his august person; he wrote to public men to say, "My highest desire is to prove myself to be the emperor's adopted son, by my entire submission and obedience to his wishes and desires."

The decisive victory of Wellington at Vittoria (21st June, 1813), followed up by the invasion of France, induced Napoleon to treat with his captive on terms more nearly approaching those of equality (November, 1813), and ultimately the title of Ferdinand and his dynasty to the throne of Spain was recognized on his agreeing to sign a convention in which it was undertaken on his part to expel the English from the Peninsula, to pardon all those who had given their obedience to Joseph Bonaparte, and to restore the harmonious relations of the two kingdoms as these had subsisted prior to 1792. On his return to Spain in March, 1814, the cortes declined to recognize him until he should have sworn to the constitution which had been promulgated at Cadiz in 1812; but, listening to the counsels of the "servile" party, he first evaded and afterwards rejected this demand. On the 4th of May he, by the decree of Valencia, annulled the constitution of 1812 and all enactments made by the cortes in his absence; on the 30th of the same month he issued his decree of proscription and perpetual exile against the *afrancesados*, or those who had given obedience to Joseph Bonaparte; on the 21st of July he re-established the Inquisition, with all the powers it had possessed under Torquemada, and began a hot crusade against "liberalism" or "constitutionalism," in which no weapon of confiscation, or imprisonment, or banishment, or execution, which despotism could wield was left unemployed. This policy of the absolutist "camarilla" was for some time interrupted by a revolutionary party headed by Quiroga and Riego at Cabezas de San Juan near Cadiz, which, on the 1st of January, 1820, caused the constitution of 1812 to be again proclaimed. The insurrection gaining daily in strength, the king was compelled to make concession after concession, until at length on the 9th of March he solemnly professed his entire acceptance of the popular constitution, abolished the Inquisition, banished the Jesuits, and restored the freedom of the press. The cortes reassembled, and the citizens who had been banished reappeared. But very soon the king began to show how insincere his submission had been. Sometimes secretly, sometimes openly, he did all in his power to encourage the opposition, until at last, in July, 1822, the royal guard broke out into open revolt with cries for "the absolute king." For the time they were repressed by the constitutionalists; but meanwhile the state of the Peninsula had attracted the attention of the Holy Alliance, and at the congress of Verona (August 25 to December 14, 1822) it was agreed to send a French army into Spain, "to deliver Ferdinand from slavery." Madrid was entered on May 23, 1823; the cortes withdrew to Seville, where Ferdinand was declared incapable of governing, and a regency was appointed (11th June). Driven by the invaders to Cadiz, and there compelled to surrender, the cortes yielded up their authority into the hands of Ferdinand, who in his turn promised a general amnesty to all who had been concerned in the revolutionary proceedings. This promise he broke the very next day, annulling every act of his government since 7th March, 1820. Another period of proscriptions, banishments, and fusillades now set in. Enactments of the most tyrannical description were unscrupulously made with the avowed purpose of stamping out the last spark of constitutionalism.[1] Numbers were put to death for the most trivial offences, and it has been estimated that some 20,000 families were compelled to leave their country. Louis XVIII. offered counsels of moderation; he reminded Ferdinand that "Christian princes ought not to rule by means of proscriptions," and that "a blind despotism, far from consolidating the power of sovereigns, weakens it;" but his remonstrances were in vain. His successor Charles X. used similar language; but Ferdinand's reply was that he was not able to control the reactionary party which had restored him to power. During the later years of his life he took little or no interest in public affairs; and the absolutists began to turn their attention to the question of the succession. A scheme was matured for inducing the king to abdicate in favor of his brother Don Carlos; but on the death of his third wife Maria Amalia of Saxony in May, 1829, without issue, Ferdinand filled the "apostolicals" with consternation and the liberals with new hope by contracting a fourth marriage with Maria Cristina of Naples (December, 1829). In March, 1830, the king decreed the abrogation of the Salic law,—a measure which excited the Carlists first to intrigue and afterwards to open insurrection on the birth of a daughter in October. In 1832 Ferdinand was seized with a threatening illness, and wavered from his formerly expressed will with regard to the succession; but ultimately, in June, 1833, his daughter (Isabella II.) was declared his successor, Cristina was nominated as regent, and Don Carlos with many of his followers was ordered to leave the kingdom. The death of Ferdinand at Madrid, September 29, 1833, was the signal for the outbreak of a long and bloody civil war.

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[1] Thus the decree abolishing popular election of the ayuntamientos (17th October, 1824) was expressly made "con el fin de que desaparezca para siempre del suelo Español hasta la mas remota idea de que la soberanía reside en otro que en mi real persona."

Ferdinand's selfishness, hypocrisy, mendacity, incapacity to understand even the idea of patriotism, have sometimes suggested a comparison with Charles I. of England. But such a comparison is unjust to Charles. Ferdinand was a Spanish Bourbon, and in him the characteristic qualities of that house reached their final perfection — "imbecility, dissoluteness, ferocity, mutual hate, intellect never reaching higher than cunning, with a religion that was the fetichism of a savage rather than the creed of a rational being."[1] His reign was a disastrous one for Spain. Its results may be summed up as follows —loss of her American possessions—New Granada, New Spain (Mexico), Rio de la Plata, Chili, Venezuela, Guatemala, and Peru; hopeless financial embarrassment; thousands of her best citizens put to death for political opinions; myriads banished; and a quarter of a million slain in unnecessary wars.

FERDINAND I. and II., grand-dukes of Tuscany. See MEDICI.

FERDINAND III. (1769–1824), grand-duke of Tuscany, and archduke of Austria, second son of the emperor Leopold II., was born on the 6th May, 1769. On his father becoming emperor in 1790, he succeeded him as grand-duke of Tuscany. Ferdinand was the first sovereign to enter into diplomatic relations with the French republic; and although afterwards compelled by England and Russia to join the coalition against France, he concluded peace with that power in 1795, and by observing a strict neutrality saved his dominions from invasion by Napoleon till 1799, when he was compelled to vacate his throne, and a provisional republican government was established at Florence. Shortly afterwards the French arms suffered severe reverses in Italy, and Ferdinand was restored to his territories, but in 1801 Tuscany was converted into the kingdom of Etruria, and he was again compelled to return to Vienna. In lieu of the sovereignty of Tuscany, he obtained in 1802 the electorship of Salzburg, which he exchanged in 1805 for that of Würzburg. In 1806 he was admitted as grand-duke of Würzburg to the confederation of the Rhine. He was restored to the throne of Tuscany, after the abdication of Napoleon in 1814, but had again to vacate it for a short time in 1815, when Murat proclaimed war against Austria. The final overthrow of the French supremacy at the battle of Waterloo secured him, however, in the undisturbed possession of his kingdom during the remainder of his life. The mild and righteous rule of Ferdinand, his solicitude for the welfare of his subjects, his enlightened patronage of art and science, his encouragement of commerce, and his sympathy with freedom render him an honorable and striking exception to the generality of Italian princes. He died on the 18th of June, 1824.

FERDINAND (1721–1792), duke of Brunswick, a famous Prussian general, the fourth son of Duke Ferdinand Albert of Brunswick, was born at Brunswick, 11th January, 1721. He was educated for the military profession, and having entered the Prussian service, commanded a regiment in the first and second Silesian wars. On the outbreak of the Seven Years' War he was appointed to the command of a division, and he greatly contributed to the victory of Prague in 1757. He shortly afterwards received from George II. of England the supreme command of the allied forces, and for five years, by his energy, rapidity of movement, and masterly strategy, succeeded, notwithstanding the fewness of his troops and their very mixed and heterogeneous composition, in holding at bay both the large imperial army and several French armies much better organized and officered than his own. On the 1st of August, 1759, he gained a brilliant victory over Marshal Contades at Minden. In 1766 an estrangement occurred between Ferdinand and Frederick the Great, in consequence of which he retired from the military profession, and passed the remainder of his life at his castle of Veschelde where he occupied himself in building and other improvements, and became a patron of learning and art, and a great benefactor of the poor. He died 3d July, 1792.

See Knesebeck, *Ferdinand Herzog von Braunschweig und Lüneburg, während des Siebenjährigen Kriegs*, 2 vols., Hanover, 1857–58; Von Westphalen, *Geschichte der Feldzüge des Herzogs Ferdinands von Braunschweig-Lüneburg*, 5 vols., Berlin, 1859–72; and Carlyle's *History of Frederick the Great*.

FERENTINO, the ancient *Ferentinum*, a town of central Italy, in the province of Rome, is situated on the Neapolitan railway about 45 miles S. E. of Rome. It lies on the side of a hill rising immediately to the left of the Via Latina. It possesses mineral springs, a cathedral, and some interesting remains of the ancient Ferentinum. These consist chiefly of the old walls built somewhat in the cyclopean style, a kind of citadel on the top of the hill, on which the cathedral now stands, and various other portions of old Roman buildings containing numerous inscriptions. The ancient Ferentinum at one time belonged to the Volsci, but soon after the defeat of that people by the Romans in 413 B.C. it was made over with the adjoining territory to the Hernici. It was taken by the Romans in 361 B.C., but so leniently dealt with that, when the Hernici rebelled for the third and last time, Ferentinum was one of the three Hernician cities that refused to join the revolt. In consideration of this the inhabitants were allowed to retain their own laws, which they preferred to the Roman code; but after the social war they accepted the franchise. The population in 1871 was 8360.

FERENTO, the remains of a city of Etruria whose ancient name was *Ferentinum*. They are situated on the northern slope of the Ciminian hills, about five miles from Viterbo, and the same distance from the banks of the Tiber. The ancient city was the birthplace of the emperor Otho, and possessed a very old and splendid temple of Fortune. In the 11th century the city was destroyed by the inhabitants of Viterbo, and it is now uninhabited. Various portions of its walls and gates are still extant, but the principal building of which the remains still exist is a theatre of very peculiar construction.

FERGHANA, now a province of Russian Turkestan, is the valley containing the head-waters of the Sír Darya or Jaxartes (one of the two great feeders of Lake Aral), and lies among the western ranges of the Thian Shan mountains, which enclose it on every side except at its west extremity, where the river emerges, passing Khojend, into the plains of western Turkestan. It is of oval form, and extends approximately from 70° to 74° E. long., and from a little below 40° to 42° N. lat., having on the N. the mountains which separate it from the valleys of the Chirchik and the Talas, and on the S. the comparatively unbroken chain which divides it from the mountain state of Karategin, and farther east from the long highland strath or steppe of the Alai.

There is only one road into Ferghana practicable for wheeled vehicles, viz., that from Khojend. The road from Bokhara to Kashgar enters the valley at the same place, and, passing along its entire length, crosses the southern border range by the Terek pass. This road, which passes through the chief towns of the province, was before our era perhaps the most important route of the active trade between China and the West, and has ever since been much frequented for general purposes. The direct road from Bokhara to Kuldja also runs through Ferghana, but the longer and easier route by Tashkend is usually preferred. Roads to Badakhshán and the south cross the Alai range by passes 12,000 to 14,000 feet high.

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[1] Crowe, *History of France*, iv. 151.

The Sír Darya rises in the south-east corner of the valley, but only takes that name after joining the Naryn, a much longer and more considerable stream, having first given off several large canals for irrigation. Its affluents from the north are few and unimportant; about one-third of the valley lies to the north of the Sír, where, except in the rich districts round and to the east of Namanghán, the land is usually poor, hilly, and ill-watered. On the south, however, along the foot of the hills, a rich belt of cultivation 10 to 27 miles wide extends with few interruptions for about 160 miles. For luxuriant beauty this region is unequalled in Central Asia, and its wealth, being the combined result of climate, soil, and abundant water, might be developed indefinitely. The banks of the Sír (like those of the Naryn) are almost everywhere sandy and sterile, for its waters are scarcely used for irrigation except near its source, and countless streams flowing from the southern mountains are absorbed by irrigation before reaching it. These mountains fall gradually towards the valley (whose greatest width is about 65 miles) in a succession of minor parallel ranges, inclosing terraces or valleys, each usually with its village, and cultivated up to over 4000 feet. These valleys are of easy slope; the transverse valleys through which the streams force their way to the plain are shorter, steeper, and less capable of cultivation. Rich alpine pastures occur at the heads of the valleys; the barren tracts in the plain are used for winter grazing.

Agricultural Produce, etc.—All the products of the valley (which is 1200 to 1500 feet above sea-level) are cultivated up to 3000 or 4000 feet. Grapes, indeed, ripen at 5800 feet, and barley at 8500. Produce is classed for taxation under three heads—field produce, garden produce, and fruit-trees. Among the first are wheat, barley, rice, pulses, maize, sorghum, and millet; among the second, melons, water melons, pumpkins, pease and beans, onions, garlic, carrots, red-pepper, madder and other dye-plants, cotton, tobacco, flax, and oil-seeds. Among the fruits are excellent grapes, apples, pears, plums, peaches, almonds, mulberries, figs, and pomegranates.

Climate.—The climate generally is healthier and more equable than that of Russian Turkestan. The winters are milder, and in summer, though the heat is oppressive, the nights are cool. Little rain falls except in the mountains. The sky is sometimes darkened by a dry mist of fine dust, to which, in great measure, Richthofen attributes in other parts of Asia the formation of vast deposits of loess (see vol. v. p. 550).

Towns.—The principal towns, which nearly all lie in the fertile belt above described, are—Khokand, the late capital of the khanate, with a population of 50,000 to 70,000; Namanghán, the only important place north of the Sír Darya, 20,000; Andiján, the capital in Baber's time, 20,000; and Marghilán, the chief seat of the silk manufacture, 30,000. Ush, with Usgand, Gulsha, and other smaller places in the hill district to the south-east, is frequented by the Kirghiz, who cultivate their barley and wheat in the neighborhood. Usgand appears, from its architectural remains of the 12th century, to have been a place of considerable extent. Kassan, in the north, is a very ancient Tajik town.

Population.—The population of Ferghana, which for Central Asia is a thickly-peopled region, is about 900,000, of which perhaps two-thirds are settled and the remainder nomad. The settled population consists chiefly of Tajiks and Uzbegs; the former, the early Aryan inhabitants, are found in greatest purity in the lower mountain valleys; those in the chief towns and central districts, who are known as Sarts, show a large infusion of Uzbeg and other Turki blood. The Uzbegs, who predominate in numbers, are here much more modified by the Tajik element than they are in Bokhara. Being the dominant race, their name is assumed by the various other Turk and Tatar elements, which in successive waves have swept over or occupied this region for more than 2000 years. There are also settlements of Kashgaris, who have fled from Chinese oppression. The nomads are mainly Kipchaks and Kara Kirghiz or Buruts; the former, the braver and more capable race, is indeed only half nomadic, occupying chiefly the northern and eastern districts of the valley. The others have their summer quarters in the surrounding mountains and high plateaus, chiefly in the Alai and Pamir, and winter in the valley, where they eke out a livelihood by cultivating patches of barley, wheat, and lucerne, thus becoming amenable to taxation and control. They are poorer than the settled population, who are usually well-to-do. The townspeople especially are fond of good living and sociable, and being, like the Sarts everywhere, keen traders, drive good bargains with the simpler nomads. They are Sunni Mahometans; their language the classic Chaghatai Turkish, slightly influenced, M. Vambéry says, by the harsher dialect of the tribes to the north-east.

History.—Ferghana was not protected by its mountain barriers from the vicissitudes which befell its neighbors. Overrun by the Arabs in 719, and subject to the Samanides in the 9th and 10th centuries, it formed part, successively, of the conquests of the Kara Kitai, of Jenghiz Khan, and of Timur, whose descendant Baber was expelled in 1513 by the Uzbegs. After a long period of disintegration the khanate was reconsolidated about 1770 by Narbuta Bai, a reputed descendant of Baber, and until 1853, when the last series of Russian aggressions began, the dominions of his successors, the khans of Khokand, extended far beyond the valley of Ferghana to the north and northwest. Their influence, everywhere considerable, was most actively exerted in Kashgar, probably from commercial reasons, the Chinese allowing them to maintain agents there to supervise the Khokandi traders and collect dues. The encroachments of Russia were made easier by the continual jealousy between Khokand and Bokhara, and by dissensions between the nomad and settled populations. The late ruler, Khudayar Khan, though more than once driven out by his oppressed subjects, always kept on good terms with the advancing Russians, who in 1874 sent a mission to Khokand. They found Khudayar setting out to suppress a Kirghiz rising, and, as the disturbances increased, persuaded him to retire with them and to place his country at the disposal of the czar. They then ostensibly adopted his son Nasr-ed-din, appropriating, at the same time, all the country north of the Sír. Their conduct, however, soon fanned the existing irritation into a religious war against the Russians, whose position for a time was critical, and the movement was only crushed, and the province annexed, after great destruction of life and property.

Trade.—There are no trustworthy statistics of the trade of Ferghana. Russian produce is probably imported to the value of 2,600,000 rubles (about £370,000), chiefly cotton, woollen, and leather manufactures, yarn, and hardware.

Most of the tea comes ostensibly from Russia; but a great deal of Indian tea is smuggled in. The chief exports are silk and cotton. Raw silk, value about Rs.637,000,[1] raw cotton, Rs.930,000, and cotton manufactures and yarn, Rs.330,000, go to Tashkend, the principal mart of Russian Turkestan. Among minor exports are timber, flax, wool, salt, and fruits fresh and dried. There is also a good deal of trade with Bokhara and with Kashgar. Manufactures are little developed: coarse cotton stuffs are made in large quantities for home use and export; also some woollens, hardware, and pottery of a certain merit. There are paper-mills at Khokand and at Charku, which supply nearly all Central Asia; the manufacture resembles the Chinese, one of the few remaining traces of a former extensive intercourse. Gun factories of a rude order exist at Khokand and Andiján.

There is considerable mineral wealth. Naphtha, rock-salt, and gypsum are extensively worked; iron-ore, argentiferous lead, coal, and sulphur have been found, and gold in the headstreams of the Sír.

Revenue.—The revenue (under the late system, which the Russians have in the main adopted) has been about £360,000,[2]—the chief items being the *kharáj*, or land tax, paid in grain, £202,000; the *tanapna*, on garden produce and fruit trees, £67,000; and the *zakát* (one-fortieth part), on the cattle of the nomads, on exports and imports, on trade licenses, etc.

Administration.—The Russians have divided Ferghana into seven districts, viz., Khokand, Marghilán, Andiján, Ush, Uchmián or Wadil, Namanghán, and Chust. The administrative centre is removed from Khokand to Marghilán, as the nomads are more easily controlled from that quarter. Justice is administered in civil cases by the *shariat*, or Mahometan code, a Russian procureur being present; in criminal cases by the Russian code. The affairs of the nomads are managed by their own elders, who are obliged to adopt any new regulations imposed by the Government.

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[1] The total production is estimated by Petrofski, agent to the Russian ministry of finance, at 10,000 to 15,000 puds of 36℔ each, value 2 to 3 millions of rubles.

[2] It was estimated in 1877 at £272,000, showing that the country had not then recovered from the effects of the war of annexation.

Ferghana is mentioned by Chinese writers of the Han dynasty (from 200 B. C.); by Hiouen-thsang, the Buddhist pilgrim, in the 7th century; by various Arab writers between the 10th and 13th (see D'Herbelot and the *Oriental Geography*); in the accounts of the wars of Timur in the 14th century (see Deguignes's *Histoire des Huns*, etc.), of his son Shah-rukh's mission to China (1419), and of the Chinese mission to him; in the emperor Baber's Memoirs and Mirza Haidar's *Tarikhi-Rashidi* in the 16th century (see Dr. Bellew's "History of Kashgar" in Forsyth's *Report of the Mission to Yarkand*); in the great *Chinese Geography* of the 18th century, translated by Klaproth (*Magasin Asiatique*). See also *Notices of the Mediæval Geography and History of Central and Western Asia*, by E. Bretschneider, M. D.

Modern authorities are—Schuyler's *Turkestan;* Fedchenko's *Travels in Turkestan* (Russian), 1875; Terentief, *Russia and England contending for the Markets of Central Asia* (Russian), 1876; *History of Khokand*, by Sodhi Hukm Singh of the Punjab Secretariat, edited by Major C. E. Bates: "Journey to the W. Portion of the Thian Shan Range, etc., by N. Severtsof, translated by R. Michell, *R. G. S. Journal*, 1870; communications of Ujfalvy in *Bul. de la Soc. Géog. de Paris*, 1877–78; "Das Gebiet Ferghana, das frühere Chanat Chokand," from the *Russische Revue*, by A. Kuhn. (C. T.)

FERGUSON, Adam (1723–1816), a distinguished philosopher and historian, was born, June 20, 1723, at Logierait, Perthshire, of which parish his father was minister. He received the rudiments of his education at the village school of his native parish, after which he was removed to Perth grammar-school, where he made remarkable progress in classical literature. Toward the end of 1738 he entered the university of St. Andrews, where he took the degree of M.A. on 4th May, 1742. In November of the same year he entered the divinity hall, and in 1745, although he had studied divinity only one half of the usual period, he was allowed by the General Assembly to be ordained by the presbytery of Dunkeld, on the representation that he had been selected as the fittest person, from his knowledge of the Gaelic language, to fill the office of chaplain to the 42d regiment, under the command of Lord John Murray. When this regiment was at the battle of Fontenoy, Ferguson went into action at the head of the attacking column with a drawn broadsword in his hand, and could with difficulty be persuaded to retire to the rear. He continued attached to the regiment till 1754, after which he resolved to devote himself to literary pursuits. About the beginning of 1757, on the resignation of David Hume, he was elected librarian and clerk to the Faculty of Advocates, but these offices he relinquished in about a year on becoming tutor to Lord Bute. In 1757 he rendered himself conspicuous by the interest he took in the success of the tragedy of *Douglas*, written by his friend Home; and by a pamphlet, *The Morality of Stage Plays seriously considered*, which he published in its defence.

In 1759 Ferguson succeeded Dr. John Stewart as professor of natural philosophy in the university of Edinburgh. In 1764 he was transferred to the chair of moral philosophy, and within little more than a year after he published his *Essay on the History of Civil Society*, which was received with much approbation, and was translated into several European languages. Soon afterwards he began to collect materials for a history of the Roman commonwealth. Whilst thus engaged, he was solicited by the guardians of Charles, earl of Chesterfield, to superintend that young nobleman's education, which had been much neglected. He joined his young charge at Geneva in May, 1774, and remained with him for about a year. In his absence he had very nearly been deprived of his office in the university, the town-council having, as patrons, proposed to declare the chair vacant. In 1776 Ferguson published a pamphlet on the American revolution in opposition to Dr. Price's "Observations on the nature of civil liberty," in which he sympathized with the views of the British legislature. When the Government resolved to send out commissioners to quiet the disorders in the colonies, he was appointed secretary. They failed to accomplish the object of their mission, but the Government obtained through them fuller information regarding the state and temper of the Americans than they had previously possessed.

In 1780 Ferguson had a paralytic attack, which was one of the most remarkable on record, for, by an abstemious diet, he continued to enjoy almost uninterrupted good health for more than thirty years, while his mental powers were not impaired. In 1783 his great work, the *History of the Progress and Termination of the Roman Republic*, appeared in 3 vols. 4to; it was very popular, and went through several editions. In it Ferguson gives, in a connected and elegant form, a narration of the great facts of Roman history for a period of five hundred years. He was led to undertake this work from a conviction that the history of that remarkable people during the period of their greatness was a practical illustration of those ethical and political doctrines which were the object of his peculiar study.

No longer able to undergo the fatigue of public teaching, Ferguson in 1785 resigned his chair in the university, in which he was succeeded by Dugald Stewart, then professor of mathematics. He now proceeded to revise his academic lectures, and in 1792 they were published under the title of *Principles of Moral and Political Science.*

In his ethical system Ferguson treats man throughout as a social being, and illustrates his doctrines by political examples. As a believer in the progression of the human race, he placed the principle of moral approbation in the attainment of perfection. His speculations have been carefully criticised by Cousin, who thus expresses himself with reference to this theory:—"We find in his method the wisdom and circumspection of the Scottish school, with something more masculine and decisive in the results. The principle of *perfection* is a new one, at once more rational and comprehensive than benevolence and sympathy, which in our view places Ferguson as a moralist above all his predecessors." By this principle Ferguson endeavors to reconcile all moral systems. With Hobbes and Hume he admits the power of self-interest or utility, and makes it enter into morals as the law of self-preservation. Hutcheson's theory of universal benevolence and Smith's idea of sympathy he combines under the law of society. But, as these laws are the means rather than the end of human destiny, they are subordinate to a supreme end, and this supreme end is perfection. In the political part of his system Ferguson follows Montesquieu, and pleads the cause of well-regulated liberty and free government.

When in his seventieth year, Ferguson, intending to prepare a new edition of his Roman history, resolved to visit Italy. He visited some of the principal cities of Europe, and passed part of the winter of 1793 at Rome. He was generally well received, and was elected a member of the Academy of Sciences of Berlin, of the Etruscan Society of Antiquaries at Cortona, and of the Arcadia at Rome. From 1795 he resided successively at the old castle of Neidpath near Peebles, at Hallyards on Manor water, and at St. Andrews, where he died February 22, 1816.

Besides the works above mentioned, Ferguson is the author of *Analysis of Pneumatics and Moral Philosophy*, Edinburgh, 1766; *Institutes of Moral Philosophy*, 1769, 1773, 1785, translated and used as a text-book in several foreign universities; and a few minor publications. See a biographical sketch by J. Small, in *Trans. of the Royal Society of Edinburgh*, vol. xxiii.

FERGUSON, James (1710–1776), an eminent mechanist and astronomer, was born near Keith in Banffshire in 1710, of parents in very humble circumstances. He first learned to read by overhearing his father teach his elder brother, and with the help of an old woman was "able," he says in his autobiography, "to read tolerably well before his father thought of teaching him." After receiving further instruction in reading from his father, who also taught him to write, he was sent for three months to the grammar-school at Keith. His taste for mechanics was about this time accidentally awakened on seeing his father making use of a lever to raise a part of the roof of his house—an exhibition of seeming strength which at first "excited his terror as well as wonder." On discovering how the seeming wonder was effected, he began experiments with the view of improving on the simple lever his father had made use of; and although he soon learned that all his inventions had been anticipated, he was so well pleased to find his principles confirmed that his passion for the study of mechanics was increased rather than diminished. As soon as his age permitted he was sent to a neighboring farm to keep sheep, where in the day time he amused himself by making models of mills and other machines, and at night in studying the stars. Afterwards, as a servant with a miller, and then with a doctor, he met with hardships which rendered his constitution feeble through life. Being compelled by his weak health to return home, he there amused himself with making a wooden clock. When slightly recovered he showed this and some other inventions to a neighboring gentleman, who engaged him to clean his clocks, and also desired him to make his house his home.

He there, at the suggestion of a lady visitor, commenced to draw patterns for needle work, and his success in this art led him to think of becoming a painter. Through the assistance of the same lady he was at length sent to Edinburgh, where, having obtained some instruction in drawing, he began to take portraits in miniature, by which means, while engaged in his scientific studies, he supported himself and his family for many years. On account of the success of his *Astronomical Rotula*, he determined, in 1743, to leave Edinburgh for London, where he published some curious astronomical tables and calculations, and afterwards gave public lectures on experimental philosophy. These he repeated in most of the principal towns in England. His deep interest in his subject, his clear explanations, his ingeniously constructed diagrams, and his mechanical apparatus rendered him one of the most successful of popular lecturers on scientific subjects. It is, however, as the inventor and improver of astronomical and other scientific apparatus, and as a striking instance of self-education, that he claims a place among the most remarkable men of science of his country. His manners were unaffected and courteous, and his life simple, studious, and irreproachable. In 1763 he was elected a fellow of the Royal Society, and in 1770 a member of the American Philosophical Society. During the latter years of his life he was in receipt of a pension of £50 from the privy purse. He died in London 17th November, 1776.

Ferguson's principal publications are *Astronomical Tables*, 1763; *Lectures on Select Subjects* (1st ed. 1761, edited by Sir David Brewster in 1805); *Astronomy explained upon Sir Isaac Newton's Principles* (1756, edited by Sir David Brewster in 1811): and *Select Mechanical Exercises, with a Short Account of the Life of the Author, written by himself* (1773). This autobiography is included in an *Extended Life* by E. Henderson, LL.D. (1st ed. 1867, 2d 1870), which also contains a full description of Ferguson's principal inventions, accompanied with illustrations. See also *The Story of the Peasant-Boy Philosopher*, by Henry Mayhew (1857).

FERGUSSON, Robert (1750–1774), one of the minor poets of Scotland, owes his chief fame to the fact that he was, in a very special sense, the precursor of Burns. He was the youngest of three sons of William Fergusson, a man of superior intelligence, who removed from Aberdeen to Edinburgh in 1746, and there ultimately found employment with the British Linen Company as accountant. Robert was born 17th October, 1750, and grew up a delicate youth, with a nervous susceptibility which increased with years, and unfitted him for the prosaic duties of daily life. His health did not admit of his being sent to school till his sixth year; but both there and at the university of St. Andrews he manifested great quickness, though accompanied by an impulsive fickleness not unfrequently characteristic of the poetical temperament. Among his fellow students he was distinguished for his vivacity and humor. His conversation was singularly fascinating, his powers of mimicry were great, and he sang Scottish songs with fine effect. In one of his frolics he undertook for a wager to play the part of a ballad singer; and, in suitable disguise, furnished with a large bundle of ballads, he disposed of the whole, while he attracted the crowd by his spirited rendering of popular songs. Hence, both at college and in subsequent years, his company was sought after; and in an age when the convivial habits of society were under little restraint, he was exposed to temptations in all respects prejudicial to him. His father died while he was still at college; but a bursary which he held enabled him to complete his four years of study. The loss of his father was nevertheless an irreparable one at the most critical stage of life. His studies appear to have been subsequently pursued in a desultory fashion. He abandoned all thought of the clerical profession for which he had been preparing, and returned to his widowed mother without any definite plan or prospect for life. While still at college he had made more than one attempt at dramatic composition, and wrote two acts of a tragedy, of which the hero of Scottish romance, Sir William Wallace, was the central figure. But in the desultory efforts of his erratic muse there is no indication of dramatic power. The sprightly gayety which made him so covetable a companion inspired his best poems, which are more noticeable for their graphic humor than for tenderness or depth of feeling.

After a brief sojourn with a maternal uncle at Aberdeen, Fergusson returned to Edinburgh, and ere long obtained employment as copying clerk in a lawyer's office. In this humble occupation he passed the remainder of his brief life, relieving the irksome drudgery by poetical composition, and by evenings passed in the convivial gatherings which then formed a peculiar feature of the social life of Edinburgh. He was a member of one of its most noted clubs, celebrated by him in his poem of *Auld Reekie*. "The Knights of the Cape," as they dubbed themselves, were wont to assemble at a tavern in Craig's Close in the vicinity of the Cross; each member had a name and character assigned to him, which he was required to maintain at all gatherings of the order. David Herd, the editor of what Scott styled the first classic edition of Scottish song, was sovereign of the Cape when Fergusson was dubbed a knight of the order, with the title of *Sir Precentor* in allusion to his fine voice. Alexander Runciman, the historical painter, his pupil Jacob More, and Sir Henry Raeburn were all members. The old minute books of the club abound with pencilled sketches by them, one of the most interesting of which, ascribed to Runciman's pencil, is a sketch of Fergusson in his character of *Sir Precentor*.

In the case of Fergusson, as in that of Burns, critical censors have been too apt to ascribe to them excesses of a wholly exceptional nature; whereas they only conformed to the habits of society at a time when clergymen, judges, and men of all ranks habitually frequented the tavern, and sought intellectual as well as social pleasures in convivial clubs. In such assemblies Fergusson appears to have been the life of the company. In a letter addressed to Burns, Mr. Peter Stuart, then editor of the *Morning Post*, refers to Fergusson as his "inestimable friend," and bears testimony to the fascinating social attractions of his society. "There was," he says, "such a richness of conversation, such a plenitude of fancy. . . . His manner was so felicitous, that he enraptured every person around him, and infused into the hearts of the young and old the spirit and animation which operated on his own mind." In person he is described as of a slender, handsome figure, his forehead high, his countenance open and pleasing, though somewhat effeminate, and characterized by extreme pallor, but kindled into life by the animation of his large black eyes, whenever he became interested in the conversation. His light brown hair was worn unpowdered, with long waving curls on each side of the head, and tied into a queue behind with a black silk riband.

From time to time Fergusson contributed to Ruddiman's *Weekly Magazine* grave and humorous pieces, both in English and in the Scottish dialect; but in 1773, when he was in his twenty-fourth year, his poems were collected and published in a volume. The event is not without its significance in English literature. Robert Burns was then in his fifteenth year. The volume ere long came under his notice, and the generous poet made no stinted acknowledgment of all that he owed to his predecessor. But ere such appreciative recognition could be rendered, its unhappy author had died in a maniac's cell. A fall, by which his head was severely injured, greatly aggravated symptoms of mental aberration, from which he had seemed to be recovering; and after about two months' confinement in the old Darien House,—then the only public asylum in Edinburgh,—the poet died on the 16th October, 1774, within one day of completing his twenty-fourth year.

The influence of Fergusson's writings on the Ayrshire poet is undoubted. He is thus apostrophized by Burns:—

> "Oh, thou my elder brother in misfortune,
> By far my elder brother in the muses,
> With tears I pity thy unhappy fate!"

His *Leith Races* unquestionably supplied the model for the *Holy Fair*. Not only is the stanza the same, but the Mirth who plays the part of conductor to Fergusson, and the Fun who renders a like service to Burns, are manifestly conceived on the same model, and even in part in the same terms. *The mutual complaint of Plainstanes and Causey* probably suggested *The Brigs of Ayr*; *On seeing a Butterfly in the Street* has reflections in it which strikingly correspond with *To a Mouse*, one of the most exquisite of all Burns's minor poems; nor will a comparison of *The Farmer's Ingle* of the elder poet with *The Cottar's Saturday Night* admit of doubt as to the influence of the city-bred poet's muse on that exquisite picturing of homely peasant life. But the Ayrshire poet was himself the first to render a generous tribute to the merits of Fergusson. On his visit to Edinburgh in 1787 he sought out, not without difficulty, the nameless grave mound of the poet, and forthwith petitioned the authorities of the Canongate burying ground for permission to erect the memorial stone which still enables the visitor to identify the poet's grave. The inscription on the stone is as follows:—

> "Here lies Robert Fergusson, Poet.
> Born September 5th, 1751—Died 16th October, 1774.
> No sculptured marble here, nor pompous lay,
> 'No storied urn, nor animated bust;'
> This simple stone directs pale Scotia's way
> To pour her sorrows o'er her poet's dust."

On the reverse of the stone is this record of its origin:—"By special grant of the managers to Robert Burns, who erected this stone, this burial-place is to remain for ever sacred to the memory of Robert Fergusson." The simple stone has since been rescued from decay, and inserted in a monumental structure of a more ornate character. The date assigned as that of his birth differs, as will be seen, from the one given above, which rests on the authority of his younger sister, Margaret, the wife of Mr. Alexander Duval, purser in the royal navy. According to her statement, the birthday of the poet's elder sister Barbara had been assigned by mistake to him.

The first edition of Fergusson's poems was published by Ruddiman, at Edinburgh, in 1773, and a supplement, containing additional poems, in 1779. A second edition appeared in 1785, and another in 1807, with a biographical sketch by Alexander Peterkin. A life of Fergusson is included in Dr. David Irving's *Lives of the Scottish Poets;* and the chief points in various biographical sketches are embodied in Dr. Robert Chambers's article in his *Lives of Illustrious and Distinguished Scotsmen.* (D. W.)

FERGUSSON, SIR WILLIAM (1808–1877), Baronet, an eminent surgeon, the son of James Fergusson of Lochmaben, Dumfriesshire, was born at Prestonpans, East Lothian, 20th March, 1808. After receiving his early education at Lochmaben and the High School of Edinburgh, he entered the university of Edinburgh with the view of studying law, but soon afterwards abandoned his intention, and became a pupil of Robert Knox the celebrated anatomist. At the age of twenty he became a licentiate of the College of Surgeons, and he was elected a fellow in the following year. The ingenious fittings of a dissecting case which he had constructed by his own mechanical skill having attracted the attention of Knox, the latter engaged him as his demonstrator. While occupied in teaching anatomy he devoted his chief attention, under the direction of Knox, to the improvement of his surgical skill. In 1831 he became an extramural lecturer on surgery, and in 1836 he succeeded Liston as surgeon to the Royal Infirmary. In 1840 he was appointed professor of surgery in King's College, London, and surgeon to King's College Hospital. At first he acquired a practice in London only slowly, but after the deaths of the two Coopers and of Liston he soon held an unrivalled position in his own department. In 1849 he was appointed surgeon-in-ordinary to the Prince Consort, in 1855 surgeon-extraordinary to the Queen, and in 1860 sergeant-surgeon to the Queen. He was a fellow of the Royal Societies of Edinburgh and London, and of various medical societies. In 1865 he was created a baronet. He died at his Scottish residence in Peeblesshire, February 10, 1877. As a surgeon Fergusson's greatest merit is that of having introduced the practice of "conservative surgery," in many cases of diseased joints which before his time were treated by amputation. He made his diagnosis with almost intuitive certainty; and as an operator he was characterized by self-possession in the most critical circumstances, minute attention to details, and great refinement of touch, and relied more on his mechanical dexterity than on complicated instruments. Sir William Fergusson is the author of *The Progress of Anatomy and Surgery in the Nineteenth Century* (1867), and of a work on *Practical Surgery* (1st ed. 1842) which has a high reputation as a text-book.

FERID-EDDIN-ATHAR (1119–1229), or **FARID UDDIN ATTAR**, a Persian poet and mystic, was born at Kedken, near Nishapur, 513 A.H. (1119 A.D.), and was put to death 627 A.H. (1229 A.D.), thus having reached the age of 110 years. His real name was Muhammed ben Ibrahim, and Ferid Eddin was simply an honorable title equivalent to Pearl of Religion. He followed for a time his father's profession of druggist or perfumer, and hence the name of Athar or Attar, which he afterwards employed as his poetical designation. According to the account of Doulat Shah, his interest in the great mystery of the higher life of man was awakened in the following way. One day a wondering fakir gazed sadly into his shop, and, when ordered to be gone, replied: "It is nothing for me to go; but I grieve for thee, O druggist, for how wilt thou be able to think of death, and leave all these goods of thine behind thee?" The word was in season; and Muhammed ben Ibrahim the druggist soon gave up his shop and began to study the mystic theosophy of the Sufis under Sheikh Rekenuddin. So thoroughly did he enter into the spirit of that religion that he was before long recognized as one of its principal representatives. He visited Mecca, and on his return was invested with the Sufi mantle by Sheikh Majduddin of Baghdad. The greater portion of his life was spent in the town of Shadyakh, but he is not unfrequently named Nishapuri, after the city of his boyhood and youth. The story of his death is a strange one. Captured by a soldier of Jenghiz Khan, he was about to be sold for a thousand dirhems, when he advised his captor to keep him, as doubtless a larger offer would yet be made; but when the second bidder said he would give a bag of horse fodder for the old man, he asserted that he was worth no more, and had better be sold. The soldier, irritated at the loss of the first offer, immediately slew him. A noble tomb was erected over his grave at Shadyakh, and the spot acquired a reputation for sanctity. Ferid Eddin was a voluminous writer, and has left no fewer than 120,000 couplets of poetry, though in his later years he carried his asceticism so far as to deny himself the pleasures of poetical composition. His most famous work is the *Mantic Uttuir*, or language of birds, an allegorical poem containing a complete survey of the life and doctrine of the Sufis. It is extremely popular among Mahometans both of the Sunite and Shiite sects, and the manuscript copies are consequently very numerous. The birds, according to the poet, were tired of a republican constitution, and longed for a king. As the lapwing, having guided Solomon through the desert, best knew what a king should be, he was asked whom they should choose. The Simorg in the Caucasus, was his reply. But the way to the Caucasus was long and dangerous, and most of the birds excused themselves from the enterprise. A few, however, set out; but by the time they reached the great king's court, their number was reduced to thirty. The thirty birds (*sî morg*), wing-weary and hunger-stricken, at length gained access to their chosen monarch the Simorg; but only to find that they strangely lost their identity in his presence—that they are he, and he is they. In such strange fashion does the poet image forth the search of the human soul after absorption into the divine.

The text of the *Mantic Uttair* was published by Garcin de Tassy in 1857; a summary of its contents by the same Orientalist appeared in the *Revue Contemporaine*, t. xxiv., and was reprinted as *La poésie philosophique et religieuse chez les Persans*, 1856; and this was succeeded by a complete translation in 1860. Among Ferid-Eddin's other works may be mentioned his *Pend Nameh*, or Book of Reflection, of which a translation by Silvestre de Sacy appeared in *Les mines de l'Orient*, vol. ii.: *Bulbul Nameh*, or Book of the Nightingale; *Wasalet Nameh*, or Book of Conjunctions; *Khusru va Gul*, the King and the Rose; and *Tezkiret al Aulia*. See Sir Gore Ouseley, *Biographical Notices of Persian Poets*, 1846; Von Hammer Purgstall, *Geschichte der schönen Redekünste Persiens*, p. 140; *The Oriental Collections*, vol. ii., 1798; Palmer, *History of Sufiism*.

FERISHTA, MOHAMMED KASIM, a celebrated Persian historian, was born about 1570, at Astrabad, on the shores of the Caspian Sea. While he was still a child his father was summoned away from his native country into Hindustan, where he held high office in the Deccan; and by his influence the young Ferishta received court promotion. In 1589 Ferishta removed to Bejapore, where he spent the remainder of his life under the immediate protection of the Shah Ibrahim Adil II., who engaged him to write a history of India. At the court of this monarch he died about 1611. In the introduction to his work a *résumé* is given of the history of Hindustan prior to the times of the Mahometan conquest, and also of the victorious progress of the Arabs through the East. The first ten books are each occupied with a history of the kings of one of the provinces; the eleventh book gives an account of the Mussulmans of Malabar; the twelfth a history of the Mussulman saints of India; and the conclusion treats of the geography and climate of India. Ferishta is reputed one of the most trustworthy of the Oriental historians, and his work still maintains a high place as an authority. Several portions of it have been translated into English; but the best as well as the most complete translation is that published by General Briggs under the title of *The History of the Rise of the Mahometan Power in India* (London, 1829, 4 vols. 8vo). Several additions have been made by Briggs to the original work of Ferishta, but he has omitted the whole of the twelfth book, and various other passages which had been omitted in the copy from which he translated.

FERMANAGH, an inland county in the province of Ulster, Ireland, extending from 54° 7′ to 54° 40′ N. lat., and from 7° 1′ to 8° 5′ W. long., is bounded on the N.W. by Donegal, on the N.E. by Tyrone, on the E. by Monaghan, and on the S.W. by Cavan and Leitrim. Its greatest length N.W. and S.E. is 45 miles; its greatest breadth N.E. and S.W. is 29 miles. The area extends to 457,369 statute acres, or 714½ square miles, of which 106,530 acres are under tillage, 243,251 in pasture, 5909 in plantations, 55,248 in waste, bog, mountain, etc., and 46,431 under water. The county is divided into eight baronies: viz., Clanawley, Clankelly, Coole, Knockninny, Lurg, Magheraboy, Magherastephana, and Tirkennedy; and these are subdivided into 23 parishes, and 2183 townlands.

The chief town in Fermanagh is Enniskillen, population (1871) 5836. The only other towns of any importance are —Lisnaskea (857), Irvinestown, formerly Lowtherstown (787), Maguire's Bridge (685), Tempo (460), Newtownbutler (418), Brookborough (390), Rosslea (371), Ederney (332), Belleek (327), Derrygonnelly (302), Kesh (296), in all of which fairs are held and post-offices established. The Irish North-western division of the Great Northern Railway passes through the most populous portion of the county, one branch connecting Enniskillen with Clones, another connecting Enniskillen with Londonderry, *via* Omagh, and a third connecting Enniskillen with Bundoran.

Physical Features.—Fermanagh is situated mostly in the basin of the Erne, which divides the county into two nearly equal sections. It presents a hilly, and in many parts a somewhat sterile appearance, though in the main, and especially in the neighborhood of Lough Erne, it is picturesque and attractive. The climate though moist is healthy, and the people generally are tall and robust. The chief mountains are Cuilcagh (partly in Leitrim and Cavan) 2188 feet high, Belmore 1312 feet, Glenkeel 1223, North Shean 1135, Tappahan 1110, Carnmore 1034. Tossett or Toppid and Turaw mountains command extensive prospects, and form striking features in the scenery of the county. But the most distinguishing feature of Fermanagh consists in the great extent of its surface being occupied by the Upper and Lower Loughs Erne, which stretch for 45 miles from S.E. to N.W. These lakes are formed by the expansion of the river Erne, which enters the county from Cavan at Wattle Bridge, and spreads out its waters in the Upper Lough, broken by innumerable islets. Contracting itself again, the river flows in a meandering course to the town of Enniskillen, where it expands itself once more in the Lower Lough, which extends in a N.W. direction for about 20 miles, till the river again issues from it a mile above Belleek. Of the two loughs the lower and larger one is most famed for its picturesque scenery. Both are dotted with many islands, the number of which has been stated as high as 199. The largest islands are Boa (or "*Cow*"), Ennismacsaint, Devenish, Eagle, Innisnakill Gully, Cor, Ferney, Herring, Innismore, and Bellisle. It is navigable throughout, during the winter season, a small steamer plying between Enniskillen and Belleek. The other lakes next in size are Loughs Melvin and Macnean on the border of Leitrim, and draining into the Drowes river. The chief river is the Erne, which, rising in Cavan, passes through Belturbet, Lough Erne, and Belleek on its way to the Atlantic, into which it descends at Ballyshannon. At Belleek it forms a considerable waterfall, well known to sportsmen for its good salmon-fishing. There are several mineral springs in the county, some of them chalybeate, others sulphureous. At Belcoo, near Enniskillen, there is a famous well called Daragh Phadric, held in repute by the peasantry for its cure of paralytic and other diseases; and four miles N.W. of the same town, at a place called "the Daughton," are natural caves of considerable size. The geological formation of the county may be described as consisting mainly of secondary limestone and yellow sandstone. In the former organic remains are plentiful, some fine specimens of encrinites being easily obtainable. A brown marble excavated at Florence Court is beautifully veined, and susceptible of a splendid polish. Gray marble has been found in the parish of Killasher. Iron and coal have also been traced in various places, but only in small quantities. The best iron ore mine is at Belleek.

Industries—Agriculture, etc.—With the exception of the pottery works at Belleek, Fermanagh cannot boast of any distinguishing manufactures. It is chiefly an agricultural county. Of the arable land about the one-half is devoted to pasturage. Oats and potatoes are the crops most extensively cultivated. The next in order are flax, turnips, wheat, barley, rye, beans, and pease. The following table shows the number of acres under the different crops during the years 1874 and 1877:—

	Meadow and Clover.	Oats.	Potatoes.	Flax.	Turnips.	Wheat.	Barley, etc.	Beans and Pease.	Other Green Crops.	Total.
1874	54,566	24,437	16,811	2526	3330	629	183	27	1936	104,345
1877	53,691	25,512	17,285	4183	3844	333	252	92	2131	107,323

The live stock (horses, cows, sheep, etc.) in the county was valued in the census of 1871 at £839,899, but this estimate was on the basis of the values fixed by the census commissioners of 1841, and is therefore much below the actual present worth, which is probably £1,500,000. From statistics prepared specially for Thom's *Almanac* for 1877, it is estimated at £1,354,379. The number of live stock in Fermanagh given in the registrar-general's annual returns during the years 1874 and 1877 is as follows:—

	Horses and Mules.	Asses.	Cows under one year.	Cows one and under two years.	Cows two years and upwards.	Milch cows	Total of Cows.	Sheep.	Pigs.	Goats.	Poultry.
1874	6781	4196	25,556	14,965	15,813	43,548	99,882	13,718	17,304	3818	313,228
1877	7373	4189	23,918	14,708	14,243	43,891	96,760	11,696	26,649	4634	353,452

The county in 1873 was divided among 707 proprietors, of whom 130 owned less than one acre each, or 19 per cent.,—the proportion for all Ulster being 48 per cent. The average extent of each holding was 586 acres, that of Ulster being 239 acres. The total annual rental of the land amounted to £234,634, or 11s. 5½d. per acre—that of Ulster 15s. 8¼d. More than half the whole county was in possession of ten proprietors, namely,—Marquis of Ely, Ely Lodge, 34,879 acres; Earl of Erne, Crom Castle, 31,389; Earl of Enniskillen, Florence Court, 29,635; Sir V. H. Brooke, Bart., Colebrook Park, 27,994; Mervyn Archdall, Castle Archdall, 27,410; John Madden, Roselea Manor, 14,074; J. G. Irvine, Killadeas, 11,388; J. G. Porter's representatives, 11,015; Church Temporalities Commissioners, 10,357; and Hugh de Fellenberg Montgomery, 7996.

Education, etc.—According to the census of 1871, the number of persons in the county over five years of age who could read and write was 41,226; 18,349 could read but could not write, and 22,758 could neither read nor write. There were 10 persons who spoke Irish only, and 349 who spoke both Irish and English. There were two superior schools, having a total of 94 pupils in attendance, all Protestants. On the 31st December, 1876, there were on the rolls of the national schools 16,640 pupils, of whom 9720 were Roman Catholics, 6321 Protestant Episcopalians, 278 Presbyterians, and 321 of other persuasions. At the same date at the Enniskillen model school there were 339 pupils on the rolls, of whom 229 were Protestant Episcopalians, 33 Presbyterians, 18 Roman Catholics, and 59 of other persuasions. In Fermanagh there are neither reformatory nor industrial schools.

Administration, etc.—Fermanagh returns three members to parliament—two for the county, and one for the borough of Enniskillen. The assizes are held at Enniskillen, quarter sessions at Enniskillen and Newtownbutler, and petty sessions at eleven places throughout the county. Fermanagh is within the Belfast military district. The barrack stations are at Enniskillen and Belleek. Ecclesiastically it belongs for the most part to the diocese of Clogher. The county jail and the county infirmary are at Enniskillen; but the district lunatic asylum is at Omagh (in Tyrone), serving for the two counties, Fermanagh and Tyrone. The poor law union workhouses for the county are at Enniskillen, Irvinestown, and Lisnaskea.

Population.—The population of Fermanagh steadily increased up till the year 1841. The famine and subsequent emigration intervening between that year and the next parliamentary census (1851), the population showed a decrease at the latter date of about 25 per cent., and since 1851 the decrease has continued. The exact decrease during the 30 years 1841 to 1871 is 40·69 per cent. In 1841 the population was 156,481; in 1851, 116,047; in 1861, 105,768; in 1871, 92,794; and on the 31st December, 1876, it was estimated at 91,188. From the 1st May, 1851, to 31st December, 1876, the total number of emigrants from Fermanagh was 34,776, or an average of 1337 per annum. In 1871 55 per cent. of the population were returned as Catholics.

History and Antiquities.—According to Ptolemy, the aborigines of this county were the *Erdini*. By the ancient Irish it was called *Feor-magh-Eanagh*, or the "country of the lakes" (lit. "the mountain-valley marsh district"); and also *Magh-uire*, or "the country of the waters." It was divided into two large portions—the one called Targoll, the other Rosgoll. The latter was occupied by the *Guarii*, the ancestors of the MacGuires or Maguires, a name still very common in the district. This tribe or family was so influential that for centuries the county was called after them Maguire's Country, and one of the towns still existing bears their name, Maguire's Bridge. Fermanagh was one of the six counties which reverted to the crown at the time of the flight of the earls of Tyrone and Tyrconnell, and which were included in the well-known scheme of colonization of James I., the Plantation of Ulster. Among the principal Scotch and English settlers at the period of the Plantation were Sir Stephen Butler, Sir Wm. Cole, John Archdall, and Sir Gerard Lowther, from whom some of the towns and villages in the county derived their names, and whose descendants form the leading gentry to the present day. During the revolution of 1688 Fermanagh rendered signal service to the cause of William III. by the gallant stand which its yeomen made against the Irish army, and their descendants possess so much of the military spirit of their forefathers as to make the title "Fermanagh men" still synonymous with bravery and loyalty to the constitution. In the year 1689 battles were fought between William III.'s army and the Irish under Macarthy (for James II.) at Lisnaskea (26th July) and Newtownbutler (30th July). The chief place of interest to the antiquary is Devenish Isle in Lough Erne, about 2½ miles N.W. from Enniskillen. It contains about 80 acres of very fertile pasture land, and has long been celebrated for its romantic situation and ecclesiastical ruins. Near the remains of the abbey of St. Mary, founded in the 6th century by St. Laserian (called also Molaisse or Molush), is one of the best specimens of Ireland's round towers. It is 82 feet high and 49 in circumference, with an ingeniously constructed conical roof. About half a century ago it was carefully repaired, and is now in excellent preservation. Pursuant to "The Irish Church Act, 1869," both the round tower and the abbey have been vested in the secretary of the commissioners of public works in Ireland to be preserved as national monuments. In various places throughout the county may be seen the ruins of several ancient castles, Danish raths, and tumuli, in which last have been found at times urns and stone coffins. At Wattle Bridge, near Newtownbutler, are the remains of a Druidical temple. (W. E. C.)

FERMAT, Pierre de (1601–1665), a famous mathematician, was born at Beaumont-de-Lomagne near Montauban. While still young he, along with Pascal, made some discoveries in regard to the properties of numbers, on which he afterwards built his method of calculating probabilities. He discovered a simpler method of quadrating parabolas than that of Archimedes, and a method of finding the greatest and smallest ordinates of crooked lines analogous to that of the then unknown differential calculus. His method of maxima and minima brought him into conflict with Descartes, but the dispute was due chiefly to a want of explicitness in the statement of Fermat. Fermat was for some time councillor for the parliament of Toulouse, and in the discharge of the duties of that office he was distinguished both for legal knowledge and for strict integrity of conduct. Though the sciences were the principal objects of his private studies, he was also an accomplished general scholar and an excellent linguist. He died at Toulouse in 1665. He left a son, Samuel de Fermat, who was a man of some learning, and published translations of several Greek authors.

The *Opera Mathematica* of Fermat were published at Toulouse, in 2 vols. folio, 1670 and 1679; they have now become very scarce. The first contains the "Arithmetic of Diophantus," with notes and additions. The second includes a "Method for the Quadrature of Parabolas," and a treatise "on Maxima and Minima, on Tangents, and on Centres of Gravity," containing the same solutions of a variety of problems as were afterwards incorporated into the more extensive method of fluxions by Newton and Leibnitz. In the same volume are treatises on "Geometric Loci, or Spherical Tangencies," and on the "Rectification of Curves," besides a restoration of "Apollonius's Plane Loci," together with the author's correspondence addressed to Descartes, Pascal, Roberval, Huygens, and others.

FERMENTATION, a chemical term, which, in accordance with its derivation from *fervere* (to boil), was originally applied indiscriminately to all chemical changes involving the effervescence of a liquid, but which, in its modern acceptation, has in itself nothing at all to do with effervescence, being used to designate a peculiar class of metamorphoses which certain complex organic materials are liable to, and of which the well-known change which grape juice undergoes when it "ferments" into wine, the souring of wine or milk, and the putrefaction of animal or vegetable matter may be cited as familiar examples.

What in all these and similar processes strikes the ordinary observer as something particularly characteristic is their spontaneity: sweet milk turns sour, grape juice passes into wine, wine into vinegar, vinegar into a foul insipid fluid—without the application or addition from without of any agent or reagent; but the "spontaneity" in the eyes of the chemical investigator does not go far. All chemical reactions are spontaneous; and wherever a case occurs of two things acting upon each other, it makes no difference whether one of them be added, say, to the solution of the other from a bottle, or whether it were present in the liquid from the first. What caused chemists to group together fermentative changes as a class of phenomena different from ordinary reactions was the fact that wherever they succeeded in reducing the phenomena to a degree of simplicity sufficient for translating the respective reaction into an equation, this equation, though perfectly correct in the sense of chemical arithmetic, appeared to assert something which ran contrary to the known chemical tendencies of the substances concerned. To explain this by an example, let us take the case of the souring of milk, a fermentation which, when stripped of what, from the purely chemical standpoint, would appear unessential, involves only one reaction, which consists in this, that the milk sugar of the milk, by a mere rearrangement of its ultimate ingredients, passes into lactic acid, according to the equation

$$\underset{\text{Milk Sugar.}}{C_{12}H_{22}O_{11}.H_2O} = \underset{\text{Lactic Acid.}}{4C_3H_6O_3}$$

Now, this in itself is nothing exceptional. A solution of cyanate of ammonia ($NCOH.NH_3$) is no sooner prepared than it passes into one of urea $CO(NH_2)_2$; cyanic acid, ($NCHO$) when left to itself, soon passes into cyamelide, just as the milk sugar of the milk passes into lactic acid. But there is this great difference, that this latter change cannot be realized, under any known set of conditions, in a solution of pure milk sugar in pure water. And so it is in all other analogous cases. But this comes to the same as saying that fermentations, as a class of chemical reactions, are characteristically *non-spontaneous*, and consequently must be caused by reagents, although these reagents have no place in the mere balance-sheet of the reaction. In fact, experience shows that no fermentable chemical species will ferment except in presence of water, and unless it be kept by means of that water in direct contact with some specific "ferment," which, although it contributes nothing to the substance of the products which figure in the equation, nevertheless induces the reaction "by its presence," as the phrase goes. The presence alone, of course, will not do. It is simply inconceivable that a reagent should act chemically unless it were itself in a state of chemical change, although this change may be (and with some ferments probably is) a cycle of changes which always brings back the reagent to its original condition.

Of all the multitude of chemical processes which fall under our heading, vinous fermentation is the one which is by far the best known and most satisfactorily explained; and it is scarcely an exaggeration to say that the present science of the whole subject has been evolved from the study of that particular case. Hence the best course that we can adopt in this article is to begin with a popular exposition of the growth of our knowledge of vinous fermentation, which may familiarize even the general reader with the main points of the whole subject, and then to append a short epitome of the facts concerning the more important of the different fermentative changes..

Vinous fermentation means that peculiar change which all native sacchariferous juices are liable to undergo when left to themselves at the ordinary temperature, and which results in the formation of some kind of "wine." The general course of the phenomena being the same in all cases, we shall assume in what follows that it is grape juice we have to deal with. Such juice, as is well known, when recently prepared, forms an intensely sweet yellowish liquid, which, if it is not so by nature, may be rendered perfectly limpid and transparent by filtration through bibulous paper. Grape juice when left to itself, after having been thus clarified, may remain unchanged for an indefinite time, but when mixed with ever so little of unfiltered juice, it is sure sooner or later to undergo a change, which manifests itself in the appearance of a turbidity in the liquid. This turbidity is owing to two causes, namely, (1) the evolution of carbonic acid, and (2) the formation within the liquid of a finely-divided solid, which through the gas evolution, is partly kept in suspension, partly thrown up to the surface as a scum, and which is known by the name of "yeast." The process, from an almost imperceptible beginning, gradually develops into a more and more vivid effervescence (which not unfrequently assumes the character of a violent ebullition), the yeast at the same time becoming more and more abundant; and when a sufficient quantity of "must" is operated on, the temperature of the fermenting mass soon rises perceptibly beyond that of the surrounding air. Sooner or later of course the reaction reaches a climax, from which onwards it gradually loses in intensity until at last it dies out. The yeast then settles down as a slimy deposit, above which there is left a clear yellow liquid, which, instead of the originally sweet, now has a "vinous" taste, and is endowed with that well-known physiological action characteristic of "fermented liquors." Chemically the change in the nature of the liquid consists substantially in this, that the sugar has mostly or perhaps wholly disappeared, and given place to a corresponding percentage of a volatile inflammable liquid called *alcohol*. To any one who has a real knowledge of these facts it must necessarily suggest itself as a highly probable hypothesis that it is the destroyed sugar which has furnished the ingredients for the formation of the carbonic acid and of the alcohol, while most persons will be inclined to look upon the yeast as a bye product formed from the secondary constituents of the juices.

This view, which is endorsed substantially by our present knowledge of the matter, one is inclined to think should have forced itself even at the earliest times upon the minds of all who reasoned on the process as a material metamorphosis. But although now-a-days everybody looks almost instinctively upon chemical reactions as nothing more than rearrangements of the ultimate ingredients of the bodies concerned, which ingredients in themselves are as a matter of course, assumed to be uncreatable and indestructible, we must not forget that this notion dates back only to the time of Boyle, and that is not much longer than air, and gases generally, have been recognized as species of weighable matter. Hence for many centuries the carbonic acid was not recognized even by chemists as forming a factor in the chemical reaction; it was known only as an effervescence, a phenomenon pure and simple, not as a substance. Van Helmont (born in 1577) was the first to show that the gas which rises from fermenting "must" is different from air, and identical with the *gas sylvestre* formed in the combustion of charcoal and in the calcination of limestone. Long before Van Helmont's time, the "alcohol" had been recognized as a definite kind of matter. The art of concentrating the intoxicating principle of wine by distillation, in fact, was known and practised industrially in the 8th century; and nobody could practise this art without finding out that a spirit can be strengthened by repeated distillations, with elimination of water. But it was only about the 13th century that chemists learned to remove all the water from spirits of wine, and thus to prepare "absolute," that is, pure alcohol.

Ordinary cane sugar and honey were known to the ancients; and chemists from the earliest times took it for granted that these two substances and the sweet principles in fruit juices must be closely related to one another. It is also an old experience that cane sugar or honey when added to grape juice ferments with the sugar originally present in the latter. But the idea that the differences between the several kinds of sugar are owing to the existence of a number of distinct chemical species is comparatively new, and it is only in the course of the present century that the problem of isolating these several species has been satisfactorily solved.

But to return to our proposition; plausible as it is as an hypothesis, to be able to test even its potential correctness, we must know the weights of alcohol and carbonic acid produced in the fermentation of a given weight of sugar, and know also the quantitative elementary compositions of the three substances. Lavoisier was the first to make experiments for supplying these data, which, in fact, could not reasonably have been attempted by anybody before him, as it is he to whom we owe our knowledge of the qualitative elementary composition of the substances concerned, and indeed of organic substances generally.

Before giving his numbers, it may be stated that he regarded acetic acid (a small quantity of which is present in most wines) as, like alcohol and carbonic acid, a constant product of vinous fermentation. According to Lavoisier, 95·9 parts of cane sugar in fermenting yield

Alcohol	57·7
Carbonic acid	35·3
Acetic acid	2·5
	95·5

And according to his elementary analysis of the substances, the proportions by weight are—

	Carbon.	Hydrogen.	Oxygen.
In 35·3 of carbonic acid	9·9	nil	25·4
In 57·7 of alcohol	16·7	9·6	31·4
In 2·5 of acetic acid	0·6	0·2	1·7
	27·2	9·8	58·5
In 95·9 of sugar	26·8	7·7	61·4

From these numbers Lavoisier concluded (and he was quite justified in doing so, considering the imperfections of his methods of analysis) that sugar in fermenting simply breaks up into these three substances, without any access of matter from without. But if he thus managed to arrive at what we now know to be a substantially correct conclusion, this can be credited to him (if at all) only as a happy stroke of divinatory genius, as his numbers are all of them monstrously incorrect, the errors going far beyond what even, with his necessarily imperfect method, could be tolerated as "observational errors." Lavoisier's numbers were subsequently corrected by Gay-Lussac according to his own analyses of sugar, alcohol, and carbonic acid. His results, which have remained unimpugned to the present day, may be stated, with substantial correctness, to have been as follows:—

In vinous fermentation very nearly one-third of the carbon goes off as carbonic acid, while the rest passes into the alcohol; and reducing to 1, 2, and 3 parts of carbon, we have

	Carbon.		Hydrogen.		Oxygen.		Sum.
In carbonic acid.	1	+	nil	+	2·667	=	3·667
In alcohol	2	+	0·5	+	1·333	=	3·833
Sums	3		0.5		4·0	=	7·5
Found in cane sugar...	3		0·458		3·667	=	7·125

The agreement being by no means satisfactory, Gay-Lussac suspected that his analyses of sugar were infected with unobserved errors, and he corrected his figures so as to make them agree with those given above opposite to "Sums." These values, when measured by the customary units (namely C for twelve parts of carbon, H for one part of hydrogen, O for sixteen parts of oxygen), assign to sugar the very simple formula $C_1H_2O_1$ leading to an equally simple equation for the reaction, which is:—

$$6\times(CH_2O) = C_6H_{12}O_6 = 2C_2H_6O + 2CO_2;$$

i. e., 180 of sugar gives 2 × 46 of alcohol + 2 × 44 of carbonic acid;
or 45 " " 23 " + 22. " "

This equation is still looked upon as substantially correct, though not in Gay-Lussac's sense. It is so, if by sugar we understand either of the two kinds of "glucose" which form the bulk of the sweetening principles in fruit juices, and which are composed according to the formula $C_6H_{12}O_6$. Cane sugar, as Dumas and Boullay showed, really has the composition following from Gay-Lussac's analysis, which, as is easily seen, corresponds to the formula $C_{12}H_{22}O_{11} = 2C_6H_{12}O_6 - H_2O$, where H_2O means the elements of 18 parts of water; and these 18 parts of water, as Dumas and Boullay showed, actually are taken up in the fermentation of $C_{12}H_{22}O_{11} = 324$ parts of cane sugar.

Gay-Lussac's equation being, as we said, only substantially correct, we must now state the qualifications implied. Schmidt of Dorpat found in 1847 that vinous fermentation always results in the formation of small quantities of succinic acid. Guerin Vary showed, by quantitative experiments, that in the fermentation of glucose the alcohol and carbonic acid produced account only for about 96·3 per cent. of the glucose. And the present writer happens to know that a certain German apothecary made the interesting discovery that wines, besides the unfermented remnant of glucose that may be left, may contain an unfermentable sweet principle which he recognized as glycerine. These observations, however, were little heeded until Pasteur, in a now classical memoir, proved that glycerine and succinic acid are constant products of normal vinous fermentation, the correct balance-sheet of the reaction, according to him, being as follows:—100 parts of cane sugar, in fermenting, pass into 105·4 parts of glucose, which then break up, yielding (approximately) of

Alcohol	51·1
Carbonic acid	49·4
Succinic acid	0·7
Glycerine	3·2
Matter passing to the yeast	1·0
Sum	105·4

But even this is not quite an exhaustive statement, a small portion of the sugar always passing into the form of higher alcohols ("fusel-oil") and compound ethers.

Vinous fermentation, then, is a far more complex reaction than Gay-Lussac imagined; but it still remains true that all the products formed are derived from the dissociation of the sugar. What is it that brings about this singular decomposition? We call it a singular reaction, because it is one which sugar has never been seen to undergo when subjected by itself or as an aqueous solution to the action of heat or electricity or any ordinary reagent. And we have theoretical grounds for presuming that the reaction is not likely ever to be realized by some "reagent" that has not yet been tried. According to many experiences, an arithmetically possible reaction is the more likely to be realized the greater the heat evolution which, supposing it were realized, it would involve. Now, the reaction formulated in Gay-Lussac's equation $C_6H_{12}O_6 = 2CO_2 + 2C_2H_6O$, as Professor Dewar pointed out some years ago, supposing dry sugar could be made thus to split up, would yield only an insignificant amount of heat, if any. Actual fermentation does involve a liberation of heat, as we know, but the quantity of heat per unit weight of sugar destroyed, according to Dewar's experiments, amounts only to about 83 heat-units, which can be accounted for as being produced by the hydration of the alcohol formed, and, at any rate, is too small to characterize the decomposition of sugar into carbonic acid and alcohol as being at all of itself a probable reaction. Even the somewhat higher result previously arrived at by Dubrunfaut, namely, 135 heat-units per unit of sugar, cannot affect this conclusion. Before going further let us take an exact survey, from the chemical standpoint, of the conditions which are known to favor or impede the actual process.

(1.) Pure solutions of cane sugar or glucose do not ferment under any circumstances.

(2.) Many kinds of impure sugar solutions, such as grape juice, brewers' wort, etc., do ferment. The range of temperatures most favorable to this process lies between about 20° and 24° C. (or 68° and 75° F.). But even grape juice does not ferment at temperatures lying too close to the freezing-point, nor does it ferment at temperatures exceeding a certain limit, which lies at about 60° C. (140° F.). The most lively fermentation comes to a stop when the liquid is boiled, and, after cooling, it takes a longer or shorter time before it resumes.

(3.) Grape juice which has been strengthened by evaporation or addition of sugar from without, does not ferment, when the ratio of water to sugar falls below a certain limit-value.

(4.) Fermentation is impeded and may be entirely stopped by addition of alcohol. Hence the wines produced from the rich juices of southern grapes always contain unfermented sugar.

(5.) Fermentation may be stopped more or less completely by addition to the liquid of even small quantities of certain reagents called antiseptics. Of these corrosive sublimate (and many other heavy metallic salts), sulphuric acid, sulphurous acid, bisulphide of carbon, and carbolic acid may be mentioned as examples.

(6.) Perfectly pure grape juice does not ferment, unless the process has been started by at least temporary contact with ordinary air. This cardinal fact was discovered by Gay-Lussac in a now classical series of experiments. He caused clean grapes to ascend through the mercury of a large barometer into the Torricellian vacuum, where he crushed them by means of the mercurial column. The juice thus produced and preserved remained unchanged; but the addition to it of ever so small an air-bell (as a rule) induced fermentation, which, when once started, was always found to take care of itself.

(7.) Ordinary vinous fermentation always involves the formation of yeast. This is the most important of positive facts made out.

(8.) The rate at which a fermentation progresses is (in a limited sense) determined by the quantity of yeast present within the liquid.

(9.) Spontaneous fermentation of grape juice is always slow in beginning; addition of yeast from without starts it immediately.

From these facts it is legitimate to conclude that it is the yeast or some constituent of the yeast which somehow or other causes the sugar to break up into alcohol, carbonic acid, glycerine, and succinic acid. But what is the rationale of the action? Chemically speaking, it would appear to be vain to attempt an answer without first knowing what yeast is made of in the chemical sense. Unfortunately the present state of our knowledge on this point is very unsatisfactory. All we know is that yeast is a highly complex mixture of chemical substances which may be arranged under the four heads of—(1) fats (forming about 2 per cent. of the whole); (2) cellulose (about 18 per cent.); (3) nitrogenous substances more or less closely allied to white of egg, some of them soluble, some insoluble in water (about 60 per cent.); (4) incombustible salts, which, when the yeast is burned, remain as "ash" (about 7 per cent.). According to Mitscherlich's analysis, yeast-ash consists mainly of phosphoric acid (54 to 59 per cent.), united with potash (28 to 40 per cent.), magnesia (6 to 8 per cent.), and lime (1 to 4 per cent.). That such a complex mixture should act, chemically, as a whole cannot reasonably be assumed; chemists, accordingly, have always been unanimous in thinking that it is some one constituent or set of constituents of the yeast which constitutes the characteristic reagent in vinous fermentation; but none of them has succeeded in isolating that reagent. The only clue in this respect which we have is an important discovery of Mitscherlich's, who showed that an aqueous extract of yeast, although capable of converting cane sugar into glucose, does not induce fermentation in the glucose formed, whence it at once follows that the ferment must be sought for amongst the insoluble portion of the yeast.

Their non-success in isolating the vinous ferment did not prevent chemists from speculating on its mode of action. Berzelius gave it as his opinion (which was adopted by Mitscherlich and others of the leading chemists) that the action was a purely "catalytic" one. What he meant by this is best explained by an example. Peroxide of hydrogen (a compound of the elements of water and oxygen) is perfectly stable at ordinary temperatures. Add to it a mere speck of platinum black (a peculiar form of finely divided platinum), and it at once breaks up into water and oxygen, the platinum which caused the decomposition remaining unchanged. In an exactly similar manner Berzelius thought the yeast acted upon the sugar, and caused it to break up into alchohol and carbonic acid. The merit of the idea was that it apparently reduced the explanation of a seemingly complex to that of an undoubtedly simpler phenomenon. But unfortunately neither Berzelius nor any of his followers succeeded in proving the objective existence of the analogy by experimental evidence. Hence Berzelius's theory really amounted to no more than showing that vinous fermentation and the "catalytic" reactions of inorganic chemistry were both unexplained phenomena.

Something far more worthy of the name of a theory had been offered 200 years before by Stahl. The originator of the phlogiston theory justly divined that vinous fermentation and putrefaction are phenomena of the same order, and, starting from the well-known infectious nature of the latter, explained both as disturbances in the "molecules" of the fermenting body, brought about by a pre-existing molecular motion. "Ein Körper der in der Faulung begriffen ist bringet in einem anderen von der Faulung annoch befreiten sehr leichtlich die Verderbung zu Wege, ja es kann ein solcher, bereits in innerer Bewegung begriffener Körper einen anderen annoch ruhigen, jedoch zu sothaner Bewegung geneigten sehr leicht in eine solche innere Bewegung hineinreissen."

These ideas of Stahl's, at the time of Berzelius's catalytic theory, had long been forgotten, and they remained lost to science until they were revived and brought into a more definite form by Justus Liebig, who, in a powerful and comprehensive memoir on fermentative changes, which he published in 1848, used them as the basis of a new theory of these phenomena, which justly attracted universal attention, as it—or rather the wonderfully lucid memoir which embodied it—exhibited the subject in a clearer light than anything else that had been said or written on it before. With Liebig as with Stahl, all "fermentations" and "putrefactions" are analogous phenomena. Putrefactions are owing mainly to the inherent instability of the albuminoid constituents of the respective substances in presence of water. So unstable are these albuminoids that even an incipient oxidation (see Gay-Lussac's experiment) may suffice to disturb their chemical equilibrium to such an extent as to cause the whole of the atoms of the mass to gradually rearrange themselves into new products of lesser complexity and consequently higher stability. The decomposition when once started, readily propagates itself through the whole mass, aided as it is by the inherent tendency of the molecule to pass into more highly stable forms, just as a stone which rolls down a hill and strikes other stones on its way causes them roll down likewise. This is so clear and plausible as almost to command assent. It is less easy to agree with Liebig when he tries to explain fermentation, when he says, for instance, that the sugar in grape juice, although not naturally gravitating towards a rearrangement as alcohol plus carbonic acid, is nevertheless caused to undergo this change by its immediate contact with the albuminoids of the juice or yeast, which are in a state of atomic commotion; and it is still less easy to see how such an atomic revolution could progress from sugar to sugar, as he says it may. That the nitrogenous matters of the juice, in all ordinary cases of vinous fermentation, assume the form of yeast, is, according to Liebig, a purely accidental phenomenon, and, if yeast is so characteristically powerful as a ferment, it is so only through its consisting largely of exceptionally unstable albuminoid substances.

Liebig's ideas, more perhaps through the brilliancy of his mode of exposition than the force of his arguments, took firm hold of the scientific mind of the time; amongst chemists at least the general impression was, and it prevailed for a considerable time, that Liebig's theory in a satisfactory manner summed up the whole of the empirical knowledge of the subject—although it totally ignored at least one most important feature in the phenomena which had been brought out and firmly established by Schwann and Cagniard-Latour.

In 1680 a Dutch philosopher, Leuwenhoek, fell upon examining yeast under the microscope, and found it to consist of minute globular or ovoid particles. Microscopes in his time were very imperfect or he would have made a great discovery. Schwann and Cagniard-Latour, who (about 1838, and independently of each other) resumed the old Dutchman's inquiry, used the better instruments of their time, and discovered that Leuwenhoek's globules are membranous bags which exhibit all the morphologic characteristics of vegetable cells, and, like these, when brought under the proper conditions, increase and multiply in the biologic sense. Taking this together with the long-known fact that in vinous fermentation the yeast increases as the process progresses, they naturally concluded that yeast is a species of plant, and that it is the life of that plant which somehow or other causes the chemical change. It is the special merit of Schwann to have adduced powerful experimental evidence in favor of this view. In his case the observations on yeast were incidental only to a more comprehensive investigation, the original aim of which had been to solve the great question of spontaneous generation. Processes of putrefaction having long been known to be invariably accompanied by the formation of vibriones and other microscopic organisms endowed with voluntary motion, he prepared infusions of flesh and other putrescible matters in glass flasks, and, after having hermetically closed these, exposed them for a time to the heat of boiling water, so as to destroy every trace of living germs that might be present. The contents, when preserved in that condition for ever so long, showed no sign of putrefaction or of life of any kind. But when exposed to the air they did putrefy, and soon swarmed with living organisms of various kinds. Obviously it was the air which caused this two-fold change. But then the air which had been shut up with the infusions did not act. This, however, might have been owing to an absorption of the oxygen by the juices. Schwann therefore in another set of experiments, allowed the boiled (and consequently germless) infusions to communicate freely with the atmosphere, in such a manner, however, that no particle of air could enter the flasks without having first passed through a red-hot glass tube, and thus been freed from any germs that might float about in it. In this case the air had fair play, in a chemical sense, but yet not only did no life of any kind make its appearance, but even the chemical changes failed to set in. Exactly similar results were obtained by Schwann in experiments with grape-juice, whether previously mixed or not with yeast. Gay-Lussac's famous experiment failed when the air-bell, before being admitted to the juice, had been heated, and thus freed from living germs. In a few of these experiments, it is true, the results were contradictory to the general evidence afforded by the rest of the work. But Schwann had no doubt in his mind about the close analogy between vinous fermentation and putrefaction; and as the putrefaction experiments had all given one and the same answer, he explained these anomalies as having been caused by unobserved slips in the respective experiments, and did not admit them to invalidate his general proposition that both putrefaction and fermentation are inseparably connected with characteristic biologic phenomena; the less so, as his experiments on the action of certain antiseptics had shown that what is an "antiseptic" to a fermentative change is a poison to the organisms characteristic of the case. Thus, for instance, he found that white arsenic[1] and corrosive sublimate, being poisonous to both plants and animals, stop both putrefaction and fermentation; while extract of nux vomica, being destructive of animal but not of vegetable life, prevents putrefaction, but does not interfere with vinous fermentation. The mechanism of the latter process he imagined to consist probably in this, that the "sugar-fungus" (the yeast) lives at the expense of the nitrogenous matters and of the sugar of the juice, and that those of the elements of these substances which the plant does not assimilate are eliminated chiefly as alcohol. This special theory of Schwann's, as the reader is aware, is not quite correct, but it does not affect his general views on the phenomenon, which were fully confirmed by subsequent investigators. Amongst these we may mention Helmholtz, who showed that oxygen evolved by electrolysis from water does not, like air, induce vinous fermentation. The same observer showed that boiled grape-juice, when tied up in a bladder, does not ferment, even when suspended within a tub full of fermenting juice. The evidence afforded by this experiment was considerably strengthened by Mitscherlich, who proved that even a septum of filter paper effectually stops the propagation of the reaction. More striking still is an experiment which was made many years later by H. Hoffmann. He took a test-tube full of sugar-water, and by a plug of cotton wool inserted within it divided the liquid into two parts. To the upper part he added yeast, which, of course, induced fermentation there; but the change did not propagate itself through the cotton wool to the lower portion. The same material had done good service some years before in the hands of Schröder and Dusch, who proved in 1854, by a most extensive series of experiments, that the something in air which enables it to start fermentative changes in boiled infusions of meat or malt, in grape-juice, etc., can be effectually removed by filtration of the air through cotton wool. It is true the "etc." here does not include milk, which they found to turn sour in filtered as well as in ordinary air, but this exception was subsequently explained away by Pasteur, who found that germs immersed in alkaline liquids may survive temperatures considerably higher than 100° C.

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[1] According to Schutzenberger, who, however, does not quote his authority, arsenious acid does not impede vinous fermentation.

A number of other important researches, which led to substantially similar results, must be passed over here, and may be, because what we have quoted has never been disproved, and is consequently quite sufficient to show that, in the case of vinous fermentation and putrefaction at any rate, those atomic motions, which, according to Liebig, cause the disintegration of the fermenting substances,—if the notion is to be maintained at all,—cannot be admitted to have an existence outside the living bodies of certain organisms characteristic of the respective changes. To any unprejudiced person this would appear to be sound logic; but Liebig did not see it, and for a long time he had the majority of chemists at least on his side. No reasonable person could have denied the irresistible force of the arguments of Schwann and his followers; but these chemists somehow or other managed to ignore the facts, until Pasteur, by means of a most thorough and extensive experimental research (of which the principal portions were published from 1857 to 1861) simply forced the attention of everybody to the physiological side of the subject, and, by absolutely unimpeachable evidence, proved that Schwann's views are substantially correct. Of this investigation it is impossible to speak otherwise than in terms of the highest admiration. Even the purely critical portion of Pasteur's work would be enough to immortalize his name. He did the whole of the work of Schwann and the rest of his predecessors over again, modifying and perfecting the experimental methods, so as to silence any objection or doubt that might possibly be raised, repeating and multiplying his experiments until every proposition was firmly established. But his work was synthetical as well as analytical. Some of his discoveries will be noticed below; suffice it here to mention one of the general results which he arrived at. Vinous fermentation is only one of a number of fermentative changes to which sugar is liable. The same substance sugar, which, when placed under certain conditions, breaks up into alcohol and carbonic acid, under certain other sets of conditions ferments into lactic acid, or through lactic into butyric acid, or into gum plus mannite. This has long been known. What Pasteur showed is that each of these changes is the exclusive function of a certain species (or at least genus) of organism. What the yeast plant is for vinous a certain other organism is for lactic, a third for mannitic, a fourth for butyric fermentation. No two of these species, even if they belong to the same genus, will ever pass into each other. Pasteur arrived at this great generalization by means of his invention of an ingenious method for cultivating pure growths of the several species, so that each of them could be examined separately for its chemical functions. To explain the method, let us suppose we wanted an unmixed growth of the species of yeast-plant called *Saccharomyces cerevisiæ*. The first step of course is to procure a specimen of yeast which, when examined under the microscope, proves a fair approximation to what is wanted. This being done, we place a quantity of brewers' wort in a flask provided with two necks, one long and very narrow and bent like a gas-evolution tube, the other short and wide like the tubulus of a retort. We boil the wort in the flask to kill the germs, and during the boiling close first the tubulus by means of a (germless) glass stopper, then the narrow tube by means of a previously ignited plug of asbestos. We now allow the flask to cool down slowly, and by exposing it for several days to the proper temperature make sure that there is no potential life in our medium. We then, by means of a thin platinum wire, introduce a speck of the yeast through the tubulus, which, of course, is stopped up again without delay. We then place the flask in a chamber kept at the particular temperature which is most favorable to the development of "saccharomyces." The saccharomyces-cells, being in the majority and enjoying a position of advantage, will multiply at a greater rate than the foreign cells, of which many in fact will go to the wall, so that what we ultimately obtain is a closer approximation to pure saccharomyces than the speck of yeast which we used as seed, and which, in general, was already a little better (in all probability) than the bulk of the yeast it came from. Of the relatively pure yeast we now again take a speck and sow it in a fresh supply of germless wort, and so on until the foreign cells can be assumed to be "Darwinized" out of existence. This method of Pasteur's, apart from its scientific value, is of the greatest practical importance; supposing it to be carried out on a large scale—which, in fact, has been done with some measure of success—it will enable the brewer to grow and use pure saccharomyces, and thus to avoid all the many "diseases" which beer, as brewed with ordinary yeast, is liable to.

After Pasteur's researches it became impossible not to admit that those fermentative changes which he investigates are, at least, in a practical sense, physiological and not purely chemical phenomena; but there appears to be no necessity for assuming, as many do, that it is the life of those minute organisms, *qua* life, which directly causes the phenomena. It seems far more rational and philosophic to adopt the view taken by Berthelot and Hoppe-Seyler, who go no further than to admit that those living organisms are the only known sources for the ferments proper, which in themselves are chemical substances pure and simple.

Proceeding now to give a short account of the different fermentative changes, we begin with those that are proved to be functions of purely chemical reagents.

A. *Fermentations proved to be purely chemical reactions.*

These are conveniently arranged according to the respective catalytic agents.

1. *Acids.*—Many organic substances, when boiled with water and a small quantity of sulphuric, muriatic, or other strong mineral acid, undergo hydration and decomposition, or other chemical transmutation, the acid remaining ultimately in its original condition. Thus, under the circumstances named,—

(1.) Cane sugar is "inverted," *i. e.*, converted into dextrose and levulose, thus:

$$C_{12}H_{22}O_{11} + H_2O = C_6H_{12}O_6 + C_6H_{12}O_6.$$

(2.) The same equation applies to the case of milk sugar, one of the products $C_6H_{12}O_6$ in this case being a peculiar substance called "galactose."

(3.) Starch passes into dextrine (a kind of gum) and dextrose, thus:

$$\underset{\text{Starch.}}{C_{24}H_{40}O_{20}} + \underset{\text{Water.}}{3H_2O} = \underset{\text{Dextrine.}}{C_6H_{10}O_5} + \underset{\text{Dextrose.}}{3C_6H_{12}O_6}$$

(4.) Salicine (a bitter principle in willow bark) breaks up into glucose and "saligenine," thus:

$$\underset{\text{Salicine.}}{C_{13}H_{18}O_7} + H_2O = \underset{\text{Glucose.}}{C_6H_{12}O_6} + \underset{\text{Saligenine.}}{C_7H_8O_2}$$

Many other "glucosides" (native substances containing potential glucose) behave in a similar manner. The exact mechanism of these reactions is scarcely understood; pending exact investigations, they may be explained, according to Lyon Playfair, by a tendency of the acid to combine with the elements of one of the products, which tendency, although sufficient to sever these elements from the rest, is defeated ultimately by the stability of the compound formed by their union with one another.

2. *Diastase* is a peculiar substance which is formed in the germination of grain (in malting), and which has the power of converting many times its weight of starch into dextrine and dextrose when made to act on it in the presence of water at about 66° C. Diastase has not yet been isolated in the pure state. In the process referred to it is changed; but it is not known into what.

3. *Emulsine* is a constituent of almonds (both of bitter and sweet), which is known chiefly for its power of decomposing amygdaline (a crystalline substance contained in bitter almonds, and extractable therefrom by alcohol), with formation of bitter-almond oil and glucose, thus:

$$\underset{\text{Amygdaline.}}{C_{20}H_{27}NO_{11}} + 2H_2O = \underset{\text{Glucose.}}{2C_6H_{12}O_6} + \underset{\text{Volatile oil.}}{C_7H_6O.NCH}$$

The oil, as the formula shows, is a (loose) compound of prussic acid, NCH, and benzaldehyde, C_7H_6O. The common idea that bitter almonds contain prussic acid is erroneous; that acid, like the benzaldehyde, is present only potentially, viz., as amygdaline, which, when the almond meal is treated with water, undergoes the above fermentative change. Many other glucosides are decomposed by emulsine, as they are by dilute acids. It may be said, in passing, that the acrid volatile oil contained in table-mustard is not found ready formed in the mustard seed, but is produced from a constituent of the seed by a fermentative action closely analogous to that we have just been explaining.

4. *Soluble Yeast Ferment.*—It has already been stated that an aqueous extract of yeast, though devoid of the power of inducing vinous fermentation, converts cane sugar into dextrose and levulose. The ferment, as Berthelot showed, can be precipitated from the liquid, in an impure state, by addition alcohol.

5. *Pepsine.*—Stomach digestion (in man and animals nearly related to man) consists mainly in this that the gastric juice dissolves the albuminoids of the food, as hydrochlorates of peptones, the only form, it seems, in which they can be assimilated by the system. The juice owes this power to the presence in it of small percentages of two things, namely, of free hydrochloric acid and of "pepsine," both of which are continuously produced by the mucous membrane. Real pepsine has never been seen; but an impure substance, possessing the specific properties of the ferment, can be extracted from the mucous membrane of the stomach by a laborious process which we have no space to describe. Highly dilute hydrochloric acid alone dissolves certain albuminoids, but it does not convert them into peptones; it acquires this property by the addition to it of a small quantity of the preparation named. It is as well to state in passing that the so-called pepsine of the pharmaceutist is only a very poor apology for even the pepsine of the physiological chemist.

6. *Pancreatine.*—What pepsine is to the gastric juice pancreatine is to the secretion of the pancreas gland, whose function it is to digest the starchy and fatty portions of the food. This "pancreatine" seems to include three ferments, namely, a kind of diastase (see above), a ferment similar in its functions to pepsine, and a ferment which has the power of converting fats into fatty acids and glycerine. None of these has been isolated.

7. *Erythrozyme.*—This is a peculiar ferment which Edward Schunck, in 1854, extracted from madder-root, and which was found by him to possess the power of inducing vinous fermentation in solutions of sugar,—a most important discovery, which ought to be further investigated.

Note.—All these ferments, the acids of course excepted, lose their efficacy at temperatures near 100° C. in presence of water. In the dry state they may survive boiling heat.

B. *Fermentations which are known only as Physiological Processes.*

1. *Vinous Fermentation.*—This case having already been considered, we confine ourselves here to a few additions and qualifications. Vinous fermentation, as we see it going on in the brewers' vats and in the wine-producers' casks, is a function of *Saccharomyces*, a genus of fungi, consisting of minute cells, which sometimes are isolated from one another, sometimes grouped together in a variety of forms, but never united into an organized tissue. There is a variety of species, of which *S. cerevisiæ* (the main constituent of ordinary yeast, as produced in the high fermentation of beer) is the most important. It consists of cells of about $\frac{1}{100}$ millimetre diameter. According to Pasteur, saccharomyces thrives best when immersed in grape juice or wort, or similar liquids. It multiplies only by budding, never by sporification. In pure sugar-water it lives, so to say, at its own expense, and gradually becomes exhausted; but on addition of phosphates (yeast-ash works best) and ammonia salt to the sugar, the plant thrives as well almost as in native sugar juices. When saccharomyces is not fully immersed in the liquor, and otherwise constrained to live under abnormal conditions, it passes into "aërobiotic" forms which are similar to mucors and mucedos (mould plants), and which, like these, live on atmospheric oxygen. But these abnormal forms, when re-immersed in wort, etc., always relapse into the non-aërobiotic form of saccharomyces. Real mucedos, etc., for instance *Mycoderma vini* and *cerevisiæ*, which by nature are aërobiotic, when immersed in wort or grape juice, and thus placed in what to them is an abnormal condition, assume non-aërobiotic forms, and produce vinous fermentation, but (contrary to what was formerly assumed by Pasteur himself) they are never converted into saccharomyces, and their fermentative power soon comes to an end, unless they are occasionally revived by re-exposure to the atmosphere.

The power of inducing vinous fermentation, however, is by no means confined to microscopic organisms. It has long been known, from the experiments of Döbereiner and others, that sweet fruit, when kept within an inert atmosphere devoid of free oxygen, evolves carbonic acid with formation of alcohol, and it has been proved by Pasteur that this fermentation, which may extend to a considerable portion of the sugar present, is not accompanied by the development of any microscopic species. Closely related to this fact is the well-established experience that large quantities of sugar may be made to ferment by means of yeast without the latter multiplying to any noteworthy extent. On the other hand, large growths of yeast may be obtained (and as a matter of fact are obtained every day by the makers of German barm) without producing much alcohol. Oskar Brefeld, by means of a peculiar artifice, succeeded in growing saccharomyces in brewers' wort, without producing a trace of alcohol. From these experiences we must conclude that vinous fermentation, far from being the characteristic life-function of healthy saccharomyces, is dependent on a certain pathologic condition of "non-photobiotic" plant-cells (*i. e.*, cells which habitually live in darkness) generally, which is brought about by immersing them in sacchariferous fluids and shutting them out from the oxygen gas which they need for their healthy development. Hence, even in the ordinary cases of fermentation, the normal life of the yeast-plant on the one hand, and the dissociation of the sugar on the other, are not only not necessarily related, but, in the individual cell, positively exclude each other. In any given mass of yeast, healthy cells and diseased cells are in general mixed up together, and thus, in practice, the two phenomena come to be accidental concomitants. But this brings us back almost precisely to the later views of Liebig, as set forth in his last memoir on the subject.

In regard to the genesis of the yeast plant little is known According to Pasteur's experiments and observations the yeast which forms spontaneously in grape juice is derived chiefly from certain germs which abound about harvest time on the grapes, and still more on the grape-stalks. These germs are largely diffused also through the atmosphere of breweries, wine cellars, and laboratories where fermentation experiments are carried on, but they are not by any means widely diffused through the atmosphere generally.

2. *Lactic Fermentation.*—Milk when left to itself in warm weather, as everybody knows, soon turns sour, the main feature in the chemical process being the transmutation of the milk sugar into lactic acid, as expressed by the equation

$$\underset{\text{Hydrated Milk sugar.}}{C_{12}H_{22}O_{11}.H_2O} = \underset{\text{Lactic acid.}}{4C_3H_6O_3}$$

The milk sugar, before assuming the form of lactic acid, probably passes through the condition of glucose. At any rate, ordinary glucose, when dissolved in milk, ferments into lactic acid along with the milk sugar originally present. But in this case if the total percentage of sugar goes beyond a certain limit, the reaction comes to a stop as soon as the acidity of the liquid has attained a certain limit-value. Addition of chalk or carbonate of soda, *i. e.*, conversion of the lactic acid into a neutral lactate, then revives the process. A solution of "invert-sugar" (as produced by boiling cane sugar water with a little vitriol), when mixed with excess of chalk and some putrid cheese, and kept at 30°–35° C., soon ferments, with formation of large quantities of lactate of lime (Bensch). Lactic fermentation, according to Pasteur, is caused by the development in the mass of a microscopic fungus, consisting of cylindrical cells which are far smaller than those of saccharomyces. We are not aware that this "lactic ferment" has ever been seen in ordinary sour milk; in Bensch's process it is produced largely as a grayish deposit on the chalk, from which pure growths of the fungus may be obtained by Pasteur's method (see above). The lactic ferment, to the annoyance of brewers, frequently occurs in ordinary yeast as an impurity.

There is no doubt that that fungus which Pasteur calls *the* lactic ferment is capable of inducing lactic fermentation; but it does not by any means follow that it is the thing which actually causes the souring of milk under ordinary circumstances. On the contrary, from a remarkable set of experiments made by Lister in 1873, this appears not to be the case. According to him, milk can be completely purged of germs by exposing it (within a germless flask) to the temperature of boiling water for some hours, and, when protected against atmospheric germs by a slightly carbolized stopper of cotton wool, keeps sweet for an indefinite time. Specimens of such germless milk, when exposed to the atmosphere of his study, were found by Lister to undergo a variety of fermentative changes, accompanied sometimes by the development of an acid reaction, but none of them set into sour milk. A specimen of ordinary unboiled dairy milk when kept in the same room did get sour as usual, and, when examined under the microscope, was found to contain, not Pasteur's fungus, but a kind of motionless bacterium which Lister calls *B. lactis*, because the introduction of it (or rather of a trace of the sour milk containing it) into the germless milk determined normal lactic fermentation, the *Bacterium lactis* multiplying at the same time. The same bacterium, when made to pass successively through germless urine and other germless organic liquids, underwent a series of metamorphoses, but, when ultimately put back into milk, caused normal lactic fermentation. The germs of this bacterium must be assumed to abound in the atmosphere of cows' stables and dairies, although they do not seem to be abundantly diffused through the atmosphere generally.

3. *Viscous Fermentation* is a peculiar change which has long been known to occasionally accompany vinous fermentation, and which manifests itself in this that the wine becomes thick and viscous, so that, when poured from one vessel into another, it draws into long threads. This property is caused by the presence of a kind of gum (of the composition $C_{12}H_{20}O_{10}$) which is invariably accompanied by mannite, a sweet crystalline substance of the composition $C_6H_{14}O_6$ (*i. e.* containing the elements of glucose $C_6H_{12}O_6$ + those of hydrogen, H_2). The exact nature of the reaction is not established; in fact, we do not know whether it is one reaction or a set of reactions going on simultaneously. According to the usually adopted equation, 100 parts of cane sugar should yield 51 of mannite, 45·5 of gum, and 6 of carbonic acid. According to Péligot (supported by Pasteur) the "viscous ferment" is a fungus consisting of very minute spherical cells (of 0·001 to 0·0014 millimetre diameter).

4. *Butyric Fermentation.*—In the lactic fermentation of glucose, as induced by milk or cheese in the presence of chalk, the lactate of lime is no sooner formed than it undergoes itself a further change, which, chemically, is represented approximately by the equation

$$\underset{\text{Lactic acid.}}{2C_3H_6O_3} \qquad \underset{\text{Butyric acid.}}{C_4H_8O_2} \quad + \quad \underset{\text{Carbonic acid.}}{2CO_2} \quad + \quad \underset{\text{Hydrogen gas.}}{2H_2}$$

The temperature most favorable to the change lies near 40° C. A number of similar changes (of other organic acids than lactic) are known, but they are passed over here, being of a more purely scientific interest. According to Pasteur, butyric fermentation is caused by the development in the mass of a special kind of vibrio, a worm-shaped animalcule, consisting of a number of longitudinal cells, each about 0·002 millimetre thick, and from 0·002 to 0·02 mm. long. Butyric fermentation, strictly speaking, is only one of a large genus of changes customarily summed up under the generic name of putrefaction.

5. *Putrefaction.*—The scientific meaning of this term coincides pretty much with its popular acceptation, except that it must be understood to be exclusive of all cases of oxidation. In olden times it was assumed that organized matter (the tissues of plants and animals, blood corpuscles, etc.) could hold together even chemically only as long as supported by the vital force. But this is a long exploded notion. In absolute absence of water, or at very low temperatures, dead organized matter remains chemically (and even structurally) unchanged. In support of this assertion we need only refer to that well-known case of the mammoth of the Siberian cave, which was found sweet and fresh thousands of years after the extinction of life. And since the time of Appert (who discovered the now so extensively used process of preserving meats in sealed-up tins) we know that prolonged exposure to boiling heat and subsequent absolute exclusion of air prevent putrefaction, even in presence of liquid water and at the ordinary temperature, as long as the air remains excluded. Chemically speaking, ordinary putrefaction is a most complex phenomenon, always involving the simultaneous on-going of a multiplicity of chemical reactions. A comparatively simple case is the putrefaction of urine, which substantially consists in this that the urea, by assimilating water, passes into carbonate of ammonia, just as it does when heated by itself with pure water to high temperatures. In the case of animal tissues, which, broadly speaking, may be said to consist of fats and albuminoids, the latter always give way first. Their decomposition is a most complex set of successive reactions,—leucine, tyrosine, fatty acids, and many other things appearing as primary products, ammonia, compound ammonias, sulphuretted hydrogen, hydrogen, and nitrogen as secondary ones. Less rapidly, but none the less constantly, the fats are changed, being decomposed, in the first instance, into fatty acids and glycerine, which latter undergoes further transmutations, while the former survive for a considerable time. The "adipocere" which is so well known as one of the constant ultimate products of the decay of dead bodies that have been kept from the air, and which consists of palmitate and stearate of lime (Hoppe-Seyler), well illustrates the high stability of fatty acids. Regarding the causes of putrefaction, we can scarcely do more than refer to what we have quoted from the researches of Schwann and his followers. From these researches two things are clear, namely, (1) that putrefaction is not possible under conditions precluding the development of life, or, in other words, that there is no putrefaction where there is not at least potential life; and (2) that in 999 out of a thousand cases this potential life assumes the actual form of bacteria and vibriones.[1]

Putrefactions going on in presence of air are always accompanied by *processes of oxidation*, the effects of which are difficult to differentiate absolutely from those of putrefaction pure and simple.

C. *Cases of Oxidation.*

1. *Acetous Fermentation* is the best known of these. Everybody knows that weak fermented liquors, when exposed to the air, soon turn sour and ultimately become vinegar. The chemical reaction involved consists of two stages. In the first the alcohol in the liquor absorbs oxygen from the air, with formation of aldehyde and water, according to the equation

$$\underset{\text{Alcohol.}}{C_2H_6O} \quad + \quad O \quad = \quad \underset{\text{Aldehyde.}}{C_2H_4O} \quad + \quad \underset{\text{Water.}}{H_2O}$$

This aldehyde, however, in ordinary acetous fermentation never actually appears, being at once oxidized by the direct action of the air into acetic acid, thus:

$$\underset{\text{Aldehyde.}}{C_2H_4O} \quad + \quad O \quad = \quad \underset{\text{Acetic acid.}}{C_2H_4O_2}$$

These two reactions can be realized in all their chemical simplicity, not, it is true, by oxygen-gas pure and simple, but easily by oxygen as condensed on platinum-black; and as the deoxidized platinum-black readily reabsorbs oxygen from the air, a small quantity of this reagent suffices to oxidize large quantities of alcohol into acetic acid by means of atmospheric oxygen. Upon this observation of Döbereiner's Schützenbach based a rapid and practical method of vinegar-making, which consists in this, that the dilute alcohol is made to trickle through a tower of beech-wood shavings, packed into a tall barrel, constructed so as to draw in an ascending current of air. When a temperature of 20° C. is maintained in the room, and the spirit introduced having a temperature of 26°, the temperature within the barrel is found to rise to 38°–40°, the heat being produced by the rapid oxidation of the alcohol into acetic acid. What, in the old method of vinegar-making, required weeks or months is thus accomplished in a day or even less. It is difficult to avoid the conclusion that in Schützenbach's process the wood-shavings, besides serving to spread the alcohol over an immense surface, act exactly as the platinum-black does in Döbereiner's experiment, condensing oxygen in their pores in order to hand it over to the alcohol. And, supposing this theory to be correct, the old process, which consists in exposing the wine to the air in half-filled tubs or casks, would appear to rest on the same principle,—the wood of the cask acting as the shavings do in Schützenbach's process, only far more slowly. But then it is an old experience of vinegar-makers that the old process at least always involves the formation of two organized products, namely, that of a kind of mould which appears on the surface as a membrane, and goes by the name of "flowers of vinegar," and that of a mucilaginous mass within the liquid, called "mother of vinegar;" and it has always been admitted that the presence of these substances materially accelerates the process of oxidation. This, however, is no contradiction to the theory; it would only prove that the mould-membrane and the mucilaginous mass are more effective carriers of oxygen than the wood of the tub. Besides, in Schützenbach's process, the shavings, according to experience, work the better the freer they are from organized deposits. Hence, one might say, with Liebig, that the efficacy of these substances is a function only of their physical and chemical condition, the presence of life in the mould plant being purely accidental and immaterial to the process. According to Pasteur this view is a mistake. With him it is the membranous mould on the surface of the fermenting liquid which hands the oxygen to the alcohol, and it does so only when it consists of living specimens of a certain species of mould-plant which he calls *Mycoderma aceti.* Other moulds or dead *Mycoderma aceti* do not work. Mother of vinegar, according to Pasteur, is the "non-aërobiotic" form of the mycoderma. Only the aërobiotic form acts. To keep it alive we must take care that the liquid contains the phosphates and the albuminoids or ammonia, which it needs as food. But, if it is to produce vinegar, it must not be fed too liberally, because, when in a vigorous state of health, it oxidizes the alcohol into carbonic acid and water. If the oxidation is to stop at acetic acid, the mycoderma must be in a peculiar abnormal condition, which may be ensured by the presence in the liquid of a certain limit percentage of alcohol. In the case of Schützenbach's process, Pasteur maintains (in spite of apparently contrary experience) that it is the very same *Mycoderma aceti* which enables the wood shavings to act. One of his arguments is the acknowledged fact that Schützenbach's towers require to be started with ordinary vinegar although they can be worked with distilled spirits. A more powerful argument he derives from the following experiment. A very slow current of dilute alcohol was caused to trickle down a long string suspended in a room kept at the most favorable temperature to acetous fermentation. The alcohol failed to assume an acid reaction. But the slightest coating of *Mycoderma aceti* attached to the string caused it to act exactly as the shavings do in the Schützenbach casks. After all, however, it is a little difficult to believe that the many pounds of alcohol which, in the course of a day, pass through a Schützenbach tower and come out below as acetic acid, have all been under the direct influence of the few grains of *Mycoderma aceti* which a microscopist might hunt up amongst the wood shavings. It appears far more rational to assume that the mycoderma acts only indirectly, perhaps by converting a small portion of the alcohol into *aldehyde,* which diffuses itself through the whole mass of the alcohol, and, through its inherent attraction for oxygen atoms, which is assisted by a similar tendency in the porous wood, reduces the stability in a far larger number of oxygen molecules than it needs itself, to such an extent that these so to say half-liberated oxygen atoms become available for the oxidation of alcohol, the more readily as the reaction itself involves a considerable liberation of energy.

2. *Eremacausis.*—Animal and vegetable matters, besides being liable to putrefy, are known, on exposure to air and water, to undergo a slow process of oxidation which ultimately converts them into products of simpler atomic constitution. Speaking quite generally, the process, in the case of wood and vegetable

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[1] Bacteria are microscopic organisms, composed of two elongated cells united end to end, possessed of varied powers of motion, and almost without exception "rather in themselves reproductive organs" (Lister) than beings possessed of powers of reproduction. The vibriones are seemingly nothing more than polymerized bacteria with intensified powers of locomotion. With regard to their position in the world of life present evidence leaves it uncertain whether they are plants or animals

tissues generally, consists in this, that the hydrogen is eliminated more and more completely—most of it in the form of water, a small portion in the form of marsh gas (CH_4), the rest of the carbon passing gradually into substances more and more closely allied to charcoal. In the case of albuminoids eremacausis is always preceded and accompanied by putrefaction,—the most general effect of the former being that the ammonia produced by the latter is turned into nitrogen and water, or, in the presence of basic substances, such as lime, carbonate of lime, carbonates of alkalies, etc., is oxidized into nitrites and nitrates successively. This process of "nitrification" is going on in all porous soils and waters contaminated with nitrogenous organic matter, and, under favorable circumstances, progresses at a great rate. When sewage is filtered through a bed of porous soil, the drainage waters are generally found almost free from ammonia, the whole of the nitrogen having been oxidized into nitrites and nitrates. According to recent researches by Schlösing and Müntz (which were confirmed by Warrington) nitrification, like acetous fermentation, is determined by the presence in the soil of organized ferments, the chief arguments being that a purely inorganic soil does not act, and secondly, that nitrification in a soil is stopped, or at least very effectually checked, by antiseptic vapors such as those of bisulphide of carbon, chloroform, and carbolic acid. (W. D.)

FERMO, the ancient *Firmum Picenum*, an archiepiscopal city of central Italy, and the chief town of a circle in the province of Ascoli Piceno, 34 miles S. by E. of Ancona. From its situation on a rocky height it commands a splendid prospect of the surrounding country, including a fine view of the Adriatic Sea. It is surrounded by old walls, and besides the cathedral possesses numerous churches and convents, a university, and two fine collections of statuary and paintings. The ruins of the ancient Roman town, which was destroyed in the 5th century, are still to be seen. Lactantius and Galeazzo Sforza were born in Fermo. The port, Porto di Fermo, is situated on the Adriatic, about four miles from the town. The harbor is small, but there is some trade in corn, silk, and woollens. The population of Fermo in 1871 was 7002.

FERMOY, a market-town of Ireland, in the East Riding of the county of Cork, is about 21 miles distant from Cork, and about 130 miles from Dublin, and is connected with both these cities by the Fermoy branch of the Great Southern and Western Railway. It is situated on the river Blackwater, which divides the town into two parts, the larger of which is on the southern bank, and there the trade of the town, which is chiefly in flour and agricultural produce, is mainly carried on. A stone bridge of 13 arches which formerly spanned the river, and which had been erected in 1689, was in the year 1866 removed, and replaced by one of strong cut stone. The town, which strikes the visitor as being exceedingly neat and clean, has several good streets, and some noteworthy buildings. Of the latter, the most prominent are the military barracks on the north bank of the river, capable of accommodating 3000 men, the Protestant Episcopal church, the Roman Catholic cathedral, St. Colman's Roman Catholic college, the convents, and the court-house. Quarter sessions are held in the town, and the municipal affairs are managed by fifteen commissioners, who meet every alternate Wednesday. The market day is Saturday. The population in 1871 numbered 7388, 78 per cent. being Roman Catholics.

FERNAN CABALLERO. See FABER, CECILIA BÖHL VON.

FERNANDEZ, ALVARO, one of the numerous band of Portuguese explorers who, in the earlier part of the 15th century, took part in the search for a sea-passage into the Indian Ocean, was born about the year 1420, and seems to have been brought up as page or esquire to Prince Enrique of Portugal. He was related to Joam Gonsalvez, discoverer of Madeira and governor of Funchal. While still a comparatively young man, he was commissioned to prosecute the exploration of the African coast. After visiting the mouth of the Senegal and landing on the island of Gorée, he succeeded in reaching Cape de Matos or Mastos, the most southerly point that had ever been attained (1446). Soon afterwards he took command of a second expedition, in which the utmost limit reached was Rio Tabite, a little to the south of Rio Grande. Ill health thereafter compelled his return to Portugal, where he was welcomed at court as a distinguished discoverer. See Azurara, *Historia de la Conquista de Guine*, and Joam de Barros, *Asia*, dec. i. lib. i. c. 13, 14.

FERNANDEZ, DIEGO, a Spanish adventurer and historian of the 16th century. He was originally educated for the church, but about 1545 he embarked for Peru, where he served in the royal army under Alonzo de Alvarado. Mendosa, marquis of Cañete, who succeeded Alvarado as viceroy, bestowed on Fernandez the office of chronicler of Peru; and in this capacity he wrote a narrative of the insurrection of Giron, of the rebellion of Gonzalo Pizarro, and of the administration of Gasca. The whole work, under the title *Historia del Peru*, was published at Seville in 1571. It is written in a clear and intelligible style, and with more art than is usual in the compositions of the time. It gives copious details, and, as he had access to the correspondence and official documents of the royalist leaders, it is, although necessarily possessing a royalist bias, the fullest and most authentic record existing of the events it relates. A notice of the work will be found in Prescott's *History of the Conquest of Peru.*

FERNANDEZ, JOAM, a Portuguese traveller, also of the 15th century. Early in life he had been taken captive by pirates of Barbary. While amongst them he acquired a knowledge of Arabic, and had his curiosity stimulated with regard to the geography of the African continent. On regaining his freedom he joined an exploring expedition, and got himself landed at the mouth of the Ouro river (lat. 23° N.), where, exposed to considerable hardship and danger, he spent seven months of a nomadic life with some of the native tribes, and acquired a considerable amount of information about the geography of the interior (1445). Two years afterwards he explored the territory in the neighborhood of Cape Blanco. He deserves some notice as having been the earliest of modern African explorers. The narrative of his adventures, which is said by those who have seen it to resemble that of Mungo Park, is to be found in Azurara's *Conquista de Guine.*

FERNANDEZ, JUAN, a Spanish navigator and discoverer. While navigating the coasts of South America it occurred to him that the south winds that almost constantly prevailed near the shore, and retarded the voyages between Peru and Chili, might not exist further out at sea. His idea proved to be correct, and by the help of the trade winds and some currents at a distance from the coast he made a voyage with so great rapidity that he was apprehended on a charge of sorcery. His inquisitors, however, accepted, with a readiness far from common, his natural explanation of the seeming marvel, and he was set at liberty. During one of his voyages in 1563 Fernandez discovered the two islands which now bear his name. He was so enchanted with their beauty and fertility that he solicited the concession of them from the Spanish Government. It was granted in 1572, but a colony which he endeavored to establish at the largest of them soon broke up, leaving behind them a number of goats, the progeny of which still continue on the islands. In 1574 Fernandez discovered the islands of St. Felix and St. Ambrose, and his companions who survived him affirmed that during a voyage in 1576 in the southern ocean he came in sight of a continent, which must have been either Australia or New Zealand if the discovery is to be accepted as a fact, but more probably it was either a delusion or an invention of his followers. See Alexander Dalrymple, *An Historical Collection of the several Voyages and Discoveries in the South Pacific Ocean*, London, 1769-71.

FERNANDEZ, JUAN, a Spanish sailor and adventurer. In 1531 he joined the army of the celebrated Francesco Pizarro, conqueror of Peru, with a small force, but in 1533 he passed into the service of his rival Pedro de Alvarado. When the latter, however, agreed for a sum of money to cede his claims on Peru and make over his navy to Pizarro and Almagro, Fernandez necessarily returned to the service of Pizarro, who not only granted him pardon, but gave him the command of the ship. In 1538 he accompanied Antonio de Sedeño on an expedition despatched by the Spanish Government against the island of Trinidad. Instead, however, of attempting to fulfil the purpose of the expedition, they were tempted by rumors of the existence of gold to disembark on the mainland, where, after enduring great privations and hardships, both leaders died in the winter after they set out, without finding the object of their quest. The survivors, under four different leaders, and decimated by hunger, fatigue, and continual combats with the natives, managed to find their way to the Spanish settlements.

FERNANDO DE NORONHA, a group of islands in the South Atlantic, about 194 miles N.E. of Cape St. Roque, South America, 3° 50′ S. lat., 32° 25′ W. long. The largest of them is about 20 miles in circumference, its surface is rugged, and it contains a number of rocky hills from 500 to 700 feet high, and a mountainous peak towering to the height of about 1000 feet. The island is covered with wood, but on account of the irregular occurrence of rain, it contains scarcely any other vegetation. It has several harbors defended by forts, and serves as a place of banishment for criminals from Brazil. The next largest island of the group is about a mile in circumference, and the others are small barren rocks. The convict village numbers about 1000 inhabitants, and consists of a square formed by the governor's residence, a chapel, the prison, workshop, and Government stores, and three or four streets radiating upwards, and composed of wattle-built huts. About 1000 additional convicts are employed in cultivating the plantations in different parts of the island. The island is occupied by about 150 soldiers and 6 officers under a governor. Stores, convicts, and mails are carried by steamer twice a month to and from Pernambuco.

See "Visit to Fernando Noronha" by Alexander Rattray, M. D., R. N., in *Journal of the Royal Geographical Society* for 1872.

FERNANDO PO, or Fernao do Pao, an island on the W. coast of Africa, lying in the Bight of Biafra, about 20 miles from the mainland, in 3° 12′ N. lat. and 3° 48′ E. long. It is about 44 miles in length from N.N.E. to S.S.W., and about 20 in breadth. The coasts are steep and rocky, and the interior is mountainous. A ridge of mountains towards the centre of the island rises to the height of 8000 feet, and is terminated at each extremity by a peaked mountain,—the northern one (Ste. Isabelle) attaining a height of 10,700 feet. The southern extremity of the island is also intersected by several steep mountains, varying from 1000 to 3000 feet. These mountains are covered, most of them to their summits, as are the intervening valleys, with dense forests of shrubs and lofty trees of luxuriant growth. The rocks are of volcanic origin; and the soil is rich and fertile, producing rice, sugar-cane, cotton, tobacco, yams, and palms. Antelopes, monkeys, sheep, goats, fowls, turtle, and fish are abundant. The climate is salubrious, though the rainy season lasts from May to December, and is succeeded by a season of dense fogs. The principal harbor, Port Clarence on the northern shore, is frequented by English vessels, especially for palm-oil. This island was discovered in 1471 by a Portuguese navigator, whose name it bears. It was taken possession of by Spain in 1778, but was abandoned in 1782. The English formed a settlement on the island in 1827, and made use of it as a harbor for the ships of war sent to watch the slave traffic, but they relinquished it in 1834; the Spaniards resumed possession of it in 1844, and changed its name to *Puerto de Isabel*. The population is about 15,000, and is composed partly of half-breed Portuguese, negroes formerly freed by the British, a few Europeans, and the native inhabitants called Edeeyahs or Bobies, who are in the proportion of ten to one of all the others, and whose jealous hostility perhaps, as much as the reputed insalubrity of the climate, has prevented the colonization of the island by Europeans. The Baptist missionaries who settled on the island during its occupation by the British were expelled by the Spaniards in 1858. See Benedetti, "Les îles espagnoles du golfe de Guinée," in *Bull. de la Soc. de Géogr.*, 1869.

FERNEL, Jean François (1497–1558), a distinguished French physician, was born at Clermont in 1497. After receiving his early education at his native town, he entered the college of Sainte-Barbe, Paris, where he so distinguished himself in mathematics, philosophy, and languages, that not long after obtaining his M.A. degree he was offered a professorship in the college. This offer he, however, declined, choosing in preference to become a physician. He received his doctor's degree in 1530, and was named professor of medicine in 1534. His extraordinary general erudition, and the skill and success with which he sought to revive the study of the old Greek physicians, gained for him a great reputation, and ultimately the office of physician to the court. He practised with very great success, and at his death in 1558 left behind him an immense fortune.

His principal works are *Monalosphærium, sive Astrolabii genus, generalis Horarii Structura et Usus; De Abditis Rerum Causis; Medicina ad Henricum II.;* and *Consiliorum Medicinalium Liber*. All of them have been several times reprinted.

FERNOW, Karl Ludwig (1763–1808), German art-critic and archæologist, was born in Pomerania, November 19, 1763. His father was a servant in the household of the lord of Blumenhagen. At the age of twelve he became clerk to a notary, and was afterwards apprenticed to a druggist. While serving his time he had the misfortune accidentally to shoot a young man who came to visit him; and although through the intercession of his master he escaped prosecution, the untoward event weighed heavily on his mind, and led him at the close of his apprenticeship to quit his native place. He obtained a situation at Lübeck, where he had leisure to cultivate his natural taste for drawing and poetry. Having formed an acquaintance with the painter Carstens, whose influence was an important stimulus and help to him, he renounced his trade of druggist, and set up as portrait-painter and drawing-master. At Ludwigslust he fell in love with a young girl, and followed her to Weimar; but failing in his suit, he went next to Jena. There he was introduced to Professor Reinhold, and in his house met the Danish poet Baggesen. The latter invited him to accompany him to Switzerland and Italy, a proposal which he eagerly accepted (1794) for the sake of the opportunity of furthering his studies in the fine arts. On Baggesen's return to Denmark, Fernow, assisted by some of his friends, visited Rome and made some stay there. He now renewed his intercourse with Carstens, who had settled at Rome, and applied himself to the study of the history and theory of the fine arts and of the Italian language and literature. Making rapid progress, he was soon qualified to give a course of lectures on archæology, which was attended by the principal artists then at Rome. Having married a Roman lady, he returned in 1802 to Germany, and was appointed in the following year professor extraordinary of Italian literature at Jena. In 1804 he accepted the post of librarian to Amelia, duchess-dowager of Weimar, which gave him the leisure he desired for the purpose of turning to account the literary and archæological researches in which he had engaged at Rome. His most valuable work, the *Römische Studien*, appeared in 3 vols., 1806–1808. Among his other works are—*Das Leben des Künstlers Carstens* (1806), *Ariosto's Lebenslauf* (1809), and *Francesco Petrarca* (1818). Fernow died at Weimar, December 4, 1808. A memoir of his life by Johanna Schopenhauer, mother of the philosopher, Arthur Schopenhauer, appeared in 1810, and a complete edition of his works in 1829.

FERNS, a large group of cryptogamic plants forming in a wide sense a very naturally limited group. In the article Biology (vol. iii. p. 600) it has been shown that the subkingdom Cormophyta includes three well-marked series, *Bryophyta, Pteridophyta, Phanerogamæ*. Of the second of these, Ferns, in the most restricted acceptation of the word, are the most conspicuous representatives. It will be convenient, however, to give some account under the present head, not merely of ferns proper, but also of the other smaller groups, closely related to ferns and often spoken of in familiar language as Fern-allies, which are included in the *Pteridophyta*.

The life-history of all these is divisible into two distinct stages or generations, in which not only are the external morphological characters extremely different, but the physiological functions are also sharply contrasted. These stages have been termed in the article already referred to the *sporophore* and the *oophore*.

The vigorous vegetative forms which are what are familiarly understood when ferns are spoken of are only one phase of their complete life-cycle. They are the sporophores; and the reproductive bodies they bear (spores) germinate without any process of fertilization, and are therefore not to be compared with seeds. The same thing is equally true of the other members of the series *Pteridophyta*, viz., horse tails, club mosses, selaginellas, etc.

A spore on germination produces a structure which, compared with its immediate parent, is relatively very small, and bears no resemblance to it in form or texture. It is called the prothallium; it is green and membranous, and attached to the surface of the ground by root hairs in ferns and horse tails; in adder's tongues and club mosses it is tuberous and subterranean, while in *Rhizocarpeæ* and *Selaginella* it always remains more or less included within the cavity of the parent spore. The function of the prothallium is entirely reproductive; it develops sexual organs of two kinds, archegonia and antheridia, either upon the same or different prothallia. Hence, in contradistinction to the sporophore—the function of which in this group of plants is purely vegetative—the prothallial generation is termed the oophore.

History.—The older botanists, starting from the study of flowering plants, endeavored to recognize in all other cases the same characteristic points of structure. They did not doubt therefore, arguing from analogy, that ferns were provided with true seeds. Gerarde (1597), remarking the appearance of young plants of *Nephrodium dilatatum* in the neighborhood of old ones, attributed this to the dissemination of seeds, "for I believe all plants have seeds in themselves to produce their kindes." No one, however, at this time could say anything definite about the "seeds" of ferns, and they came to be regarded as highly mysterious. It was supposed that they were of an invisible sort, and by a transference of properties it came to be believed that the possessor of fern seed would be invisible too. Shakespeare makes Chamberlaine say, "We have the receit of fern-seed, we walke invisible." Ray ridicules Tragus for spreading linen cloths upon the ground to catch the seed of ferns on the eve of midsummer night, when, as Ray properly observed, it would be indeed astonishing if any fell, seeing that it is not mature till the autumn.

Columna in 1648 compared the fern frond to butcher's broom, and identified the fructification in the one case with the flowers in the other. Cæsius came to his help, and, having examined the *sori* of a polypody, "telescopii adjumento," detected what he supposed to be seeds, but which were probably only the spore cases. W. Cole appears to have been the first to microscopically observe the spores themselves (1669), and Ray himself described the hygroscopic movements of the spore-cases which assist the dispersion of the spores. Morison (1715) seems to have been the first to put the matter to the test of actual experience. He sowed the spores of hart's tongue, and in due course, without, however, distinguishing clearly the two stages, raised plants from them. This important observation fell completely into oblivion, and when in 1789 Dr. Lindsay, a Scotch physician settled in Jamaica, responded to a request of Sir Joseph Banks for fern plants from that island by suggesting that spores would be much more convenient to send, the latter was quite unprepared for the suggestion, which he treated as a great discovery. Dr. Lindsay accordingly wrote a paper on the subject (which was published in the *Linnean Transactions* a few years afterwards), in which he figured the prothallial stages of *Polypodium lycopodioides*. The spores of ferns were still, however, regarded as equivalent to seeds, *i.e.*, as the result of a process of fertilization similar to that which precedes the development of seeds in flowering plants. A variety of attempts were made to see in hairs or glands upon the young fronds, etc., something that would do duty for an anther. As late as 1832 De Candolle maintained the analogy of the prothallium to a cotyledon. In 1844 Nägeli discovered the *antherozoids*, motile bodies which are set free from the *antheridium*, and which perform in ferns the function of pollen grains. All previous observers had tried to find fertilizing bodies on the vegetative generation, the sporophore, which produces only spores. In 1844 the final step was reached when Suminski found upon the prothallia the *archegonia*, flask-shaped bodies containing a central cell (oosphere) which, when fertilized by the antherozoids, develops into a spore-bearing plant similar to that from which the cycle started. In 1850 Mettenius discovered the details of the reproduction in *Isoetes*. Since that time the researches upon the *Pteridophyta* have been very numerous, and are to be found quoted in Sachs's *Lehrbuch*.

The whole group of the *Pteridophyta* may be classified as follows:—

PTERIDOPHYTA.—Cormophyta with two distinct stages in the life-cycle. Sporophore with high vegetative differentiation. Oophore inconspicuous and destitute of vascular tissue.

Class I. *Filicinæ.*—Leaves highly developed. Sporangia numerous on the fertile leaves.

Sub-Class I. *Filices.*—Leaves without stipular appendages. Sporangia epidermal, containing spores of one kind developed in each from a single primary mother-cell.

Sub-Class 2. *Stipulatæ.*—Leaves with stipule-like appendages. Sporangia containing spores of one kind developed in each from many endogenous primary mother-cells.

Sub-Class 3. *Rhizocarpeæ.*—Spores of two kinds.

Class II. *Equisetinæ.*—Leaves rudimentary. Sporangia 5–10 on the fertile leaves.

Class III. *Lycopodinæ.*—Leaves small (except *Isoetes*), simple Sporangia solitary.

Sub-Class 1. *Lycopodiaceæ.*—Spores of one kind.

Sub-Class 2. *Ligulatæ.*—Spores of two kinds.

I. FILICINÆ.—1. The *Filices* or ferns proper deserve consideration at greater length, both on account of their numerical preponderance over the other groups, and the popular favor which deservedly attaches to their great beauty and variety of form.

Commencing with the vegetative generation or *sporophore*, the following remarks briefly touch upon the most essential points in their organization.

In *general habit*, although with a certain characteristic appearance which, to the experienced eye, is an almost unfailing distinctive character, ferns are as various in stature and aspect as flowering plants. One genus, *Ceratopteris*, is remarkable for its aquatic habit. The terrestrial forms vary from the *Hymenophyllaceæ*, which have the small size and delicate texture of mosses, to the larger forms which attain the size of shrubs, while some belonging to the tropics and the southern hemisphere have a palm-like habit, and are called tree-ferns. *Cyathea medullaris* reaches 80 feet in New Zealand, and *Alsophila australis* even greater heights in Australia. The stem creeps on or beneath the surface of the ground as in the common bracken, or climbs up rocks and the trunks of trees (*Davallia canariensis*). In the latter case it is usually densely coated with imbricated membranous scales. In stems of this type the internodes or spaces between the insertion of successive leaves (fronds) is considerable, and the growing point is often far in advance of the youngest frond. In a large number of herbaceous ferns, of which the common male and lady ferns are good examples, the stem is short and erect or slightly inclined (fig. 1). The fronds are developed spirally, and in close contiguity without obvious internodes; they form, viewed from above, a large rosette with the growing point in the centre. Between the ordinary herbaceous ferns with short erect stems and the tree-ferns there is no hard and sharp line of demarcation. Most of the ferns of decidedly arborescent habit belong to the sub-order *Cyatheaceæ*, which has a sporangium and receptacle a little different from that of the typical *Polypodiaceæ*, but in many of the genera of *Polypodiaceæ*, especially *Dicksonia*, there are species that assume a more or less decidedly arborescent habit. Nearly all *Filices* are perennial, but we have an instance of annual duration in *Gymnogramme leptophylla*.

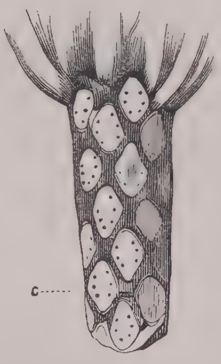

FIG. 1.—Stem of the Male Fern (*Nephrodium Filix-mas*) showing the scars corresponding to the detached bases of the leaves with the marks (*c*) left by the fibro-vascular bundles.

Growing Point.—The apex of the stem, whatever the dimensions of the mature plant, is always occupied by a single apical cell, and the whole growth is entirely dependent upon the repeated segmentation of this cell. In form it is either wedge-shaped with a transverse section like that of a bi-convex lens, or it has the form of a three-sided pyramid with a convex base forming the outer face. In the former case the segments are produced from the cell alternately right and left, and the stem, which is gradually built up by the repeated subdivision of the segments so formed, is always distinctly bilateral, and produces its fronds in two rectilinear series. In the latter case the segments are derived in spiral succession from the three interior faces of the apical cell, and the leaves, which are developed from the masses of tissue to which these segments give rise, are gradually displaced from the simple triseriate arrangement due to the segmentation of the apical cell into more complicated forms of phyllotaxis.

Branching is effected by the partition of the growing point; the single stem therefore bifurcates. This scarcely ever happens in ferns with erect stems, such as *Nephrodium Filix-mas*, or in tree-ferns. New shoots, are, however, sometimes formed from the bases of the leaf-stalks, just as in some species they are normally produced from the fronds themselves. When the terminal point is injured, lateral shoots are often formed in this way. A specimen of *Dick-*

sonia antarctica has been described with as many as twenty-nine crowns, due doubtless to such a cause.

Structure of the Stem.—The repeated subdivision of the cells of the growing point gives rise to a mass of tissue, at first uniform in character, but which is subsequently differentiated. Particular tracts of cells are modified in the process of growth to form the fibro-vascular bundles. These are more or less flattened plates irregularly elliptical in transverse section. As in all the *Pteridophyta* they are closed, and incapable, when once formed, of further increase in diameter. They consist of a mass of "xylem" surrounded by "phloem." The xylem consists, in addition to a few spiral vessels at the foci of the elliptical transverse section, of scalariform vessels—cells of comparatively large diameter, with oblique ends, and with their walls intermittently thickened by transverse projecting ridges (fig. 2). Amongst the vessels are oblong cells containing starch in winter (wood-parenchyma). The phloem contains sieve-tubes, and external to these thick-walled bast fibres. The whole fibro-vascular bundle is bounded first by one or two layers of oblong starch-containing cells (phloem-sheath), and external to these by a single layer of narrower cells, often thickened externally and darker in color—the vascular bundle sheath. In very slender stems the fibro-vascular bundles form a central axis (*Hymenophyllaceæ*), but when the stems attain any size they are arranged in an anastomosing cylindrical network (fig. 3), in which a mesh corresponds to the base of a frond. This cylinder separates the remaining or fundamental tissues of the stem into two portions, an internal central medulla and an external cortex. This is shown in fig. 4; the dark lines, however, do not belong to the bundles which correspond to the light spaces enclosed by them; the dark lines themselves consist of a mass of thickened elongated cells termed "sclerenchyma," which form protecting sheaths to the fascicular tissue. The medulla and cortex are in the main formed of parenchymatous tissue, often loaded with starch. In *Cyathea medullaris* this starchy pith was used by the Maoris as an article of food. The medulla is not, however, entirely parenchymatous; it is usually permeated by a number of anastomosing filiform bundles (usually also invested with a sclerenchymatous sheath), which eventually pass into the leaves through the meshes in the fibro-vascular cylinder. The greater part of the fibro-vascular tissue of the leaves is, however, continuous with the lower portion of the margins of the meshes, which runs out into bundles arranged round the outer circumference of the leaf-stalk, and surrounding therefore the bundles which pass through the meshes from the medulla of the stem. In some cases, however, these medullary bundles contract an adhesion to the margins of the meshes as they pass through them. The surface of the stem, and also of the leaf-stalks, is usually strengthened by the sclerenchymatous development of the superficial portions of the fundamental tissue. This coats the surface with a layer which would be impervious to air were it not interrupted by spaces filled with soft parenchyma, by which the internal tissues of the stem are brought into relation with the atmosphere. In *Pteris aquilina*, the rhizome or horizontal subterranean stem is marked laterally by two lines where the colorless cortical parenchyma is not covered in, and in many tree-ferns the bases of the petioles have their sclerenchymatous investment perforated by pits filled in the living plant by a soft-celled tissue which speedily becomes pulverulent.

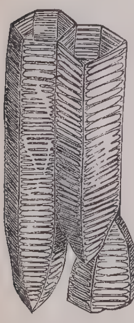

Fig. 2.

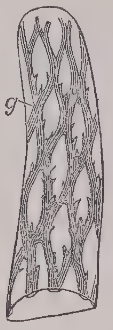

Fig. 3.

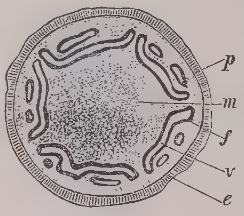

Fig. 4.

Fig. 2.—Scalariform vessels.

Fig. 3.—Fibro-vascular network from the stem of the Male Fern (*Nephrodium Filix-mas*). The spaces contained by the meshes correspond to the attachments of the bases of the leaves.

Fig. 4. Transverse section of the stem of a Tree-Fern (*Cyathea*). *m*, medullary ground-tissue; *p*, cortical ground-tissue; *e*, hypodermal sclerenchyma; *v*, fibro-vascular bundles, with sheathing sclerenchyma (*f*).

The *roots* of ferns are always slender and wiry. They are continually formed during the growth of the stem in acropetal succession. In tree-ferns they consequently accumulate on the lower portion as they grow downward, giving it a large apparent diameter. In creeping species they at once attach themselves. They are cylindrical in all cases, scarcely exceeding one-eighth of an inch in diameter, dark-brown approaching black in color, and clothed with root-hairs.

In ferns the occurrence of a special form of "trichomes" is noticeable in the flat multicellular membranous scales, to which the name of "paleæ" is given. They are found in the greatest abundance on the stem and lower part of the stipes, but they often extend to the rachides of the frond, and sometimes to the foliar surfaces, especially in young fronds. There is no definite correlation in the character of these paleæ with other points of structure. The most characteristic are the long thread-like bright-brown paleæ of *Eudicksonia*, which are so abundant that those of *Dicksonia Culcita* are exported in quantity from Madeira to stuff cushions and mattresses; and the clathrate flat paleæ, dull brown in color and permeated by a distinct lattice-work of thicker cells, which occur in *Vittaria*, *Antrophyum*, and some species of *Asplenium*. By their abundance, position, size, shape, and texture, the paleæ often furnish great help in characterizing species.

Stipes.—Although generally distinguished by this special name, the stipes is simply the petiole of the leaf. It is very rare to find a fern in which the blade of the leaf does not possess a distinct stalk. In about two-thirds of the *Filices*, including not only those with erect, but many with creeping stems, the stipes is continuous with the stem, without any articulation at the point of junction; and when the old fronds die, they do not become disjointed, after the fashion of the leaves of a deciduous tree. In about one-third of the *Filices*, on the contrary, there is a distinct joint at the point of junction between the stipes and the stem, and when the fronds fade, they fall away from the stem spontaneously, leaving a clean scar. In the classification proposed by John Smith, the *Polypodiaceæ* are subdivided by this character. The ferns in which the leaf-stalk is continuous with the stem, as in *Asplenium*, *Nephrodium*, and *Pteris*, he calls *Desmobrya*. Those in which the old fronds become disarticulated at the base, as in *Oleandra*, *Platycerium*, and *Polypodium vulgare*, he calls *Eremobrya;* and he states, as the result of his experience as curator for 40 years of the Kew collection, that the *Desmobrya* may be more easily reproduced from spores, but that the *Eremobrya* show greater tenacity of life, and that in the importation of ferns from abroad the *Eremobrya* generally arrive in good condition, whilst the *Desmobrya*, especially such as have slender stems, often perish in the journey.

Fronds.—In *Filices* we get a more varied range of leaf-form than in any other order in the vegetable kingdom, and some of the most beautiful and complicated types that exist. In size the fronds vary from under an inch, as in some of the minute *Hymenophyllæ*, to a length and breadth of from ten to twenty feet in the great Cyatheas and Dicksonias. To take examples of the leading types from amongst familiar British species, we have simple fronds in *Scolopendrium vulgare*, simply pinnate fronds in *Asplenium Trichomanes* and *Lomaria Spicant*, bipinnate in *Nephrodium montanum* and *Polypodium Phegopteris*, tripinnate or tripinnatifid in *Cystopteris fragilis* and *Polypodium Dryopteris*, and decompound in *Asplenium Adiantum-nigrum* and *Pteris aquilina*. The primary divisions of a compound frond are called pinnæ, the secondary divisions pinnules. In a deltoid frond, as in *Cystopteris montana* or *Pteris palmata*, the pinnæ grow regularly smaller from the lower to the upper, and the lower pinnæ have the pinnules of the under side exaggerated. A decrescent frond, as in *Nephrodium conterminum* or *Asplenium Trichomanes*, has the pinnæ largest at the centre of the frond, and gradually smaller both towards its top and bottom. There is no regular relation between the frond and its fructification. Species with fronds similar in texture, cutting, and veining are often found, when the fructification is examined, to stand widely apart in systematic position. The growth of the fronds is very slow. The whole of the fronds of a rosette of *Nephrodium Filix-mas* have been in course of formation two years before the lamina begins to unroll. The development is basifugal, and often the fronds continue growing at the top a long time after they are fully unfolded and producing fructification at the base. This may be seen in *Hymenophyllum sericeum* and *Gymnogramme elongata;* in *Lygodium* the leaf-stalk resembles a twining stem, growing for a long time. In many cases the fronds are of two kinds, developing from the first in a conspicuously different manner, one kind remaining permanently barren, and the other alone producing fructification. We have instances of this in *Lomaria Spicant* and *Cryptogramme crispa*, and dimorphism is shown still more conspicuously in *Platycerium*, in which the barren fronds are uncut and spread out flat over the surface on which the plant grows, and the fertile ones are much larger, and stand erect, and are forked, from which it takes its common name of elk's-horn fern. There is another striking instance of dimorphism in the section *Drynaria* of the genus *Polypodium*, in which the barren fronds are brown in color, rigid in texture, small in size, and lobed like the leaf of the common oak, and the fertile ones are several feet long, with elongated segments like those of *Polypodium vulgare.* In some ferns the fronds have a habit of taking root at the tip, and thus producing new plants. This is well shown in the walking-leaf of North America (*Scolopendrium rhizophyllum*), and amongst tropical ferns in *Asplenium rhizophorum* and *Acrostichum flagelliferum.* Some species develop copious adventitious buds, from which the plant may be reproduced, sometimes scattered over the surface of the frond, as in *Asplenium viviparum* and *A. bulbiferum*, sometimes in the axils of the pinnæ, as in *Asplenium proliferum* and *Nephrodium cicutarium.*

Venation.—In the arrangement of the veins of the fronds of *Filices* there is an extraordinary amount of variety. The different types, and the extent to which they prevail, and the use that may be made in the systematic arrangement of ferns of the characters they furnish, were carefully worked out by Presl and John Smith. The two principal leading types are veins, that, after once branching, do not again unite, and veins that, on the contrary, after branching, join one another so as to inclose areolæ like the meshes of a net. Ferns that exhibit the first plan are said to be free-veined; the other kind are said to have anastomosing venation. The free-veined ferns form far more than half of the order. In the whole frond or its ultimate divisions there may be a midrib alone, as in *Monogramme graminea* or *Hymenophyllum tunbridgense;* or the veining may be simply pinnate, that is to say, a midrib with a series of parallel simple branches on each side, as in *Nephrodium patens* or *N. prolixum;* or there may be a regular midrib from the base to the top of the frond or segment, with the side-branches branched again, a very common type shown in *Pteris aquilina* and *Nephrodium Filix-mas;* or there may be no regular midrib, but the veins arranged like the rays of a fan, as in *Adiantum Capillus-Veneris* and *Asplenium cuneatum.* Whether the veins are produced to the margin, or end abruptly without reaching it, as is common in the free-veined, and still more so in the net-veined species of *Polypodium*, is a point to be noted. Of anastomosing venation the following are the principal types:—

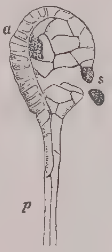

FIG. 5.

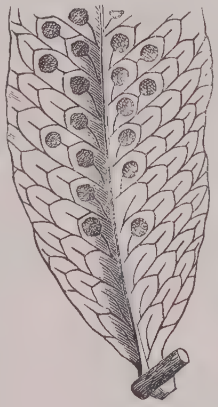

FIG. 6.

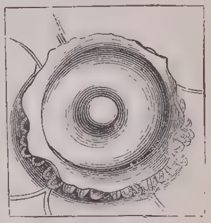

FIG. 7.

FIG. 5.—Mature sporangium of the Male Fern (*Nephrodium Felix-mas*). *p*, stalk; *a*, annulus; *s*, spores discharged from ruptured cavity.

FIG. 6.—Leaf of *Polypodium* of the section *Goniophlebium*, bearing sori on its back.

FIG. 7.—Sorus of *Aspidium trifoliatum.* The annulate sporangia are covered by an orbicular indusium attached by its centre.

1. Where the viens are free nearly to the edge, but connected by an arch just within it, as in the section *Thamnopteris* of *Asplenium* and *Olfersia* of *Acrostichum.*

2. Where the veins are arranged in parallel pinnate groups, and the opposite veins of contiguous groups join at the tip, as in the section *Eunephrodium* of *Nephrodium* and *Goniopteris* of *Polypodium.*

3. Where the veins of contiguous segments are copiously pinnate and free, but the midribs are connected by a single arch and the base, as in the section *Campteria* of *Pteris* and *Pleocnemia* of *Polypodium.*

4. Where the veins unite in regular hexagonal meshes the sori borne at the tip of a single central vein which these inclose, as in the section *Goniophlebium* of *Polypodium.*

5. Where distinct main veins run from the midrib to the edge of a frond or its divisions, and these are connected by a series of parallel arches, from the upper side of which several free veins arise, bearing sori at their tips, as in the section *Campyloneuron* of *Polypodium.*

6. Where distinct main veins run from the midrib to the edge of a frond or its divisions, with copious small irregular areolæ between them, as in the section *Pleuridium* of *Polypodium* and *Gymnopteris* of *Acrostichum.*

7. Where the whole space between midrib and margin is filled up with copious small irregular areolæ, as in the section *Phymatodes* of *Polypodium* and *Chrysodium* of *Acrostichum.*

Many of the large genera, as characterized by the shape and position of the sori, contain groups which show several of these different plans of veining; *Polypodium* and *Acrostichum* show them nearly all. One school of systematists, represented in England by J. Smith and Moore, regard a decided difference in veining as a character important enough in itself to mark a genus; and if this plan be followed the number of genera is enormously increased. Our estimate of 50 for the genera of *Polypodiaceæ* is a large one, if genera founded upon fructification be understood; but Moore, using, venation in addition, reckons the genera at 143, and John Smith at 194. From this different scale upon which genera have been planned arises the large number of different generic names which have often been used for the same plants, so that the synonymy of ferns has become extremely complicated.

The *sporangia* of ferns are morphologically trichomes or modified hairs. They originate from epidermal cells, and in the mature state consist of stalked capsules, the walls of which are one cell thick. A ring of cells differently placed in different genera is called the *annulus*, and by its unequal contraction in drying effects the disruption of the capsule and the dispersion of the spores (fig. 5). In some genera the same object is effected by a group of cells instead of a ring. The separate clusters, of few or many individual sporangia, are called sori (fig. 6), and the membranous excrescence of the epidermis which covers a sorus is called an indusium or involucre (fig. 7).

The orders of *Filices* are founded upon differences in the structure of the individual sporangium. Genera of the same order depend upon differences in the shape and position of the sori and shape and position of the indusium. In a few genera, such as *Osmunda*, *Anemia*, and *Schizæa*, the parenchyma of the lamina is entirely absorbed in the fertile parts of the frond, and the sporangia form distinct panicles or spikes. In *Acrostichum* the sporangia cover the whole of the under surface of the frond, both veins and interspaces. In many genera, such as *Pteris*, *Vittaria*, and *Lindsaya*, the sori run in a line along the very edge of the frond, connecting the tips of numerous veinlets. In *Blechnum* they form a similar line close to the midrib. The commonest type of all is when they form round dots on the veins of the back of the frond, as in *Polypodium*, *Aspidium*, *Woodsia*, and *Cyathea.* A type only less common than the last is where they run in lines along the veins of the back of the frond, as in *Asplenium*, *Scolopendrium*, and *Gymnogramme*. In *Lygodium* the sporangia form spikes on the edge of the leafy segments, each sporangium inclosed in a little pocket. In *Dicksonia*, *Hymenophyllum*, and *Trichomanes*, the sori form round clusters at the tip of a vein on the edge of the lamina. Characters taken from the indusium separate the genera of *Polypodiaceæ* into four tolerably well-marked groups. In a large series of genera, including *Polypodium* with not less than 400 species, *Acrostichum*, and *Gymnogramme*, there is no indusium at all. In another series, including *Pteris*, *Pellæa*, *Cheilanthes*, and *Hypolepis*, there is what is called a spurious indusium, which consists simply of the edge of the frond modified in texture and more or less completely recurved, so as to protect the sorus in an early stage. The true indusia are distinct scales, and are of two kinds,—those called inferior, which originate beneath the sorus, and may be distinctly cup-shaped, as in *Woodsia* and *Cyathea*, or may be one-sided, as in *Cystopteris* and *Davallia;* and those called superior, as in *Nephrodium* and *Aspidium*, which are extended over the sorus. As has been already indicated, all the genera of *Polypodiaceæ*, which include in the aggregate not less than 2000 species, agree with one another in the structure of the sporangia, so that the great majority of existing forms of *Filices* are very closely allied. The classification of ferns is based at present upon characters entirely drawn from the sporophore generation, and takes no account of the oophore. It is undoubtedly to a great extent artificial, but until the development of the prothallium has been carefully worked out in all the different orders, no more satisfactory or more natural arrangement than the following appears attainable.

1. *Gleicheniaceæ.*—Sporangia sessile, splitting vertically, furnished with a complete horizontal ring. Sori composed of very few sporangia; receptacle not elevated. Fronds with very distinct dichotomous branching. Genera 2; species 30.
2. *Hymenophyllaceæ.*—Sporangia sessile, splitting vertically, furnished with a complete horizontal ring. Sori composed of numerous sporangia, inserted on a long filiform receptacle. Fronds of filmy texture, with pinnate branching. Genera 2; species 150–200.
3. *Cyatheaceæ.*—Sporangia nearly sessile, splitting transversely, furnished with a usually incomplete nearly vertical but rather oblique ring. Receptacle prominent, barrel-shaped. Tree-ferns. Genera 3; species 150.
4. *Polypodiaceæ.*—Sporangia stalked, splitting transversely, furnished with a usually incomplete vertical ring. Receptacle not prominent. Genera 50; species 2000.
5. *Osmundaceæ.*—Sporangia stalked, splitting vertically, furnished with only a faint horizontal bar instead of a ring. Genera 2; species 10–12.
6. *Schizæaceæ.*—Sporangia sessile, splitting vertically, crowned by a complete small annular horizontal ring. Genera 5; species 60.

The *oophore*, or sexual generation of ferns, not having been studied to any great extent from the comparative point of view, can only be described in general terms. It is a membranous structure furnished with root hairs, and the cells of which contain chlorophyll; it is therefore capable of obtaining its nourishment independently, and in many respects has a striking resemblance to the simpler *Hepaticæ*. When the spores (for example) of any Polypodiaceous fern are sown, the outer covering bursts, and the inner coat protrudes as a filament, which soon divides and continues to grow into a short row of cells. Cell division next begins to take place laterally as well as longitudinally, and a small cellular plate is formed (Fig. 8), which gradually attains a kidney-shaped outline, the growing point being situate in the notch. From the under side are developed the root-hairs, antheridia and archegonia.

The *antheridium* is morphologically a trichome, and is an outgrowth of a superficial cell. The wall when mature consists of a single layer of cells, inclosing a central cell, from which the antherozoids are developed in separate mother cells. The antheridium eventually bursts owing to the absorption of water, and the spirally-twisted motile ciliated antherozoids (fig. 9) are set free (fig. 10).

The *archegonia* are produced on a cellular cushion immediately behind the notch. They are developed by repeated divisions from a superficial cell, and, when mature, each is a bottle-shaped structure (fig. 11), the rounded base of which is buried in the prothallium, and contains a central cell, the oosphere. The canal of the neck is at first filled by a cell, which eventually deliquesces, and leaves the passage open for the access of the antherozoids to the oosphere, which, after fertilization by blending with them, becomes the oospore. The oospore first divides by a division-wall oblique to the prothallium, and then divides again so as to form four cells. Two of these give rise to a mass of tissue which remains in contact with the prothallium, and is called the foot. Of the other two, one develops into the stem (first leaf), the other into the root. As soon as the young fern-plant (sporophore) is fairly established (fig. 12) the prothallium (oophore) disappears. Its existence is therefore remarkably contrasted by its brevity with the oophore stage in the *Bryophyta*. There are, however, cases in which the conditions of the one group are approached by the other. In *Osmunda* the prothallia admit of vegetative reproduction by the detachment of marginal shoots. In *Gymnogramme leptophylla*, Goebel has shown that the prothallium vegetates in a persistent way, comparable to that of the oophore stage in a moss. The sporophore is very transient in its existence, only living for a few months, and being entirely devoted to the production of spores. Amongst *Bryophyta*, in *Anthoceros* the sporophore exhibits a continued production of spores, which places it nearly on a level with *Gymnogramme*. Farlow has made the remarkable observation that the sporophore may in some case originate from the prothallium without the intervention of a sexual process, by a process of budding.

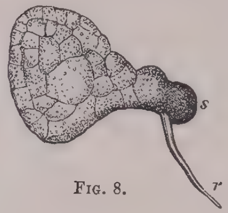

FIG. 8.

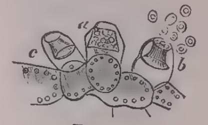

FIG. 10.

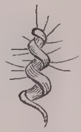

FIG. 9.

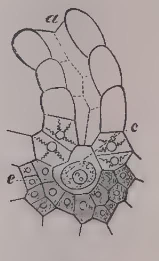

FIG. 11.

FIG. 8.—Germinating spore (*s*) of *Pteris longifolia*, producing a cellular prothallium (*p*) with a root-hair (*r*).

FIG. 9.—Antherozoid of *Asplenium septentrionale*.

FIG. 10.—Antheridia from the prothallium of *Pteris aquilina*. *a*, antheridium unopened; *b*, one discharging cells, each of which contains an antherozoid; *c*, empty antheridium.

FIG. 11.—Archegonium of *Asplenium septentrionale*. *a*, canal; *c*, oosphere, with nucleus (*e*).

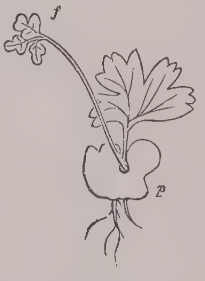

FIG. 12.—*f*, Young Fern-plant (sporophore) of *Pteris palacea*, arising from a fertilized archegonium of *p*, the prothallium (oophore).

2. The *Stipulatæ* include two orders often included among ferns, but differing from them in some very important points. *Ophioglossaceæ* include *Ophioglossum* (adder's tongues) and *Botrychium* (moon-worts), both widely distributed, and *Helminthostachys*, which is found from the Himalayas to Queensland. The leaves as soon as they have attained a certain age bear a fertile branch from the axial side. The sporangia are developed in a manner totally different from those of other *Filicinæ*. Instead of being products of single epidermal cells their origin resembles that of the pollen-sacs of anthers. The sexual generation (oophore) is tuberous and subterranean.

Marattiaceæ is a group of ferns including about four genera. All are essentially tropical, but run more into the south than the north temperate zone. *Danæa* is exclusively American, *Kaulfussia* and *Angiopteris* Old World, *Marattia* cosmopolitan. The sporangia are placed on lateral veins of the pinnæ, and contain two rows of loculi, each of which corresponds to a single sporangium of *Ophioglossum*, and produces a number of spores originating from many primary mother-cells. The development of the sporangia in *Angiopteris*, which differs from other *Marattiaceæ* in the sporangia not being confluent, is still a desideratum for the determination of its affinities.

3. *Rhizocarpeæ* are plants whose affinities have long been obscure, but which are now gradually being seen to be related in many essential points to ferns, though departing from them in other respects. In the growth of the roots, mode of branching, and circinate vernation there is entire agreement, and the fructification, though apparently very different, clearly admits of comparison with the true fern type. For a detailed account of their structure reference must be made to the works referred to below. It will be sufficient here to briefly refer to the fructification. *Rhizocarpeæ* include two orders, *Marsileæ* and *Salvinieæ*. The former consists of the two genera *Pilularia* and *Marsilea*. The former consists of three species of small creeping plants with filiform leaves, one of which is not uncommon in marshy places in Britain; the fruit (sporocarp) is globular, shortly stalked, and springs from the axils of the leaves. The sporocarp is divided by partitions into from one to four cavities, and each of these bears on its outer wall a projecting ridge to which the sporangia are attached. The species of *Marsilea* are widely distributed mostly in hot countries; *M. macropus* is the nardoo of Australia. They all agree in having leaves and long stalks and two pairs of leaflets arranged cross-wise; one pair is developed by lateral branching, the other pair by dichotomy of the growing point. The sporocarp is variously placed, but always in relation to a leaf. Sachs considers that in both *Marsilea* and *Pilularia* the sporocarps are modified leaves bearing the sporangia on their upper sides in definite relation to the fibro-vascular bundles. With regard to position he compares them to the fertile fronds of *Ophioglossaceæ*. In *Marsilea* the sporocarp is bean-shaped, and the sporangia are attached to transverse ridges in small compartments which are torn away in the peculiar dehiscence of the sporocarp (fig. 13).

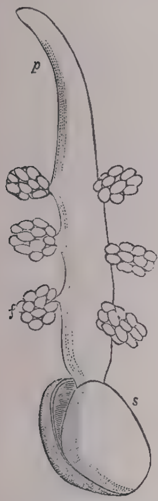

Fig. 13.—Sporocarp (*s*) of *Marsilea Fabri*, discharging a gelatinous cord (*p*) to which the contents of the compartments of the sporocarp are attached; these compartments (*f*) contain both macrosporangia and microsporangia.

The *Salvinieæ* include *Salvinia* and *Azolla*. *Salvinia* is a cosmopolitan genus of five or six species of floating plants distributed over the tropical and warm temperate zones. The sporocarps are developed from teeth of the fertile leaves round which in each case a circular wall grows up covering in the tooth on which the sporangia are developed. This arrangement has been compared to the cup-shaped "involucre" of *Hymenophyllum*. The sporangia are in all the genera trichomes, and their mode of development is very similar to that in *Polypodiaceæ*. The central mother-cell divides ultimately into eight spore mother-cells. The further progress, however, of these varies according as microspores or macrospores are to be formed, each of the eight cells dividing into four in the one case, while in the latter only one does so, and only one of the four daughter-cells attains maturity.

The oophore or prothallial generation in *Rhizocarpeæ* is diœcious from the first, the macrospore alone producing archegonia. This, however, only carries to an extreme point a differentiation of which there are indications amongst ferns. In *Osmunda* all the spores from a sporangium sometimes produce prothallia with antheridia alone. In *Rhizocarpeæ* the differentiation is carried back to the spores themselves. The microspores are male (fig. 14); in *Salvinia* there is a rudimentary prothallium which produces antheridia, and in *Marsilea* and *Salvinia* there is a last trace of such a structure. The macrospores also develop a prothallium from a portion of their contents, which, however, is always for the most part included in the parent spore, which ruptures to expose the archegonia (fig. 15), and allow of the fertilization of one of them.

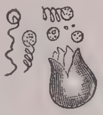
Fig. 14.

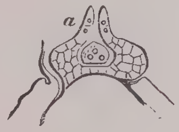

Fig. 15.

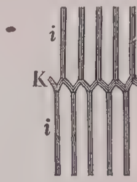

Fig. 17.

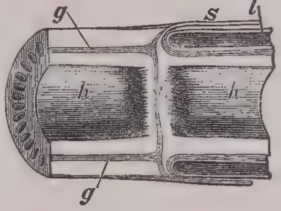

Fig. 16.

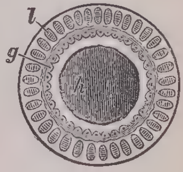

Fig. 18.

Fig. 14.—Microspore of *Pilularia globulifera* burst, and allowing the escape of the antherozoids.

Fig. 15.—Longitudinal section through the apex of a macrospore of *Pilularia globulifera*, showing the rudimentary prothallium with an archegonium (*a*), containing a fertilized oosphere.

Fig. 16.—Longitudinal section through rhizome of *Equisetum Telmateia*, showing—K, septum between two internodal cavities, *h*, *h*; *g*, *g*, fibro-vascular bundles; *l*, air-canal; S, leaf-sheath.

Fig. 17.—Union (K) of alternating fibro-vascular bundles (*ii*) of an upper and lower internode in *Equisetum Telmateia*.

Fig. 18.—Transverse section of rhizome of *Equisetum Telmateia*. *g*, fibro-vascular bundles; *l*, air-canals.

II. Equisetinæ are plants the habit of which in the asexual stage (sporophore) is very singular. The stems are furrowed and jointed, the joints being hollow and closed at each node by a transverse septum (fig. 16). The leaves are reduced to a whorl of membranous teeth which form a sheath at each node, perforated by the slender branches, which also form a verticil. The teeth of each successive

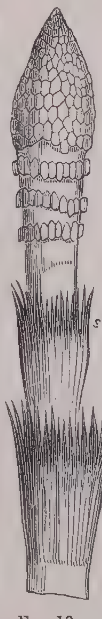

Fig. 19.

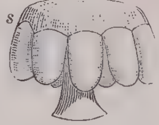

Fig. 20.

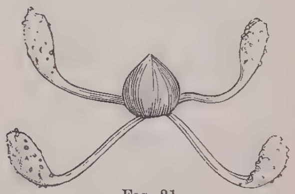
Fig. 21.

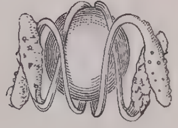
Fig. 22.

Fig. 19.—Fructification of *Equisetum Telmateia*.

Fig. 20.—Peltate scale of *Equisetum* (*s*), bearing sporangia (*t*).

Fig. 21.—Spore of *Equisetum* with the four elaters, produced by splitting of the exospore, dry and expanded.

Fig. 22.—The same with the elaters damp and coiled up.

node alternate. The fibro-vascular bundles also alternate in each successive internode, since they are arranged in a ring, and correspond to the ridges between the furrows which above are continuous into the teeth of a leaf-sheath (fig. 17). Each fibro-vascular bundle contains an air-canal, and another series of air-canals alternate with these and correspond to the furrows (fig. 18). The spore-bearing shoots are usually a good deal different in appearance from the barren stems; they terminate in a kind of cone (fig. 19) composed of closely approximated whorls of modified leaves, which are peltate in form, and bear from 5 to 10 sporangia on their under surface (fig. 20). The spores are furnished with an external coat which splits up into four strips, the hygroscopic movements of which actively assist their dispersion (figs. 21, 22). The oophore consists of a prothallium, which is curiously lobed and curled, but otherwise differs little from that of ferns.

III. Lycopodinæ (*Dichotomæ*, Sachs).—With a considerable range of morphological variation the different genera agree in some important points. The leaves are always simple and unbranched, and contain only a single fibro-vascular bundle. The branching of stems and roots is always dichotomous, and the dichotomies, with some exceptions, succeed one another in planes at right angles. In their reproductive processes *Lycopodiaceæ* and *Ligulatæ* are related in the same manner as *Filices* and *Rhizocarpeæ*.

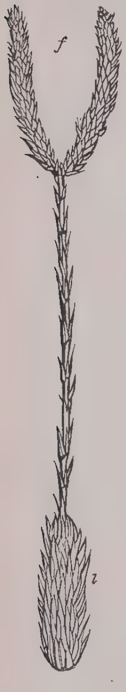

Fig. 23.

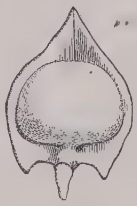

Fig. 24.

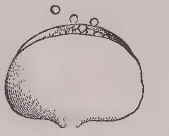

Fig. 25.

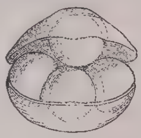

Fig. 26.

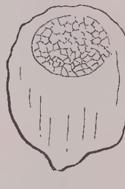

Fig. 27.

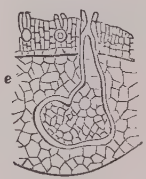

Fig. 28.

Fig. 23.—Branch of *Lycopodium clavatum* with sporangiferous spikes.
Fig. 24.—Leaf from the spike of *Lycopodium*, bearing a sporangium.
Fig. 25.—Detached sporangium of a *Lycopodium* opening to discharge the spores.
Fig. 26.—Detached macrosporangium of a *Selaginella* opening to discharge the four macrospores.
Fig. 27.—Contents of macrospore of *Selaginella Martensii*, showing the young prothallium (*p*).
Fig. 28.—Vertical section through the upper part of a macrospore of *Selaginella*, showing the prothallium with unfertilized archegonia, and an embryo growing downwards into the endosperm.

1. *Lycopodiaceæ*, besides the club-mosses (*Lycopodium*), includes three other small genera, *Psilotum*, *Tmesipteris*, and *Phylloglossum*. The first belongs to the warm countries of the new world, and is a singular plant with slender dichotomizing stems, very small leaves, and no true roots. *Phylloglossum* is a minute Australian plant, with a small tuber which produces a rosette of a few long leaves and a stalked spike of sporangia. The species of *Lycopodium* (fig. 23) attain a more vigorous vegetative development, some almost reaching the size of small shrubs. Their stems contain an axial cylinder, formed by the greater or less coalescence of a number of fibro-vascular bundles forming transverse bands in cross-section. These bands are composed of xylem, with wide scalariform vessels and spiral vessels at each end; between the xylem plates are the phloem common to each, and containing sieve-tubes. The whole surface is surrounded by a phloem-sheath and a fibro-vascular bundle sheath. The cortical tissue surrounding the axial cylinder is often largely converted into sclerenchyma. The sporangia of *Lycopodium* make their appearance upon the upper surface of the fertile leaves (fig. 24), and, according to Sachs, are developed from the sub-epidermal tissue. The spores are only of one kind (fig. 25), and on germination, according to the observations of Fankhauser, produce a subterranean prothallium, resembling that of *Ophioglossaceæ*, and bearing antheridia and archegonia.

2. *Ligulatæ* includes two orders markedly different in vegetative characters. In both the leaves are furnished at the base with a small appendage called a ligule, wanting in the *Lycopodiaceæ*.

Selaginelleæ.—The ramification of *Selaginella* often produces flat frond-like systems of branches, owing to the regular suppression of one side of the dichotomies. The leaves, which are arranged in four longitudinal rows, are in these cases often unequal, those attached to the under side of the horizontally spreading stem being larger than those on the upper side. The structure of the stem differs from that of *Lycopodium* in having no axial cylinder, the fibro-vascular bundles being distinct from one another although transversely expanded like those of *Lycopodium*. In details of structure they agree with the bundles of ferns. Each is often surrounded by a system of air-cavities. The roots branch dichotomously. The sporangia of *Selaginella* are shortly stalked, and are inserted in the axil or even in the base of a leaf; the fibro-vascular bundle runs beneath it without sending a branch into it. Macrosporangia (fig. 26), containing usually four macrospores, occur in the same spike with the microsporangia. For a detailed account of the prothallial stage (oophore) of *Selaginella* reference may be made to Sachs's text-book. The female prothallium is more distinctly endogenous than even in *Rhizocarpeæ*. It is formed from a portion of the contents of the macrospore (fig. 27), which ruptures partially, exposing the prothallium with its first archegonium. The remaining part of the cavity of the spore becomes filled with a cellular tissue, which may be compared to the endosperm of phanerogams. This is not the only point in which the reproduction of *Selaginella* approaches that of flowering plants. The oospore first divides transversely, in which respect it differs widely from *Filices* and *Rhizocarpeæ*. The upper half forms the *suspensor*, a structure wanting in all other cryptogams, but characteristic of phanerogams. The lower half forms the embryo, which by the elongation of the suspensor is at first carried down into the endosperm (fig. 28), the cells of which it partially absorbs in its further development. The microspores produce the antherozoids, containing, in addition, traces of a rudimentary prothallium.

The *Isoeteæ* consist of the species of the monotypic genus *Isoetes*, which, almost always aquatic in habit, are found all over the world. They are all remarkable for the extraordinarily slow growth in length and absence of branching in the stem, which consists of a small tuberous body bearing the rosette of leaves without internodes. It has the unique peculiarity amongst the vascular cryptogams of increasing in diameter by additions to the parenchymatous cortical tissue external to the central fibro-vascular axis. The sporangia of *Isoetes* are produced at the bases of the leaves, and are unquestionably foliar products; the outer leaves of the rosette produce only macrosporangia, the inner only microsporangia. The macrospores are entirely filled by the female prothallium, the wall being finally ruptured at the apex, as in *Selaginella*.

Reference may be made to the article Biology for a general view of the relations of the reproductive processes in *Pteridophyta* to other *Cormophyta*, and especially phanerogams. See also *A Text-book of Botany, Morphological and Physiological*, by J. Sachs (3d edition), translated by A. W. Bennett and W. T. Thiselton Dyer; *Lehrbuch der Botanik*, von Dr. Julius Sachs, vierte Auflage; *Vergleichende Anatomie der Vegetationsorgane* *der Phanerogamen und Farne*, von Dr. A. de Bary; *Synopsis Filicum*, by Sir W. J. Hooker and J. G. Baker.

(W. T. T. D.—J. G. BA.)

FEROZEPORE. See FIROZPUR.

FERRAND, ANTOINE FRANÇOIS CLAUDE, COMTE (1751–1825), statesman and political writer, was born at Paris July 4, 1751, and entered the Parlement de Paris at the early age of eighteen as "conseiller aux enquêtes." During the Revolution he belonged to the emigrant party, and from 1794 to 1801 led a quiet life at Ratisbon, employing himself in literary work. In 1814 Ferrand was made minister of state and directeur général des postes. It was he who, as ministre du roi, countersigned the act of sequestration of Napoleon's property, and who, in introducing a bill for the restoration of the property of emigrants, established a distinction, since become famous, between royalists of "la ligne droite" and those of "la ligne courbe." At the second restoration, Ferrand became again directeur général des postes. He was also made a peer of France, member of the privy council, grand-officier and secretary of the orders of Saint Michel and Saint Esprit, and in 1816 member of the Academy. In his old age he became blind and enfeebled. He died January 17, 1825.

Besides a large number of political pamphlets, Ferrand is the author of *l'Esprit de l'histoire, ou Lettres d'un père à son fils sur la manière d'étudier l'histoire*, 1802, which reached seven editions, the last number in 1826 having prefixed to it a biographical sketch of the author by his nephew Héricart de Thury; *Éloge historique de Madame Élisabeth de France*, 1814; *Œuvres Dramatiques*, 1817; *Théorie des révolutions rapprochée des événements qui en ont été l'origine, le développement, ou la suite*, 1817; and *Histoire des trois démembrements de la Pologne, pour faire suite a l'Histoire de l'Anarchie de Pologne par Rulhière*, 1820.

FERRARA, a city of Italy, at the head of a circondario and province of the same name, is situated in a flat alluvial district at the junction of the Po di Volano with several minor branches of the complex water-system of lower Lombardy. At the times of greatest inundation the river rises about 7 or 8 feet above the level of the castle court, but the statement that it sometimes even reaches above the level of the roofs is an exaggeration, and the city affords an asylum to the people of the surrounding country when the district is under water. The distance from Bologna by rail is about 29 miles, and from Venice 70. As it long occupied an important strategical position as a frontier post of the papal states, Ferrara is strongly fortified by walls, bastions, ditches, and a pentagonal citadel. Within the circuit of its defences, which extend for nearly 5 miles, a large part of the area is unoccupied. In the very centre of the city stands the old ducal castle or palace, surrounded by a moat, and crowned with heavy machicolations and battlements. During the papal period it was the residence of the legate, and it is now the seat of the local authorities. The cathedral of San Paolo is a large building originally dating from the 12th century, but gutted and restored in the 17th. The west front, of which a view is given in Mr. Street's *Brick and Marble Architecture*, is a great screen with "three gables of about equal height covered with arcading, which increases in depth and richness of moulding and shadow to the top, where there are very fine open arched galleries." Of the other churches it is sufficient to mention S. Francesco, S. Benedetto, S. Domenico, and S. Maria del Vado, which contain paintings by Garofalo, Dosso Dossi, Bonone, and other native artists. The palaces are for the most part of small architectural interest: the *Palazzo de' Diamanti* owes its name merely to the facets into which the stones of the front are carved. The theatre is one of the largest in Italy; and the university, or *Studio Publico*, has a rich numismatic collection and a library of 100,000 volumes and 1100 MSS., numbering among its curiosities autographic portions of Ariosto's *Orlando Furioso*, letters of Tasso, and the original of Guarini's *Pastor Fido*. The house of the first of these poets is still shown in a street which bears his name; and the hospital of S. Anna is regularly visited as the scene of Tasso's incarceration. Almost all the interest of the city lies in its past, but it shows signs of revival since the unification of Italy. A large factory for scutching and spinning hemp was established in 1874; there are two foundries and a small establishment for the manufacture of brass instruments; and the preserving of peaches is a fairly important industry. A local bank was founded in 1862 with a nominal capital of £83,000. Besides the university, which is free, the educational establishments comprise an industrial and professional institute, a technical school, a communal gymnasium, a lyceum named after Ariosto, and a gymnasium and lyceum attached to the archiepiscopal seminary. The population in 1871 was 28,509, or, including the suburbs of San Luca and San Giorgio, 33,327. Ferrara possibly owes its existence to the invasion of Italy by Attila, and the destruction of Aquilea. It was walled by the exarch of Ravenna in 585, and became the seat of a bishop in 657. In the beginning of the 13th century, it passed into the hands of the Este family, which continued to hold it, sometimes under the pope and sometimes as independent lords, till the extinction of the main line by the death of Alphonso II. in 1597. During the latter part of this period Ferrara was the seat of one of the most cultured of the Italian courts, and its name has become for ever associated with the history of Italian literature. Its population is said to have amounted to 80,000. In 1598 it was incorporated with the papal states by Clement VII. During the period of the French supremacy in Italy, it formed part, first of the Cisalpine republic, and secondly of the kingdom of Italy; but the treaty of Vienna restored it to the pope, and granted the Austrians the right of maintaining a garrison. In 1859 it was incorporated in the general kingdom of Italy.

FERRARI GAUDENZIO (1484–1549), a celebrated painter of the Milanese, or more strictly the Piedmontese, school, was born at Valduggia, Piedmont, and learned the elements of painting at Vercelli from Girolamo Giovannone. He next studied in Milan, in the school of Scotto, and some say of Luini; towards 1504 he proceeded to Florence, and afterwards to Rome. His pictorial style may be considered as derived mainly from the old Milanese school, with a considerable tinge of the influence of Da Vinci, and later on of Raphael; in his personal manner there was something of the demonstrative and fantastic. The gentler qualities diminished, and the stronger intensified, as he progressed. Ferrari was again in Rome towards the close of Raphael's life, and is believed to have aided him in the works of Torre Borgia. By 1524 he was at Varallo in Piedmont, and here, in the chapel of the Sacro Monte, the sanctuary of the Piedmontese pilgrims, he executed his most memorable work. This is a fresco of the Crucifixion, with a multitude of figures, no less than twenty-six of them being modelled in actual relief, and colored; on the vaulted ceiling are eighteen lamenting angels, powerful in expression. Other leading examples are the following. In the Royal Gallery, Turin, a Pietà, an able early work. In the Brera Gallery, Milan, St. Katharine miraculously preserved from the Torture of the Wheel, a very characteristic example, hard and forcible in color, thronged in composition, turbulent in emotion; also several frescoes, chiefly from the church of Santa Maria della Pace, three of them being from the history of Joachim and Anna. In the cathedral of Vercelli, the choir, the Virgin with Angels and Saints under an Orange-Tree. In the refectory of San Paolo, the Last Supper. In the Louvre, St. Paul Meditating. In Varallo, convent of the Minorites (1507), Presentation in the Temple, and Christ among the Doctors and (after 1510) the History of Christ, in twenty-one subjects; also an ancona in six compartments, named the Ancona di San Gaudenzio. In Santa Maria di Loreto, near Varallo (after 1527), an Adoration. In the church of San Cristoforo, the transept (in 1532–35), a series of paintings in which Ferrari's scholar Lanini assisted him; by Ferrari himself are the Birth of the Virgin, the Annunciation, the Visitation, the Adoration of the Shepherds and Kings, the Crucifixion, the Assumption of the Virgin, all full of life and decided character, though somewhat mannered. In the church of Saronno, near Milan, the cupola (1535), a Glory of Angels, in which the beauty of the school of Da Vinci alternates with bravura of foreshortenings in the mode of Correggio. In Milan, Santa Maria delle Grazie (1542), the Scourging of Christ, an Ecce Homo, and a Crucifixion. The Scourging, or else a Last Supper, in the Passione of Milan, is regarded as Ferrari's latest work. He was a very prolific painter, distinguished by strong expression, animation and fulness of composition, and abundant invention; he was skilful in painting horses, and his decisive rather hard color is marked by a partiality for shot tints in drapery. In general character, his work appertains more to the 15th than the 16th century. His subjects were always of the sacred order. Ferrari's death took place in Milan. Besides Lanini, already mentioned, Andrea Solario, Giambattista della Cerva, and Fermo Stella were three of his principal scholars. He is represented to us as a good man, attached to his country and his art, jovial and sometimes facetious, but an enemy of scandal. The reputation which he enjoyed soon after his death was very great, but it has not fully stood the test of time. Lomazzo went so far as to place him seventh among the seven prime painters of Italy.

FERREIRA, Antonio (1528–1569), Portuguese poet, was born at Lisbon in 1528. He was of a noble family, and completed his education at the university of Coimbra. Destined for the public service, he applied himself to the study of the law; but although he obtained the degree of doctor, and held a high legal office at Lisbon, he was far more deeply interested in literature than in jurisprudence. The poetry of Horace especially fascinated him; and resolving to write in the Portuguese tongue alone, he set before him as his special task to give to Portuguese poetry a classical purity, precision, and elegance of style. While still at the university he composed most of his *Sonnets*, in which the influence of Petrarch appears, without, however, his passion or his grace. At the same period he produced his comedy of *Bristo*, which he is supposed to have afterwards retouched and perfected. His chief dramatic work is the tragedy of *Inez de Castro*, the first Portuguese tragedy, and the second in modern European literature, the only one of earlier date being the Italian tragedy of *Sofonisba*, by Trissino. Ferreira's elegies are numerous, but few of them bear the impress of sincerity of feeling. One of the most admired is that on "May" and the return of spring. The *Epistles* of Ferreira, forming the largest portion of his works, were the first of their kind in Portuguese literature. They were addressed to many illustrious persons during his residence at court, in the maturity of his powers and knowledge of the world. Usually didactic and serious in tone, studious of correctness and classical elegance of form, the poetry of Ferreira lacked the inspiration of genuine passion and the power to touch the hearts of his countrymen. It never became popular. He was looked up to, however, as an oracle by the critics of his own day, enjoyed the special favor of King John III. and two of his successors, and had reason to hope for a long and honorable career. But he was carried off suddenly in the prime of life by the plague which raged in 1569. His *Poemas Lusitanos* were published in 1598, and a complete collection of his works appeared at Lisbon in 1771.

FERRET (*Mustela furo*), an albino variety of weasel, regarded by some as the descendant of a wild species originally brought from Africa, and now only known in the domesticated state, and by others as a variety of the polecat (*Mustela putorius*), which it closely resembles in size, form, and habits, and with which it is said to interbreed freely. It differs, however, from the polecat in the color of its fur, which is usually yellowish-white, and of its eyes, which are pinky-red. A more important difference, as bearing on the question of its specific distinctness, lies in the fact that while the polecat thrives in the severe climate of northern Europe, the ferret is peculiarly intolerant of cold, and only survives the English winter by means of the artificial warmth to which, under domestication, it is accustomed. The ferret attains a length of about fourteen inches, exclusive of the tail, which measures about five inches. Although exhibiting considerable tameness, it seems incapable of attachment, and when not properly fed, or when otherwise irritated, is apt to give painful evidence of its native ferocity. Tempted by the opportunity of the mother's absence, it has been known to attack the child in the cradle, and having once tasted blood it seems to lose all its acquired shyness, and will then boldly attack any one interfering with the gratification of its bloodthirsty propensity. It is chiefly employed in destroying rats and other vermin, and in driving rabbits from their burrows into nets spread for their reception. For the latter purpose it is usually muzzled, to prevent it devouring its prey and thereafter going to sleep at the bottom of a burrow until roused by hunger to renewed exertion. The ferret is remarkably prolific, the female bringing forth two broods annually, each numbering from six to nine young. It is said to devour its young occasionally immediately after birth, and in this case it produces another brood soon after. The ferret was well known to the Romans, Strabo stating that it was brought from Africa into Spain, and Pliny that it was employed in his time in rabbit-hunting, under the name *Viverra*, of which the English name is probably a corruption.

FERRI, Ciro (1634–1689), a Roman painter, the chief disciple and successor of Pietro da Cortona. He was born in the Roman territory, studied under Pietro, to whom he became warmly attached, and, at an age a little past thirty, completed the painting of the ceilings and other internal decorations begun by his instructor in the Pitti Palace, Florence. He also co-operated in or finished several other works by Pietro, both in Florence and in Rome, approaching near to his style and his particular merits, but with less grace of design and native vigor, and in especial falling short of him in color. Of his own independent productions, the chief is an extensive series of scriptural frescoes in the church of S. Maria Maggiore in Bergamo; also a painting of St. Ambrose, the principal altarpiece in the church of St. Ambrogio della Massima in Rome. The paintings of the cupola of St. Agnese in the same capital might rank even higher than these; but this labor remained uncompleted at the death of Ferri, and was marred by the performances of his successor Corbellini. He executed also a large amount of miscellaneous designs, such as etchings and frontispieces from books; and he was an architect besides. Ferri was appointed to direct the Florentine students in Rome, and Gabbiani was one of his leading pupils. As regards style, Ferri ranks as chief of the so-called Machinists, as opposed to the school founded by Sacchi and continued by Carlo Maratta. He died in Rome —his end being hastened, as it is said, by mortification at his recognized inferiority to Bacciccia in color.

FERRIER, James Frederick (1808–1864), metaphysician, was born in Edinburgh on 16th June, 1808. His father was a writer to the signet, and his grandfather was an intimate friend of Sir Walter Scott. His mother was sister of Professor John Wilson. In his early youth he lived in the family of the Rev. Dr. Duncan, in the manse of Ruthwell, Dumfriesshire, and under Dr. Duncan's tuition he acquired a strong liking for the Latin poets, which remained with him all his days. After attending Edinburgh High School he studied under Dr. Burney at Greenwich, and was a student of Edinburgh University in sessions 1825–26 and 1826–27. He took the B.A. degree at Oxford in 1831. In 1832 he passed as an advocate at Edinburgh. Probably it was his metaphysical tastes which led him to Heidelberg in 1834. These tastes were fostered by his intercourse with Sir William Hamilton, which was always most cordial, notwithstanding their wide differences of opinion. Ferrier himself has recorded the warm friendship which subsisted between himself and Hamilton. "For years together," he wrote, "scarcely a day passed in which I was not in his company for hours, and never on this earth may I expect to live such happy hours again." His admiration for his uncle, John Wilson, whose daughter he married, was unbounded, and he had many opportunities of meeting political and literary celebrities in Wilson's house. In 1842 he was appointed professor of civil history in Edinburgh University. In session 1844–45 he acted as Sir William Hamilton's substitute in the chair of logic and metaphysics, and in 1845 he was elected professor of moral philosophy and political economy at St. Andrews. He was twice an unsuccessful candidate for chairs in Edinburgh, for that of moral philosophy on the resignation of Professor Wilson in 1852, and for that of logic and metaphysics in 1856, after Hamilton's death. As a professor Ferrier had immense influence over his students, and was warmly beloved by them. He had an attack of *angina pectoris* in November, 1861, from the effects of which he never recovered. He died on 11th June, 1864.

Ferrier made his début as a metaphysician in a series of articles in *Blackwood* in the years 1838–39, bearing the title "An Introduction to the Philosophy of Consciousness." In these articles he condemns previous philosophers for ignoring in their psychological investigations the fact of consciousness, which is the distinctive feature of man, and confining their observation to the so-called "states of the mind." By doing so, he says, they allowed freedom, will, morality, and all man's peculiar attributes to crumble away It is wrong to apply the method of physical research to the problems of psychology, for the psychologist must *act* or *create* the great phenomenon which he has to observe. Consciousness only comes into manifestation when the man has used the word "I" with full knowledge of what it means. This notion he must originate within himself. Consciousness cannot spring from the states which are its object, for it is in antagonism to them. It originates in the will, which in the act of consciousness puts the "I" in the place of our sensations. Morality, conscience, and responsibility are necessary results of consciousness.

A number of articles on philosophical subjects intervened between the above and the publication of the *Institutes.* The "Crisis of Modern Speculation," contributed in 1841, is a decided advance upon his earlier articles, and evinces a more correct appreciation of the particular element in thought. He there states the problem of philosophy to be the nature of the connection between the mind of man and the external universe, and he solves the question, not by giving it a positive answer, but by changing its aspect. The question as formerly put becomes under his hands meaningless, for mind and universe, subject and object, are shown to be not two, but merely moments in one reality. Think the object, and it becomes subject-object. Think the subject, and it becomes subject-object. So that the question really asked is, "What is the connection between the subjective subject-object and the objective subject-object?" "What is the connection between *one* thing which thought cannot construe as really two?" As results of this mode of stating the question, to which the mere thinking it necessarily leads, perception is removed from the sphere of cause and effect, and the grounds of dogmatic realism and dogmatic idealism are subverted. "Berkeley and Idealism" (1842) is a further exposition of absolute idealism, and contains some foreshadowings of the later teachings of the *Institutes* on the subject of "Agnoiology."

In an article on the publication of Hamilton's edition of Reid (1847), which contains a vigorous attack on the philosophy of common sense, the perception of matter is pronounced to be the *ne plus ultra* of thought, and Reid, for presuming to analyze it, is declared to be a representationist in fact, although he professed to be an intuitionist. A distinction is made between the "perception of matter" and "our apprehension of the perception of matter." Psychology vainly tries to analyze the former. Metaphysic shows the latter alone to be analyzable, and separates the subjective element, "our apprehension," from the objective element, "the perception of matter,"—not matter *per se,* but the perception of matter is the existence independent of the individual's thought. It cannot, however, be independent of thought. It must belong to some mind, and is therefore the property of the Divine Mind. There, he thinks, is an indestructible foundation for the *a priori* argument for the existence of God.

Ferrier's matured philosophical doctrines find expression in the *Institutes of Metaphysics.* Therein he claims to have met the twofold obligation resting on every system of philosophy, that it should be reasoned and true. His method is that of Spinoza, strict demonstration, or at least an attempt at it. All the errors of natural thinking and psychology must fall under one or other of three topics:—Knowing and the Known, Ignorance, and Being. These are all comprehensive, and are therefore the departments into which philosophy is divided; for the sole end of philosophy is to correct the inadvertencies of ordinary thinking. Hence it must be polemical.

The problems of knowing and the known are treated in the "Epistemology or Theory of Knowing," under a series of twenty-two propositions and counter-propositions. Each proposition contains a philosophic truth, and the corresponding counter-proposition expresses the error of ordinary thinking regarding it. The truth that *along with whatever any intelligence knows it must, as the ground or condition of its knowledge, have some cognizance of itself* is the basis of the whole philosophical system; and, variously stated through a series of propositions, it leads to the conclusion that the only independent universe which any mind can think of is the universe in synthesis with some *other* mind or *ego.*

The leading contradiction which is corrected in the "Agnoiology or Theory of Ignorance" is this, that there can be an ignorance of that of which there can be no knowledge. *Ignorance is a defect.* But there is no defect in not knowing what cannot be known by any intelligence, and therefore there can be an ignorance only of that of which there can be a knowledge, *i.e.,* of some-object-*plus*-some-subject. Ferrier lays special claim to originality for this division of the *Institutes.*

The "Ontology or Theory of Being" forms the third and final division of the *Institutes.* It contains a discussion of the origin of knowledge, in which Ferrier traces all the perplexities and errors of philosophers to the assumption of the absolute existence of matter. The conclusion arrived at is that the only true real and independent existences are minds-together-with-that-which-they-apprehend, and that the one strictly necessary absolute existence is a supreme and infinite and everlasting mind in synthesis with all things.

Ferrier's works are perhaps the best propædeutic to the study of metaphysics in the English language. He has Berkeley's charm of style, while he surveys philosophical questions from a more advanced standpoint. His philosophic insight was true from the first. Notwithstanding his disavowal of any indebtedness to the German philosophers, his writings are imbued with the spirit of German metaphysics; and he has the merit of being the first to question the right of Dr. Reid and his school to dominate the thought of Scotland. Others have arisen more potent than he to read the riddle of the great German he admired so much; yet those who seek a knowledge of the philosophy of the absolute will do wisely not to neglect the works of Ferrier.

A collected edition of Ferrier's philosophical works, edited by his son-in-law Sir Alexander Grant, and Professor E. L. Lushington, was published in 1866. This edition contains Ferrier's earlier contributions to *Blackwood,* a few miscellaneous lectures, the biographies of Schelling and Hegel contributed to the *Imperial Dictionary of Universal Biography,* some papers supplementary to the *Institutes of Metaphysics,* and the lectures in Greek philosophy which he delivered to his class. In 1875 there was brought out a three-volume edition of Ferrier's philosophical works, including, along with the above, the *Institutes of Metaphysics,* of which two editions had been published in the author's life-time, one in 1854 and a second in 1856. (D. B.)

FERRIER, SUSAN EDMONSTON (1782-1854), Scottish novelist, born in Edinburgh in 1782, was the aunt of the subject of last notice. Her father was James Ferrier, for some years factor to the duke of Argyll, and at one time one of the clerks of the court of session with Sir Walter Scott. Her mother was a Miss Coutts, the beautiful daughter of a Forfarshire farmer. Miss Ferrier's first novel, *Marriage,* was begun in concert with a friend, Miss Clavering, granddaughter of the duke of Argyll; but this lady soon relinquished her share in the work, and *Marriage,* completed by Miss Ferrier alone, appeared in 1818, when its authoress was between five and six and thirty. It was followed in 1824 by *The Inheritance,* a better constructed and more mature work; and the last and perhaps best of her novels, *Destiny,* dedicated to Sir Walter Scott (who himself undertook to strike the bargain with the publisher Cadell), appeared in 1831. All these novels were published anonymously; but, with their clever portraiture of contemporary Scottish life and manners, and even recognizable caricatures of some social celebrities of the day, they could not fail to become popular north of the Tweed, and many were the conjectures as to their authorship, which was by some attributed to Scott himself. Thus, in the *Noctes Ambrosianæ* (November, 1826), the Shepherd mentions *The Inheritance,* and adds, "which I aye thought was written by Sir Walter, as weel's *Marriage,* till it spunked out that it was written by a leddy." Scott himself gave Miss Ferrier a very high place indeed among the novelists of the day. In his diary (March 27, 1826), criticising a new work which he had been reading, he says, "The women do this better. Edgeworth, Ferrier, Austen, have all given portraits of real society far superior to anything man, vain man, has produced of the like nature." Another friendly recognition of Miss Ferrier is to be found at the conclusion of his *Tales of my Landlord,* where Scott calls her his "sister shadow," the still anonymous author of "the very lively work entitled *Marriage.*"

Lively, indeed, all Miss Ferrier's works are,—written in a clear, brisk English, and with an inexhaustible fund of humor. It is true her books portray the eccentricities, the follies, and foibles of the society in which she lived, caricaturing with terrible exactness its hypocrisy, boastfulness, greed, affectation, and undue subservience to public opinion. Yet Miss Ferrier wrote less to reform than to amuse. With an honest aversion to these things herself, she wished, not to lecture her readers, but to laugh with them. In this she is less like Miss Edgeworth than Miss Austen. Miss Edgeworth was more of a moralist; her wit is not so involuntary, her caricatures not always so good-natured. But Miss Austen and Miss Ferrier were genuine humorists, and with Miss Ferrier especially a keen sense of the ludicrous was always dominant. She could be serious, she could be pathetic, she could even touch some of the finest chords in human nature; but she never interfered with the depths of human wickedness and misery. She liked best to laugh; she turned naturally to the humorous, and her humorous characters are always her best. It was no doubt because she felt this that in the last year of her life she regretted not having devoted her talents more exclusively to the service of religion, not taking into account then how much good she had involuntarily done, and how much harmless pleasure she had distributed about her; for, if she was not a moralist, neither was she a cynic; and her wit, even where it is most caustic, is never uncharitable.

Miss Ferrier lived till 1854, more than twenty years after the publication of her last work. The most pleasant picture that we have of her is in Lockhart's description of her visit to Scott in May, 1831. She was asked there to help to amuse the dying master of Abbotsford, who, when he was not writing *Count Robert of Paris*, would talk as brilliantly as ever. Only sometimes, before he had reached the point in a narrative, "it would seem as if some internal spring had given way." He would pause, and gaze blankly and anxiously round him. "I noticed," says Lockhart, "the delicacy of Miss Ferrier on such occasions. Her sight was bad, and she took care not to use her glasses when he was speaking; and she affected to be also troubled with deafness, and would say, 'Well, I am getting as dull as a post; I have not heard a word since you said so-and-so,'—being sure to mention a circumstance behind that at which he had really halted. He then took up the thread with his habitual smile of courtesy—as if forgetting his case entirely in the consideration of the lady's infirmity."

Miss Ferrier died, November 5, 1854, at her house No. 38 Albany Street, Edinburgh. She left among her papers a short unpublished article, entitled "Recollections of Visits to Ashestiel and Abbotsford." This is her own very interesting account of her long friendship with Sir Walter Scott, from the date of her first visit to him and Lady Scott at Ashestiel, where she went with her father in the autumn of 1811, to her last sad visit to Abbotsford in 1831. It contains some impromptu verses written by Scott in her album at Ashestiel.

FERRO, or HIERRO. See CANARY ISLANDS, vol. iv. p. 706.

FERROL, a seaport town of Spain, province of Coruña, is situated on the northern arm of the bay of Belanzos, 12 miles N.E. of Coruña. The town is divided into three parts, the old, the new, and the "esteiro." The old town is very irregular, but the new town is a parallelogram of seven streets in width, by nine in length, intersecting each other at right angles. It has two squares, in one of which is a fountain, erected in 1812 in honor of Cosme Churruca, a naval officer killed at Trafalgar. Ferrol is invisible from the sea, and is so strongly fortified that it is considered impregnable. Its arsenal is one of the three largest in the kingdom, and along with the wharves and dockyards exceeds 23 acres in extent. The dockyard is divided into a smaller outward and a larger inward portion. Behind the inner dock are the dwellings of the operatives, and in the north angle are the foundries, ropeworks, and magazines. On the dockyard 15 ships of the line can be built at one time. Connected with the arsenal is a school for engineering, and also a marine observatory. The harbor, which is one of the best in Europe, is deep, capacious, and secure; but the entrance, which is a strait about two miles in length, admits at the narrowest part only one ship at a time, and is commanded by forts Palma and San Felipe on opposite sides. The chief industries of the town are rope-making, sail-making, and the manufacture of leather. It contains two hospitals, three large churches, a monastery, a consistory, a prison, and a naval barracks with accommodation for 6000 men. The population in 1860 was 21,120.

Until 1752 Ferrol was a mere fishing village, but in that year Ferdinand VI. began to fit it for becoming an arsenal. In 1799 the English made a fruitless attempt to capture it, but on the 4th November, 1805, they defeated the French fleet in front of it and compelled its surrender. On the 27th January, 1809, it was through treachery delivered over to the French, but it was vacated by them on the 22d July of the same year. On the 15th July, 1823, another blockade was begun by the French, and it surrendered to them on the 27th August.

FERRY, in the law of England, is the right of carrying by boat across a river or arm of the sea, and of exacting a reasonable toll for such carriage. It belongs, like the right of fair and market, to the class of rights called in English law franchises. It origin must be by statute, royal grant, or prescription. It is wholly unconnected with the ownership or occupation of land, so that the owner of the ferry need not be proprietor of the soil on either side of the water over which the right is exercised. He is bound to maintain safe and suitable boats ready for the use of the public, and to employ fit persons as ferrymen. As a correlative of this duty he has a right of action, not only against those who evade or refuse payment of toll when it is due, but against those also who disturb his franchise by setting up a new ferry, so as to diminish his custom. In Scotland the law is similar. There ferries are either public or private. Public ferries are under the management of the trustees of the roads connected with them, or of the justices of the peace of the county, or are regulated by special Acts of Parliament. Private ferries are those which have been granted by the crown to private individuals. They are acquired either by direct grant or by prescription. A new ferry calculated to affect the old one injuriously is illegal in Scotland as in England. A neighboring proprietor may make use of his boats to transport himself, his family, servants, visitors, and workmen, but he may not carry other persons, even gratuitously.

FERSEN, AXEL, COUNT (1755–1810), marshal of the kingdom of Sweden, was born at Stockholm, September 4, 1755. He belonged to an old Livonian family, several members of which had attained distinction during the reigns of Queen Christina, Charles X., and Charles XI. He was educated by his father Count Axel, a senator of Sweden under Gustavus III., and afterward studied at the military academy of Turin. In 1775 he returned to Sweden and entered the army. Four years later he went to France, and was appointed colonel of the royal regiment of Swedes in the service of Louis XVI. At the head of this regiment he served with distinction in the later campaigns of the American war, and was aide-de-camp to General Rochambeau at Yorktown. After visiting England and Italy he returned to France, and on the outbreak of the Revolution he showed himself the devoted friend of the royal family. When their flight from Paris was arranged, Count Fersen consented to play the part of coachman in disguise; and he conducted them to the post of Bondi, whence they were sent on under other care. After the failure of the scheme and the imprisonment of the royal family, he zealously exerted himself to minister in any way possible to their comfort and relief. Compelled to leave France after the execution of the king and queen, he visited Vienna, Dresden, and Berlin, and then returned to Sweden. He was named by the king grand-master of his household, chancellor of the university of Upsala, and marshal of the kingdom. He was soon after sent as plenipotentiary to the congress of Rastadt. But he was at the same time disliked and suspected by the people, and when the crown prince, Christian of Augustenburg, suddenly died, in June, 1810, suspicions fastened on him and his sister the Countess Piper of having taken part with others in poisoning the prince. At the funeral they were assailed by the crowd; the marshal sought refuge in a house, but was slain by the mob, and his body exposed in the great square (June 20, 1810). His sister succeeded in making her escape. The complete innocence of Count Fersen and his family was established by a subsequent judicial investigation.

FESCA, FREDERIC ERNEST (1789–1826), violinist and composer of instrumental music, was born February 15, 1789, at Magdeburg, where he received his early musical education from Lohse and Zachariä. He completed his studies at Leipsic under Eberhard Müller, and at the early age of fifteen appeared before the public with several concerti for the violin, which were received with general applause, and resulted in his being appointed leading violinist of the Leipsic orchestra. This position he occupied till 1806, when he became concert-master to the duke of Oldenburg. In 1808 he was appointed solo-violinist by King Jerome of Westphalia at Cassel, and there he remained till the end of the French occupation (1814), when he went to Vienna, and soon afterwards to Carlsruhe, having been appointed concert-master to the grand-duke of Baden. His failing health prevented him from enjoying the numerous and well-deserved triumphs he owed to his art, and in 1826 he died of consumption at the early age of thirty-seven. As a virtuoso Fesca is amongst the best masters of the German school of violinists, the school subsequently of Spohr and of Joachim. Especially as leader of a quartet he is said to have been unrivalled with regard to classic dignity and simplicity of style. Amongst his compositions, his quartets for stringed instruments and other pieces of chamber music are the most remarkable. His two operas, *Cantemira* and *Omar and Leila*, were less successful, lacking dramatic power and originality. He also wrote some sacred compositions, and numerous songs and vocal quartets.

FESCH, JOSEPH (1763–1839), cardinal, archbishop of Lyons, was born at Ajaccio, in Corsica, January 3, 1763, six years before the island was conquered by the French. His father, Francis Fesch, of Basel, was a Swiss officer in the service of Genoa, who had married as his second wife a young widow, the mother of Letizia Bonaparte. Joseph Fesch was thus half-brother to Letizia, and uncle to her son Napoleon Bonaparte. He was educated at the seminary of Aix in Provence, took holy orders, and became archdeacon and provost of the chapter of Ajaccio. When the French Revolution broke out, and the chapters were suppressed, Fesch protested against the civil constitution of the clergy, and laid aside his clerical dress. In 1793 he had to quit Corsica, followed the Bonapartes to Toulon, and obtained a post in the army administration. In 1795 he was named commissary of war in the army of Italy, of which his nephew Napoleon Bonaparte became commander-in-chief. After the 18th Brumaire (November 9, 1799) he resumed his ecclesiastical functions, and took part in the negotiations which led up to the concordat of 1801. In the following year he was consecrated archbishop of Lyons, and early in 1803 received a cardinal's hat. Napoleon having been proclaimed emperor, and desiring to be crowned at Paris by the pope, Cardinal Fesch was sent as ambassador to Rome to treat with Pius VII. respecting this project. He was received with much distinction, won the pope's good opinion, and brought the negotiations to a successful issue. On this occasion the cardinal had for his secretary the viscount de Chateaubriand, who had just made himself famous by the publication of his *Génie du Christianisme.* The association, however, was not a happy one. Cardinal Fesch accompanied Pius VII. to Paris, and took part in all the ceremonies of the coronation of his uncle. In reward for his services at Rome he was made grand-almoner of France, grand-cordon of the Legion of Honor, and senator. In 1806 he was chosen coadjutor and successor of Dalberg, prince-primate of the confederation of the Rhine, and arch-chancellor of the empire, and received a large annual subvention. The dissensions which continued between Napoleon and the holy see made the cardinal's position a very difficult one; but he resisted the violent measures taken by the emperor against the pope; and when, in 1809, the emperor desired to have one of his kindred head of the French church, and offered to Fesch the archbishopric of Paris, he declined the offer. He refused even to accept the administration of the diocese. As president of the national ecclesiastical council held at Paris in 1810, he boldly put forward views which gave offence to the emperor and lost him his favor. He was sent back to his diocese, and in consequence of his letter to the pope, then at Fontainebleau, he was deprived of his subvention. In 1814 he withdrew to Rome, but returned to France and his see during the Hundred Days. He was created a peer, but never sat in the chamber. After Waterloo he returned to Rome, and there spent the remaining years of his life in the enjoyment of his vast wealth and his accumulated art-treasures. He died at Rome, May 13, 1839. His correspondence with Napoleon was published by Du Casse in 1855.

FESSLER, IGNAZ AURELIUS (1756–1839), a celebrated Hungarian ecclesiastic, historian, and freemason, was born on the 18th May, 1756, at the village of Zurány in the county of Moson. His mother, who was a pious Roman Catholic, made every effort to secure for him a strict religious education. On the 9th July, 1773, he joined the order of Capuchins as a novice, and in the following year he took the monastic vows, assuming the name of Innocentius. After living in disagreement with his superiors in different monasteries he was transferred to the Capuchin house at Vienna; and while there, by means of a private letter, he drew the attention of the emperor Joseph II. to the irregularities of the monasteries. The searching investigation which followed raised up against him many implacable enemies. Released from the monastery by an imperial decree, he was in 1784 appointed professor of Oriental languages and hermeneutics in the university of Lemberg. In 1787 he brought out his tragedy of *Sidney*, which his enemies attacked so violently as profane and revolutionary that they compelled him to resign his office and seek refuge in Silesia. In Breslau he met with a cordial reception from Korn the publisher, and was, moreover, subsequently employed by the prince of Carolath as tutor to his sons. In 1791 Fessler was converted to Protestantism, and in 1796 he went to Berlin, where he founded a humanitarian society, and was commissioned by the freemasons of that city to assist Fichte in reforming the statutes and ritual of their lodge. He soon after this obtained a Government appointment in connection with the newly-acquired Polish provinces, but in consequence of the battle of Jena (1806) he lost this office, and remained in very needy circumstances until 1809, when he was summoned to St. Petersburg by Alexander I., to fill the post of court councillor and the professorship of Oriental languages and philosophy at the Alexander-Newski Academy. This office, however, he was soon obliged to resign, owing to his alleged atheistic tendencies, but he was subsequently nominated a member of the legislative commission. In 1815 he was deprived of his salary, but it was restored to him in 1817. In November, 1819, he was appointed consistorial president of the Protestant communities at Saratov, and subsequently became chief superintendent of the Lutheran communities in St. Petersburg. Fessler's numerous works are all written in German. In recognition of his important services to Hungary as an historian, he was in 1831 elected a corresponding member of the Hungarian Academy of Sciences. He died at St. Petersburg, December 15, 1839, in the 84th year of his age. His most important works are—*Die Geschichten der Ungarn und ihrer Landsassen*, 10 vols., Leipsic, 1815–25; *Marcus Aurelius*, 3 vols., Breslau, 1790–92 (3d edition, 4 vols., 1799); *Aristides und Themistokles*, 2 vols., Berlin, 1792 (3d edition, 1818); *Attila, König der Hunnen*, Breslau, 1794; *Mathias Corvinus*, 2 vols., Breslau, 1793–94; and *Dei drei grossen Könige der Hungarn aus dem Arpadischen Stamme*, Breslau, 1808.

See Fessler's *Rückblicke auf seine siebzigjährige Pilgerschaft*, Breslau, 1824 (2d edition, Leipsic, 1851).

FESTIVALS. A festival or feast[1] is a day or series of days specially and publicly set apart for religious observances. Whether its occurrence be casual or periodic, whether its ritual be grave or gay, carnal as the orgies of Baal and Astarte or spiritual as the worship of a Puritan Sabbath, it is to be regarded as a festival or "holy day" as long as it is professedly held in the name of religion.

To trace the festivals of the world through all their variations would be to trace the entire history of human religion and human civilization. Where no religion is, there can of course be no feasts; and without civilization any attempt at festival-keeping must necessarily be fitful and comparatively futile. But as religion develops, festivals develop with it, and assume their distinctive character; and an advancing civilization, at least in its earlier stages, will generally be found to increase their number, enrich their ritual, fix more precisely the time and order of their recurrence, and widen the area of their observance.

Some uncivilized tribes, such as the Juángs of Bengal, the Fuegians, and the Andamanese, have been described as having no word for God, no idea of a future state, and consequently no religious ceremonies of any kind whatever. But such cases, doubtful at the best, are confessedly exceptional. In the vast majority of instances observed and recorded, the religiosity of the savage is conspicuous. Even when incapable of higher manifestations, it can at least take the form of reverence for the dead; the grave-heap can become an altar on which offerings of food for the departed may be placed, and where in acts of public and private worship the gifts of survivors may be accompanied with praises and with prayers. That the custom of ghost-propitiation by some sort of sacrifice is even now very widely diffused among the lower races at least, and that there are also many curious "survivals" of such a habit to be traced among highly civilized modern nations, has been abundantly shown of late by numerous collectors of folk-lore and students of sociology; and indications of the same phenomena can be readily pointed out in the Rig-Veda, the Zend-Avesta, and the Pentateuch, as well as in the known usages of the ancient Egyptians, Greeks, and Romans.[1] In many cases the ceremonial observed is of the simplest; but it ever tends to become more elaborate; and above all it calls for repetition, and repetition, too, at regular intervals. Whenever this last demand has made itself felt, a calendar begins to take shape. The simplest calendar is obviously the lunar. "The Naga tribes of Assam celebrate their funeral feasts month by month, laying food and drink on the graves of the departed." But it soon comes to be combined with the solar. Thus the Karens, "while habitually making oblations, have also annual feasts for the dead, at which they ask the spirits to eat and drink." The natives of the Mexican valley in November lay animals, edibles, and flowers on the graves of their dead relatives and friends. The common people in China have a similar custom on the arrival of the winter solstice. The ancient Peruvians had the custom of periodically assembling the embalmed bodies of their dead emperors in the great square of the capital to be feasted in company with the people. The Athenians had their annual Νεκύσια or Νεμέσεια, and the Romans their *Feralia* and *Lemuralia*. The Egyptians observed their three "festivals of the seasons," twelve "festivals of the month," and twelve "festivals of the half month," in honor of their dead. The Parsees, too, were required to render their afringans (blessings which were to be recited over a meal to which an angel or the spirit of a deceased person was invited) at each of the six seasons of the year, and also on certain other days.[2]

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[1] "To feast" is simply to keep a festum or festival. The etymology of the word is uncertain; but probably it has no connection with ἑστιᾶν.

In the majority of recorded instances, the religious feeling of the savage has been found to express itself in other forms besides that of reverence towards the dead. The oldest literatures of the world, at all events, whether Aryan or Semitic, embody a religion of a much higher type than ancestor worship. The hymns of the Rig-Veda, for example, while not without traces of the other, yet indicate chiefly a worship of the powers of nature, connected with the regular recurrence of the seasons. Thus in iv. 57 we have a hymn designed for use at the commencement of the ploughing time;[3] and in the *Aitareya-Brâhmana*, the earliest treatise on Hindu ceremonial, we already find a complete series of sattras or sacrificial sessions exactly following the course of the solar year. They are divided into two distinct sections, each consisting of six months of thirty days each. The sacrifices are allowed to commence only at certain lucky constellations and in certain months. So, for instance, as a rule, no great sacrifice can commence during the sun's southern progress. The great sacrifices generally take place in spring, in the months of April and May.[4] In the Parsee Scriptures[5] the year is divided into six seasons or gahanbârs of two months each, concluding with February, the season at which "great expiatory sacrifices were offered for the growth of the whole creation in the last two months of the year." We have no means of knowing precisely what were the arrangements of the Phœnician calendar, but it is generally admitted that the worship was solar, the principal festivals taking place in spring and in autumn. Among the most characteristic celebrations of the Egyptians were those which took place at the *ἀφανισμός* or disappearance of Osiris in October or November, at the search for his remains, and their discovery about the winter solstice, and at the date of his supposed entrance into the moon at the beginning of spring. The Phrygian festivals were also arranged on the theory that the deity was asleep during the winter and awake during the summer; in the autumn they celebrated his retiring to rest, and in spring with mirth and revelry they roused him from his slumbers.[6] The seasonal character of the Teutonic Ostern, the Celtic Beltein, and the Scandinavian Yule is obvious. Nor was the habit of observing such festivals peculiar to the Aryan or the Semitic race. The Mexicans, who were remarkable for the perfection of their calendar (see vol. i. 610), had also an elaborate system of movable and immovable feasts distributed over the entire year; the principal festivals, however, in honor of their chiefs gods, Tezcatlipoca, Huitzilopochtli, and Tlaloc, were held in May, June, and December. Still more plainly connected with the revolutions of the seasons was the public worship of the ancient Peruvians, who, besides the ordinary feast at each new moon, observed four solar festivals annually. Of these the most important was the Yntip-Raymi (Sun-feast), which, preceded by a three days' fast, began with the summer solstice, and lasted for nine days. Its ceremonies have been often described. A similar but less important festival was held at the winter solstice. The Cusqui-Raymi, held after seed-time, as the maize began to appear, was celebrated with sacrifices and banquets, music and dancing. A fourth great festival, called Citua, held on the first new moon after the autumnal equinox, was preceded by a strict fast and special observances intended for purposes of purification and expiation, after which the festivities lasted until the moon entered her second quarter.

Greek Festivals.—Perhaps the annual Attic festival in honor of Erechtheus alluded to in the *Iliad* (ii. 550) ought to be regarded as an instance of ancestor-worship; but the seasonal character of the *ἑορτή* or new-moon feast in *Od.*, xx. 156, and of the *θαλύσια* or harvest-festival in *Il.*, ix. 533, is generally acknowledged. The older Homeric poems, however, give no such express indications of a fully-developed system of festivals as are to be met with in the so-called "Homeric" hymns, in the *Works and Days* of Hesiod, in the pages of Herodotus, and so abundantly in most authors of the subsequent period; and it is manifest that the calendar of Homer or even of Herodotus must have been a much simpler matter than that of the Tarentines, for example, came to be, of whom we are told by Strabo that their holidays were in excess of their working days. Each demos of ancient Greece during the historical period had its own local festivals (*ἑορταὶ δημοτικαί*), often largely attended and splendidly solemnized, the usages of which, though essentially alike, differed very considerably in details. These details have in many cases been wholly lost, and in others have reached us only in a very fragmentary state. But with regard to the Athenian calendar, the most interesting of all, our means of information are fortunately very copious. It included some 50 or 60 days on which all business, and especially the administration of justice, was by order of the magistrates suspended. Among these *ἱερομηνίαι* were included—in Gamelion (January), the *Lenœa* or wine-press feast in honor of Dionysus; in Anthesterion (February), the *Anthesteria*, also in honor of Dionysus, lasting three days (Pithoigia, Choes, and Chutroi); the *Diasia* in honor of Zeus, and the lesser *Eleusinia*; in Elaphebolion (March), the *Pandia* of Zeus, the *Elaphebolia* of Artemis, and the greater *Dionysia*; in Munychion, the *Munychia* of Artemis as the moon goddess (Μουνυχία) and the *Delphinia* of Apollo; in Thargelion (May), the *Thargelia* of Apollo and the *Plynteria* and *Callynteria* of Athene; in Skirophorion (June), the *Diipolia* of Zeus and the *Skirophoria* of Athene; in Hekatombaion hecatombs were offered to Apollo the summer-god, and the *Cronia* of Cronus and the *Panathenœa* of Athene were held; in Metageitnion, the *Metageitnia* of Apollo; in Boedromion, the *Boedromia* of Apollo the helper,[7] the *Nekusia* or *Nemeseia* (the festival of the dead), and the greater *Eleusinia*; in Pyanepsion, the *Pyanepsia* of Apollo, the *Oschophoria* of Dionysus (probably), the *Chalkeia* or *Athenœa* of Athene, the *Thesmophoria* of Demeter, and the *Apaturia*; in Maimakterion, the *Maimakteria* of Zeus; and in Poseideon (December), the lesser *Dionysia*.

Of these (for the more important of which reference is made to the separate articles) some are commemorative of historical events, and one at least may perhaps be regarded as a relic of ancestor-worship; but the great majority are nature-festivals, associating themselves in the manner that has already been indicated with the phenomena of the seasons, the equinoxes, and the solstices.[1] In addition to their numerous public festivals, the Greeks held various family celebrations, also called ἑορταί, in connection with weddings, births, and similar domestic occurrences. The great national πανηγύρεις—Olympian, Pythian, Nemean, and Isthmian—will be found under separate headings.

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[1] See Spencer, *Principles of Sociology*, i. 170, 280, 306.

[2] Haug, *Parsis*, 224, 225.

[3] "May the heavens, the waters, the firmament, be kind to us; may the lord of the field be gracious to us. . . . May the oxen (draw) happily, the men labor happily; may the traces bind happily, wield the goad happily" (Wilson's translation, iii. 224).

[4] See Haug's *Aitareya-brâhmanam of the Rig-Veda*; Max Müller's *Chips from a German Workshop*, i. 115.

[5] Visperad. See Haug, *Parsis*, 192; Richardson's *Dissertation on the Language, etc., of Eastern Nations*, p. 184; Morier's *Journey through Persia*.

[6] Plutarch, *De Iside et Osiride*; Macrobius, *Saturnalia*, i. 21.

[7] In this month the anniversaries of the battle of Marathon, and of the downfall of the thirty tyrants, were also publicly celebrated.

Roman Festivals.—For the purpose of holding comitia and administering justice, the days of the Roman year were regarded as being either dies fasti or dies nefasti—the dies fasti being the days on which it was lawful for the prætors to administer justice in the public courts, while on the dies nefasti neither courts of justice nor meetings of comitia were allowed to be held. Some days were fasti during one portion and nefasti during another; these were called dies intercisi. For the purposes of religion a different division of the year was made; the days were treated as festi or as profesti,—the former being consecrated to acts of public worship, such as sacrifices, banquets, and games, while the latter (whether fasti or nefasti) were not specially claimed for religious purposes. The dies festi or feriæ publicæ[2] were either stativæ, conceptivæ, or imperativæ. The stativæ were such as were observed regularly, each on a definite day; the conceptivæ were observed annually on days fixed by the authorities for the time being; the imperativæ were publicly appointed as occasion called for them. In the Augustan age the feriæ stativæ were very numerous, as may be seen from what we possess of the *Fasti* of Ovid. The number was somewhat fluctuating. Festivals frequently fell into desuetude or were revived, were increased or diminished, were shortened or prolonged at the will of the emperor, or under the caprice of the popular taste. Thus Augustus restored the Compitalia and Lupercalia; while Marcus Antoninus in his turn found it expedient to diminish the number of holidays.

The following is an enumeration of the stated festivals as given by Ovid and contemporary writers. The first day of January was observed somewhat as is the modern New Year's Day: clients sent presents to their patrons, slaves to their masters, friends and relations to one another. On the 9th the *Agonalia* were held, apparently in honor of Janus. On the 11th the *Carmentalia* were kept as a half-holiday, but principally by women; so also on the 15th. On the 13th of February were the *Faunalia*, on the 15th the *Lupercalia*, on the 17th the *Quirinalia*, on the 18th the *Feralia*, on the 23d (at one time the last day of the Roman year) the *Terminalia*, on the 24th the *Regifugium* or *Fugalia*, and on the 27th the *Equiria* (of Mars). On the 1st of March were the *Matronalia*, on the 14th a repetition of the *Equiria*, on the 15th the festival of Anna Perenna, on the 17th the *Liberalia* or *Agonalia*, and from the 19th to the 23d the *Quinquatria* (of Minerva). On the 4th of April were the *Megalesia* (of Cybele), on the 12th the *Cerealia*, on the 21st the *Palilia*, on the 23d the *Vinalia*, on the 25th the *Robigalia*, and on the 28th the *Floralia*. The 1st of May was the festival of the Lares Præstites; on the 9th, 11th, and 13th the *Lemuria* were celebrated; on the 12th the *Ludi Martiales*, and on the 15th those of Mercury. June 5 was sacred to Semo Sancus; the *Vestalia* occurred on the 9th, the *Matralia* on the 11th, and the *Quinquatrus Minusculæ* on the 13th. The *Ludi Apollinares* were on the 5th, and the *Neptunalia* on the 23d of July. On the 13th of August were the *Nemoralia*, in honor of Diana; on the 18th the *Consualia*, on the 19th the *Vinalia Rustica*, and on the 23d the *Vulcanalia*. The *Ludi Magni*, in honor of Jupiter, Juno, and Minerva, began on September 4. The *Meditrinalia* (new wine) were on the 11th of October, the *Faunalia* on the 13th, and the *Equiria* on the 15th. The *Epulum Jovis* was on 13th November. The December festivals were—on the 5th *Faunalia*, and towards the close *Opalia*, *Saturnalia*, *Larentalia*.

The calendar as it stood at the Augustan age was known to contain many comparatively recent accessions brought in under the influence of two "closely allied powers, the foreign priest and the foreign cook" (Mommsen). The Megalesia, for example, had been introduced 204 B.C. The Ludi Apollinares could not be traced further back than 208 B.C. The Floralia and Cerealia had not come in much earlier. Among the oldest feasts were undoubtedly the Lupercalia, in honor of Lupercus, the god of fertility; the Equiria, in honor of Mars; the Palilia; the great September festival; and the Saturnalia.

Among the feriæ conceptivæ were the very ancient feriæ Latinæ, held in honor of Jupiter on the Alban Mount, and attended by all the higher magistrates and the whole body of the senate. The time of their celebration greatly depended on the state of affairs at Rome, as the consuls were not allowed to take the field until they had held the Latinæ, which were regarded as days of a sacred truce. The feriæ sementivæ were held in the spring, and the Ambarvalia in autumn, both in honor of Ceres. The Paganalia of each pagus and the Compitalia of each vicus were also conceptivæ. Of feriæ imperativæ,—that is to say, festivals appointed by the senate, or magistrates, or higher priests to commemorate some great event or avert some threatened disaster,—the best known is the Novendiale, which used to be celebrated as often as stones fell from heaven (Livy, xxi. 62, xxv. 7, etc.). In addition to all those already mentioned, there occasionally occurred ludi votivi, which were celebrated in fulfilment of a vow; ludi funebres, sometimes given by private persons; and ludi seculares, to celebrate certain periods marked off in the Etrusco-Roman religion.

Feasts of the Jews.—By Old Testament writers a festival or feast is generally called either חַג (compare the Arabic Hadj), from חָגַג, to rejoice or מוֹעֵד, from יָעַד, to appoint. The words שַׁבָּת and מִקְרָא קֹדֶשׁ are also occasionally used. In the Talmud the three principal feasts are called רְגָלִים, after Exod. xxiii. 14. Of the Jewish feasts which are usually traced to a pre-Mosaic origin the most important and characteristic was the weekly Sabbath, but special importance was also attached from a very early date to the lunar periods. It is probable that other festivals also, of a seasonal character, were observed (see Exod. v. 1). In common with most others, the Mosaic system of annual feasts groups itself readily around the vernal and autumnal equinoxes. In Lev. xxiii., where the list is most fully given, they seem to be arranged with a conscious reference to the sacred number seven (compare Numb. xxviii.). Those belonging to the vernal equinox are three in number; a preparatory day, that of the Passover, leads up to the principal festival, that of unleavened bread, which again is followed by an after-feast, that of Pentecost (see PASSOVER, PENTECOST). Those of the autumnal equinox are four; a preparatory day on the new moon of the seventh month (the Feast of Trumpets) is followed by a great day of rest, the day of Atonement (which, however, was hardly a *festival* in the stricter sense of the word), by the feast of Tabernacles, and by a great concluding day (Lev. xxiii. 36; John vii. 37). If the feast of the Passover be excepted, it will be seen that all these celebrations or commemorations associate themselves more readily with natural than with historical events.[3] There was also a considerable number of post-Mosaic festivals, of which the principal were that of the Dedication (described in 1 Macc. iv. 52–59; comp. John x. 22) and that of Purim, the origin of which is given in the book of Esther (ix. 20 *sq.*). It has probably no connection with the Persian festival Furdegán (see ESTHER)[4].

Earlier Christian Festivals.—While making it abundantly manifest that Christ and His disciples observed the appointed Jewish feasts, the New Testament nowhere records the formal institution of any distinctively Christian festival. But we have unambiguous evidence of the actual observance, from a very early period, of the first day of the week as a holy day (John xx. 19, 26; 1 Cor. xvi. 2; Acts xx. 7; Rev. i. 10). Pliny in his letter to Trajan describes the Christians of Bithynia as meeting for religious purposes on a set day; that this day was Sunday is put beyond all reasonable doubt by such a passage as that in the *Apology* of Justin Martyr, where he says that "on Sunday (τῇ τοῦ ἡλίου λεγομένῃ ἡμέρᾳ) all the Christians living either in the city or the country met together." The Jewish element, in some churches at least, and especially in the East, was strong enough to secure that, along with the *dies dominica*, the seventh day should continue to be kept holy. Thus in the *Apostolic Constitutions* (ii. 59) we find the Saturday specially mentioned along with the Sunday as a day for the assembling of the church; in v. 15 it is ordained that there shall be no fasting on Saturday, while in viii. 33 it is added that both on Saturday and Sunday slaves are to have rest from their labors. The 16th canon of the council of Laodicea almost certainly means that solemn public service was to be held on Saturday as well as on Sunday. In other quarters, however, the tendency to regard both days as equally sacred met with considerable resistance. The 36th canon of the council of Illiberis, for example, deciding that Saturday should be observed as a fast-day, was doubtless intended to enforce the distinction between Saturday and Sunday. At Milan in Ambrose's time Saturday was observed as a festival; but Pope Innocent is found writing to the bishop of Eugubium to urge that it should be kept as a fast. Ultimately the Christian church came to recognize but one weekly festival.

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[1] See Schoemann, *Griechische Alterthümer*, ii. 439 sq.; Mommsen, *Heortologie*.

[2] Feriæ privatæ, such as anniversaries of births, deaths, and the like, were observed by separate clans, families, or individuals.

[3] In the "parallel" passages, there is considerable variety in the designation and arrangement of these feasts. While Ex. xii. approximates most closely to Lev. xxiii. and Num. xxviii., Ex. xxiii. has stronger affinities with Deut. xvi. The relations of these passages are largely discussed by Graf, *Die Geschichtlichen Bücher des A. T.*, pp. 34–41, and by other recent critics.

[4] On the whole subject of Jewish festivals see Reland, *Antiq. Hebr.*; Knobel, *Leviticus* (c. 23); George, *Die Jüdischen Feste*; Hupfeld, *De primitiva fest. ap. Hebr. ratione*; Ewald, *Alterthümer des Volkes Israel*; Dillmann in Schenkel's *Bibel-lexicon*, art. "Feste."

The numerous yearly festivals of the later Christian church, when historically investigated, can be traced to very small beginnings. Indeed, while it appears to be tolerably certain that Jewish Christians for the most part retained all the festivals which had been instituted under the old dispensation, it is not at all probable that either they or their Gentile brethren recognized any yearly feasts as of distinctively Christian origin or obligation. It cannot be doubted, however, that gradually, in the course of the 2d century, the universal church came to observe the anniversaries of the death and resurrection of Christ—the *πάσχα σταυρώσιμον* and the *πάσχα ἀναστάσιμον*, as they were respectively called (see EASTER and GOOD FRIDAY). Not long afterwards Whitsunday also came to be fixed in the usage of Christendom as a great annual festival. Even Origen (in the 8th book *Against Celsus*) enumerates as Christian festivals the Sunday, the *παρασκευή*, the Passover with the feast of the Resurrection, and Pentecost; under which latter term, however, he includes the whole period between Easter and Whitsuntide. About Cyprian's time we find individual Christians commemorating their departed friends, and whole churches commemorating their martyrs; in particular, there are traces of a local and partial observance of the feast of the Innocents. Christmas day and Epiphany were among the later introductions, the feast of the Epiphany being somewhat the earlier of the two. Both are alluded to indeed by Clemens Alexandrinus (i. 340), but only in a way which indicates that even in his time the precise date of Christ's birth was unknown, that its anniversary was not usually observed, and that the day of his baptism was kept as a festival only by the followers of Basilides (see EPIPHANY).

When we come down to the 4th century we find that, among the 50 days between Easter and Pentecost, Ascension day has come into new prominence. Augustine, for example, enumerates as anniversaries celebrated by the whole church those of Christ's passion, resurrection, and ascension, along with that of the outpouring of the Holy Ghost, while he is silent with regard to Christmas and Epiphany. The general tendency of this and the following centuries was largely to increase the festivals of the church, and by legislation to make them more fixed and uniform. Many passages, indeed, could be quoted from Chrysostom, Jerome, and Augustine to show that these fathers had not by any means forgotten that comparative freedom with regard to outward observances was one of the distinctive excellences of Christianity as contrasted with Judaism and the various heathen systems (compare Socrates, *H. E.*, v. 22). But there were many special circumstances which seemed to the leaders of the Church at that time to necessitate the permission and even legislative sanction of a large number of new feasts. The innovations of heretics sometimes seemed to call for rectification by the institution of more orthodox observances; in other instances the propensity of rude and uneducated converts from paganism to cling to the festal rites of their forefathers proved to be invincible, so that it was seen to be necessary to seek to adapt the old usages to the new worship rather than to abolish them altogether;[1] moreover, although the empire had become Christian, it was manifestly expedient that the old holidays should be recognized as much as possible in the new arrangements of the calendar. Constantine soon after his conversion enacted that on the *dies dominica* there should be no suits or trials in law; Theodosius the Great added a prohibition of all public shows on that day, and Theodosius the younger extended the prohibition to Epiphany and the anniversaries of martyrdoms, which at that time included the festivals of St. Stephen, and of St. Peter and St. Paul, as also that of the Maccabees. In the 21st canon of the council of Agde (506), besides Easter, Christmas, Epiphany, Ascension, and Pentecost, we find the Nativity of John the Baptist already mentioned as one of the more important festivals on which attendance at church was regarded as obligatory. To these were added, in the centuries immediately following, the feasts of the Annunciation, the Purification, and the Assumption of the Virgin; as well as those of the Circumcision, of St. Michael, and of All Saints.

Festivals were in practice distinguished from ordinary days in the following ways:—all public and judicial business was suspended,[2] as well as every kind of game or amusement which might interfere with devotion; the churches were specially decorated; Christians were expected to attend public worship, attired in their best dress; love feasts were celebrated, and the rich were accustomed to show special kindness to the poor; fasting was strictly forbidden, and public prayers were said in a standing posture.

Later Practice.—In the present calendar of the Roman Catholic Church the number of feast days is very large. Each is celebrated by an appropriate office, which, according to its character, is either duplex, semi-duplex, or simplex. A duplex again may be either of the first class or of the second, or a major or a minor. The distinctions of ritual for each of these are given with great minuteness in the general rubrics of the breviary; they turn chiefly on the number of Psalms to be sung and of lessons to be read, on the manner in which the antiphons are to be given, and on similar details. The duplicia of the first class are the Nativity, the Epiphany, Easter with the three preceding and two following days, the Ascension, Whitsunday and the two following days, Corpus Christi, the Nativity of John Baptist, Saints Peter and Paul, the Assumption of the Virgin, All Saints, and, for each church, the feast proper to its patron or title and the feast of its dedication. The duplicia of the second class are the Circumcision, the feast of the Holy Name of Jesus, of the Holy Trinity, and of the Most Precious Blood of Christ, the feasts of the Purification, Annunciation, Visitation, Nativity, and Conception of the Virgin, the Natalitia of the Twelve Apostles, the feasts of the Evangelists, of St. Stephen, of the Holy Innocents, of St. Joseph and of the Patrocinium of Joseph, of St. Lawrence, of the Invention of the Cross, and of the Dedication of St. Michael. The Dominicæ majores of the first class are the first Sunday in Advent, the first in Lent, Passion Sunday, Palm Sunday, Easter Sunday, Dominica in Albis, Whitsunday, and Trinity Sunday; the Dominicæ majores of the second class are the second, third, and fourth in Advent, Septuagesima, Sexagesima, and Quinquagesima Sundays, and the second, third, and fourth Sundays in Lent.

In the canons and decrees of the council of Trent repeated allusions are made to the feast days, and their fitness, when properly observed, to promote piety. Those entrusted with the cure of souls are urged to see that the feasts of the church be devoutly and religiously observed, the faithful are enjoined to attend public worship on Sundays and on the greater festivals at least, and parish priests are bidden to expound to the people on such days some of the things which have been read in the office for the day. Since the council of Trent, the practice of the church with respect to the prohibition of servile work on holidays has varied considerably in different Catholic countries, and even in the same country at different times. Thus in 1577, in the diocese of Lyons, there were almost 40 annual festivals of a compulsory character. By the concordat of 1802 the number of such festivals was for France reduced to four, namely, Christmas day, Ascension day, the Assumption of the Virgin, and All Saints' day.

The calendar of the Greek Church is even fuller than that of the Latin, especially as regards the *ἑορταὶ τῶν ἁγιῶν*. Thus on the last Sunday in Advent the feast of All Saints of the Old Covenant is celebrated; while Adam and Eve, Job, Elijah, Isaiah, etc., have separate days. The distinctions of ritual are analogous to those in the Western Church. In the Coptic Church there are seven great festivals, Christmas, Epiphany, the Annunciation, Palm Sunday, Easter Sunday, Ascension, and Whitsunday, on all of which the Copts "wear new clothes (or the best they have), feast, and give alms" (Lane). They also observe, as minor festivals, Maundy Thursday, Holy Saturday, the feast of the Apostles (11th July), and that of the Discovery of the Cross.

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[1] As, at a later period (601), Gregory the Great instructed his Anglo-Saxon missionaries so to Christianize the temples, festivals, etc., of the heathen "ut duræ mentes gradibus vel passibus, non autem saltibus, eleventur."

[2] Manumission, however, was lawful on any day.

In common with most of the churches of the Reformation, the Church of England retained a certain number of feasts besides all Sundays in the year. They are, besides Monday and Tuesday both in Easter-week and Whitsun-week, as follows:—the Circumcision, the Epiphany, the Conversion of St. Paul, the Purification of the Blessed Virgin, St. Matthias the Apostle, the Annunciation of the Blessed Virgin, St. Mark the Evangelist, St. Philip and St. James (Apostles), the Ascension, St. Barnabas, the Nativity of St. John Baptist, St. Peter the Apostle, St. James the Apostle, St. Bartholomew, St. Matthew, St. Michael and all Angels, St. Luke the Evangelist, St. Simon and St. Jude, All Saints, St. Andrew, St. Thomas, Christmas, St. Stephen, St. John the Evangelist, the Holy Innocents. The 13th canon enjoins that all manner of persons within the Church of England shall from henceforth celebrate and keep the Lord's day, commonly called Sunday, and other holy days, according to God's holy will and pleasure, and the orders of the Church of England prescribed in that behalf, that is, in hearing the Word of God read and taught, in private and public prayers, in acknowledging their offences to God and amendment of the same, in reconciling themselves charitably to their neighbors where displeasure hath been, in oftentimes receiving the communion of the body and blood of Christ, in visiting of the poor and sick, using all godly and sober conversation. (Compare Hooker, *E. P.*, v. 70). In the *Directory for the Public Worship of God* which was drawn up by the Westminster Assembly, and accepted by the Church of Scotland in 1645, there is an appendix which declares that there is no day commanded in Scripture to be kept holy under the gospel but the Lord's day, which is the Christian Sabbath; festival days, vulgarly called holydays, having no warrant in the Word of God, are not to be continued; nevertheless it is lawful and necessary, upon special emergent occasions, to separate a day or days for public fasting or thanksgiving, as the several eminent and extraordinary dispensations of God's providence shall administer cause and opportunity to his people.

Several attempts have been made at various times in western Europe to reorganize the festival system on some other scheme than the Christian. Thus at the time of the French Revolution, during the period of Robespierre's ascendency, it was proposed to substitute a tenth day (Décadi) for the weekly rest, and to introduce the following new festivals:—that of the Supreme Being and of Nature, of the Human Race, of the French People, of the Benefactors of Mankind, of Freedom and Equality, of the Martyrs of Freedom, of the Republic, of the Freedom of the World, of Patriotism, of Hatred of Tyrants and Traitors, of Truth, of Justice, of Modesty, of Fame and Immortality, of Friendship, of Temperance, of Heroism, of Fidelity, of Unselfishness, of Stoicism, of Love, of Conjugal Fidelity, of Filial Affection, of Childhood, of Youth, of Manhood, of Old Age, of Misfortune, of Agriculture, of Industry, of our Forefathers, of Posterity and Felicity. The proposal, however, was never fully carried out, and soon fell into oblivion.

Mahometan Festivals.—These are chiefly two—the 'Eed es-Sagheer (or minor festival) and the 'Eed el-Kebeer (or great festival), sometimes called 'Eed el-Kurban. The former, which lasts for three days, immediately follows the month Ramadan, and is generally the more joyful of the two; the latter begins on the tenth of Zu-l-Heggeh (the last month of the Mahometan year), and lasts for three or four days. Besides these festivals they usually keep holy the first ten days of Moharram (the first month of the year), especially the tenth day, called Yom Ashoora; the birthday of the prophet, on the twelfth day of the third month; the birthday of El-Hoseyn, in the fourth month; the anniversary of the prophet's miraculous ascension into heaven, in the seventh month; and one or two other anniversaries (see vol. vii. p. 630). Friday, called the day of El-Gumah (the assembly), is a day of public worship; but it is not usual to abstain from public business on that day except during the time of prayer.

Hindu and Buddhist Festivals.—In modern India the leading popular festivals are the Holí, which is held in March or April and lasts for five days, and the Dasahara, which occurs in October (see Hunter's *Statistical Account of Bengal*). Although in its origin Buddhism was a deliberate reaction against all ceremonial, it does not now refuse to observe festivals. By Buddhists in China, for example, three days in the year are especially observed in honor of the Buddha,—the eighth day of the second month, when he left his home; the eighth day of the fourth month, the anniversary of his birthday; and the eighth of the twelfth, when he attained to perfection and entered Nirvāna. In Siam the eighth and fifteenth days of every month are considered holy, and are observed as days for rest and worship. At Trut, the festival of the close of the year, visiting and playgoing are universal. The new year (January) is celebrated for three days; in February is another holiday; in April is a sort of Lent, ushering in the rainy season; on the last day of June presents are made of cakes of the new rice; in August is the festival of the angel of the river, "whose forgiveness is then asked for every act by which the waters of the Meinam have been rendered impure." See Bowring's *Siam* and Carné's *Travels in Indo-China and the Chinese Empire*. Copious details of the elaborate festival-system of the Chinese may be found in Doolittle's *Social Life of the Chinese*. (J. S. BL.)

FESTUS, Sextus Pompeius, a Latin grammarian of uncertain date, but who probably flourished in the 2d century of the Christian era. He wrote an epitome of the celebrated work *De Verborum Significatione*. This was a valuable treatise on many obscure points of grammar, mythology, and antiquities, written by M. Verrius Flaccus, a grammarian who flourished in the reign of Augustus. The abridgment of Festus has been done rather mechanically, and without sufficient discrimination. He has also made a few alterations, and inserted some critical remarks of his own, besides omitting altogether such ancient Latin words as had long been obsolete. These he discussed in a separate work now lost, entitled *Priscorum Verborum Libri cum Exemplis*. Of Flaccus's work, only a few fragments have come down to us, and of Festus's epitome only one original copy is known to be in existence, and that in a very imperfect form. After passing through very many vicissitudes, it found a temporary shelter in the Farnese library at Parma, whence in 1736 it was taken to Naples. At the close of the 8th century Paulus, commonly called Diaconus, who happened to possess a copy of Festus's work, epitomized it; but, being an imperfect scholar, he allowed countless errors to creep into his abridgment, although he abstained from making any additions of his own. From this work of his, and the solitary mutilated copy of the original which still survives, some of the most distinguished scholars of modern Europe have attempted to reconstruct the important treatise of Festus. Of the early editions the best is that of Scaliger, published in 1565, and with supplements by Fulvius Orsinus in 1581. By both these editors many of the blanks are filled up by conjecture. But by far the best of existing editions is that of K. O. Müller, Leipsic, 1839. Festus gives not only the meaning of every word in his treatise, but also its etymology; and his work, fragmentary as it is, has thrown considerable light on the language, mythology, and antiquities of ancient Rome.

FETICHISM is a stage of worship, or of the ways of regarding nature (for in simple states of mind religion and philosophy are in great part merged) in which ordinary material objects are regarded as holding, or as being the vehicle of, supernatural powers and influences,—which powers and influences can, it is supposed, be controlled or directed by the person possessing the object so endowed.

Religions have not, as yet, been scientifically classified in anything like a final manner. Even the most rigorous of minds would hardly assert that the time has yet arrived for such a classification. But it is possible, even now, to collect roughly those beliefs which, whether still existing among savages and uneducated people of all classes or traceable only among the records of the past, bear a general resemblance to each other, and to give a general name marking that resemblance. Such a name we have in "fetichism." The word *feitiço*, corresponding to our "fetich," seems to have been first applied by Portuguese traders on the west coast of Africa to savage objects of worship, which were noticed from their resemblance to the talismans and charms common in Europe, and popular with sailors and travellers above all men.

In Purchas's *Pilgrimage* (1614) is a chapter translated from a Dutch author relating to the customs and rites of the negroes of Guinea, in which *fetissos* and *fetisseros*, or priests, are frequently mentioned. "When the king will sacrifice to *fetisso*, he commands the *fetissero* to inquire of a tree whereto he ascribeth Divinity, what he will demand;" and so the author goes on to describe the manner of questioning this remarkable tree. The word fetich was, however, first used in a general sense by a thoughtful scholar of the 18th century, the president Charles de Brosses, who, in his work *Du Culte des Dieux Fétiches*, strung a number of facts relating to savages on a theory tracing fetichism in Egyptian and classic mythology and in modern life. Comte, the French philosopher, gave great currency to the term by employing it to characterize what he regarded as a great and necessary stage in the theological development of humanity,—a state "plus ou moins prononcé, mais ordinairement tres durable, de pur fétichism, constamment characterisé par l'essor libre et direct de tendance primitive à concevoir tous les corps exterieurs quelconques, naturels ou artificiels; comme animés d'une vie essentiellement analogue à la nôtre, avec des simples differences mutuelles d'intensité" (*Philosophie Positive*, v. 30). In England, and at present among anthropologists generally, the word bears a far more restricted meaning than the one here given to it by Comte. It is applied, not to a belief ascribing volition and will to all objects, to all matter, but to a belief in the peculiar power of certain objects, which power may be discovered and tested by experiment, any success, of course, confirming the hypothesis and giving reputation to the chance-chosen object as a great and potent fetich. Sir J. Lubbock defines fetchism "as that stage of religious thought in which man supposes he can force the deities to comply with his desires." He regards it as the next stage above pure atheism in the religious progress which passes from it, through totemism and shamanism, into idolatry (*Origin of Civilization*, 199). Tylor defines it as "the doctrine of spirits embodied in, or attached to, or conveying influence through, certain material objects."

Both natural and artificial objects are used as fetiches. To the savage nothing seems too great to serve his individual purposes, nothing too insignificant or commonplace to be the centre of his ideas of power and devotion.

Generally upon beginning an expedition the negro of Guinea chooses the first object that presents itself to his eyes upon issuing forth, and vows to worship that as a god if the work in hand prove successful; if not, it is cast aside as useless or worse. Stones, trees, twigs, pieces of bark, roots, corn, claws of birds, teeth, skins, feathers, human and animal remains of all kinds—anything that may strike the savage as in any way peculiar—are used in this manner; even whole species of animals, rivers, the sea, the moon, and the sun. Articles of costume, tools, weapons, boats, and other articles of human manufacture are not objected to.

Museums of such of these things as may have accompanied success in any expedition are kept, and are regarded as sacred places, not to be entered without reverence. Other such objects are the property of private individuals, household gods, and are consulted upon all occasions of importance. If the wishes of the worshipper be not granted, all a savage's rather powerful vocabulary of abuse is exhausted upon the fetich. It is kicked, stamped upon, dragged through the mud. Change of luck, however, produces apologies, and promises of future regard and worship. Savages who have taken trees as their fetiches, if they are unlucky cut down trees in revenge. The actions seem rather to be tentatives for the discovery of hidden power than those of any formulated and dogmatic cultus.

In considering the state of mind which all this kind of action implies, we must remember that not only human beings, not only animate beings, are regarded by savages as possessing spirits, but that they attribute spirits to inanimate objects also. The sight of the figures of departed friends and ancestors in dreams gives notice of a world of spirits, but each appearing "in his habit as he lived" seems to imply that garments, weapons, and other objects of human social environment must have spirits also. When a chief dies wives and slaves are slain, weapons broken, garments rent to pieces,—for what reason, but that the warrior should not go naked and alone to the world of spirits? As a deadly blow sets free the spirits of animate, so fracture and destruction set free the spirits of inanimate objects.

But the belief in the efficacy of peculiar objects upon a person's welfare is not by any means confined to savages. Witchcraft is a form of fetichism, and it can hardly be said to be dead from among us even now. Others than children may be found who will keep a crooked sixpence, a curious stone, a hard potato, for luck,—prompted by exactly those instincts, which, although long superseded in some races, are perhaps the highest the savage possesses. The power of the fetich seems in many cases, however, to be regarded not as superhuman, but as extra-human. The tendency to believe that what precedes, accompanies, or follows a thing or accident must be somehow causally connected with it is ever prevalent; and to palliate our wonder at the gross superstitions of the savage we must remember how many people we have met in the heart of modern civilization who are careful about lucky and unlucky days and numbers. As the fetich becomes more and more endowed with personality and will, so the belief passes imperceptibly into what is called idolatry.

See Brosses, *Du Culte des Dieux Fétiches*, 1760; Dulaure, *Hist. des differens cultes*, 1828; Lubbock, *Origin of Civilization;* Tylor, *Primitive Culture;* Schultze, *Der Fetischismus*. (W. HE.)

FÉTIS, **François Joseph** (1784–1871), although a fertile composer of almost every kind of music, will be chiefly remembered as a theoretical and critical writer. He was born at Mons in Belgium, March 25, 1784, and was trained as a musician by his father, who followed the same calling. In 1800 he went to Paris and completed his studies at the Conservatoire under such masters as Boieldieu, Rey, and Pradher. After many vicissitudes he was in 1823 appointed professor at the same celebrated institute, and remained in the French capital for ten years, till in 1833 he obtained the directorship of the music-school of Brussels, which owes much to his indefatigable zeal. He also was the founder, and, till his death, the conductor of the celebrated concerts attached to the conservatoire of Brussels. In this important position he exercised a potent influence on musical education and musical taste in Belgium. He also furnished a large quantity of original compositions, from the opera and the oratorio down to the simple chanson. But all these are doomed to oblivion. Although not without traces of scholarship and technical ability, they show total absence of genius. More important are his writings on music. They are partly historical, such as the *Curiosités historiques de la musique*, Paris, 1850, and the unfinished *Histoire universelle de musique*, of which only the first three volumes have appeared (Paris, 1869–1872), partly theoretical. Amongst the latter the *Méthode des méthodes de piano* (Paris, 1837), written in conjunction with Moscheles, may be named. By far the most important of his works is the celebrated *Biographie Universelle des Musiciens*, commenced as early as 1806, but not published till 1834 (in 8 vols.). Although full of mistakes, and marked by narrowness and onesidedness of critical judgment, it is a work of vast and varied information, and as such still unsurpassed. Fétis died at Brussels in 1871. His valuable library was purchased by the Belgian Government and presented to the conservatoire.

FEU, in the law of Scotland, signifies, in its widest sense, any tenure of land by which the relation of superior (or overlord) and vassal is constituted. Of these tenures the feudal system in Scotland has recognized five,—ward (the original military tenure, abolished in 1747), feu, blench, mortification, and burgage. The term feu, however, is now in practice restricted to one of these, feu-holding or feu-farm, which is a grant of land, or property connected with land, in perpetuity, on condition of the grantee making to the granter a fixed annual payment of a substantial nature with a liability for certain contingent payments termed casualties—the radical right to the whole remaining with the granter. It is opposed to blench-holding—the only other feudal tenure now made use of in Scotland—in which the payment to the superior is merely nominal in amount, *e. g.*, a penny Scots. The feudal system embraces the whole of Scotland except Orkney and Shetland, where remains of the udal right are still to be found. It is a fundamental principle of the system as developed in Scotland to permit subinfeudation to an unlimited extent,—that is, every vassal, unless restrained by special agreement, may feu the whole or part of his land to another person, who thereby becomes his sub-vassal; and by the Act of 1874 conditions by superiors prohibiting subinfeudation cannot thereafter be lawfully made. The feu-duty is usually a payment either in money or in kind, Services, however, are still legal if they are not of a military nature; but they must be paid within the year, as is also the case with blench duties of whatever sort. The casualties now recognized are —relief, the fine payable by an heir on succeeding; composition, that payable by a stranger; and life-rent escheat, the forfeiture to the superior of the annual profits of the land while the vassal is civilly dead for failing to answer for a crime. The vassal, also, if he is two years in arrears in payment of the feu-duty and allows decree of irritancy, as it is called, to pass against him, loses his right absolutely. Casualties were at one time more numerous and more irksome in their incidence than at present, for the law now regards with disfavor all feudal payments not of a fixed periodical nature. Indeed, it may be said that casualties no longer exist, for the Conveyancing (Scotland) Act of 1874 has abolished all payments of a contingent nature in new feus, and provides for the commutation of those already existing. This Act, while it has preserved the name, has really destroyed the relation of superior and vassal, as that has been long understood in Scotland. A feu is the usual title upon which land is granted for building purposes in Scotland. Long building-leases are not much known; and this has greatly contributed to the durable nature and value of Scotch house property.

FEUCHTERSLEBEN, EDUARD, FREIHERR VON (1806–1849), an Austrian physician, philosopher, and poet, was born at Vienna on the 29th April, 1806. He entered the university of Vienna in 1825, and obtained his doctor's degree in 1833. In 1845 he became dean of the faculty of medicine, and in 1847 was named vice-director of medico-chirurgical studies. In July, 1848, he was appointed under-secretary of state of the education department, but resigned his office in the same year, and died 3d September, 1849.

His principal prose writings are *Ueber das Hippokratische erste Buch von der Diätetik*, Vienna, 1835; *Ueber die Gewissheit und Würde der Heilkunst*, Vienna, 1835; *Lehrbuch der ärztlichen Seelenkunde*, Vienna, 1835, translated into English under the title *Medical Physiology;* and *Zur Diätetik der Seele*, Vienna, 1838. He obtained some reputation also as a poet. Some of his verses are lyrical, but most are of a didactic character. His collected works—with the exception of those purely medical—edited by the poet Hebbel, were published in 7 vols. at Vienna, 1851–53.

FEUDALISM, FEUDAL SYSTEM. *Feodum*, *feudum*, fief, or fee is derived from the German *Vieh*, cattle (Gothic, *faihu;* Old High German, *fihu;* Old Saxon, *fehu;* Anglo-Saxon, *feoh*); in a secondary sense the word came to denote goods, money, property in general. The second syllable has been connected with another root, *od*, also meaning property,—the whole word denoting property held as a reward, or in consideration of special service. Whether this etymology be correct or not, this is the signification which the word acquired in time. "The word *feodum* is not found earlier than the close of the 9th century. But neither the etymology of the word nor the development of its several meanings can be regarded as certain."[1]

Feudalism in a broad sense may be taken to mean a social organization based on the ownership of land, and personal relations created by the ownership of land,—a state of things in which public relations are dependent on private relations, where political rights depend on landed rights, and the land is concentrated in the hands of a few. Feudalism in this sense has existed, and perhaps may still exist, in various parts of the world; but the feudal system *par excellence* is always understood to mean that special form of feudalism which was developed on the soil of Gaul by the conquering Franks. England had a feudalism of its own, developed simultaneously but independently through the operation of similar causes. Just as the insular feudalism had reached its maturity, the continental feudalism was brought over ready-made by the Normans, and superimposed on the basis of the domestic product. Thus our social state exhibits elements derived from both forms of feudalism, in conjunction with fossil relics of still earlier institutions. Both varieties of feudalism may be regarded as transition states, intervening between the rough wild liberty of primitive society based on individualism and the carefully organized liberty of modern society based on the effectual supremacy of the law.

Both forms of feudalism had their roots in the organization of primitive Germany. A glance at that system is desirable for a thorough comprehension of our subject; it will help us to realize what feudalism was, if not to discern how it grew up. The leading characteristics of the Teutonic polity were individual liberty and tribal autonomy. Each tribe or canton is theoretically independent and entitled to manage its own concerns; within the tribe all free heads of houses are politically equal, and entitled to a voice in the affairs of the community. Each free villager has his share of the tribe lands,—his homestead, his proportion of the arable land, with corresponding rights over the forest and pasture-lands. The shares are not necessarily equal, as social distinctions exist, and are fully recognized by the law; but whether large or small, the shares are held on the like terms of participation in all public duties, chief of which are the obligations of attendance in the communal meetings and in the host. The shares so held "bore among the northern nations the name of Odal or Edhel."[2] Whether any etymological connection exists between the words *odal* and *alod* "may be questioned, but their signification as applied to land is the same: the alod is the hereditary estate derived from primitive occupation, for which the owner owes no service except the personal obligation to appear in the host and in the council."[3] As above intimated, political equality was not held incompatible with social inequality; the population was divided into three classes, rated at different values in the legal tariff. First came the *nobilis*, *eorl*, or *ætheling*, the man distinguished by ancestral wealth and reputed purity of blood; next ranked the simple freeman, the *ingenuus*, *frilingus*, or *ceorl;* at the bottom of the social scale stood the serf or slave (*colonus lazzus*, *læt*, *servus*, *theow*). An injury done to an *eorl* or his property would cost the offender twice or three times as much as the same injury done to a *ceorl;* at an equal distance below the *ceorl* ranks the slave, but the compensation for injury done to him of course goes to his master. The official magistracy (*principes*) are selected from the ranks of the nobility; very distinguished parentage will at times entitle a mere lad to high office, but this is rare.[4] Superior birth gives weight and precedence in the national councils; above all, where a powerful tribe or confederation of tribes think fit to exalt their dignity by conferring regal honors on their chief, care is taken to select the king from the family of noblest birth. But in critical times the instinct of a free people taught that the claims of birth must give place to more weighty considerations; whoever might be allowed to rule in time of peace, on the field of battle only the man of tried ability could take the lead.[5] Judicial and political business was transacted in the various national assemblies held at fixed times, "generally at the new or full moon." Local questions and matters of police were determined in the meetings of the mark or township (*vicus*, *dorf*); the higher criminal jurisdiction and questions of a political nature were reserved for the *malls* or *gemotes* of the hundred, canton, or tribe (*gau*, *pagus*, *gens*); "there was no distinction of place; all were free, all appeared in arms." The order of business was settled beforehand by the chiefs in committee, a leading elder would open the debate; others followed as the spirit moved them; the people decided as they thought fit. "Opposition was expressed by loud shouts, assent by the striking of spears, enthusiastic applause by the clash of spear and shield."[6]

The analogy of popular meetings in other ages and countries will warrant the belief that under ordinary circumstances the people would be greatly swayed by the policy of their leaders, but the fact remains that the ultimate appeal was to the people. So with the local judicial meetings: the position of the elected *princeps* is "rather that of president than of judge;" all the free men sit as his assessors. "Doubtless they both declared the law and weighed the evidence." The authority of the *princeps* was in all cases limited: "De minoribus rebus principes consultant; de majoribus omnes."[1] Even the prerogatives of the monarchical chiefs were subject to strict limitations. Their position was one of high honor but not of irresponsible power. The practical influence of the chief, whether exalted to royal dignity or not, depended largely upon the strength of his *comitatus*, or household retinue. This institution, "one of the strangest but most lasting features" of early Aryan civilization, was an arrangement "partly private and partly public in its character," which served to furnish "a sort of supplement to an otherwise imperfect organization."[2] The *comitatus* was a voluntary bond of partial vassalage, intended for mutual protection and support, by which a freeman, even a man of noble birth, attached himself to a more powerful lord (*hlaford*,[3] *princeps*). At the table of his lord the free companion, as he was called (*comes*, gesith), found a comfortable seat; from his lord he received his equipment for war or the chase (*heregeatwe*, heriot), which reverted to the lord at his death. In return he was bound to espouse the cause of his lord as against all men and by all means. The position of a favored gesith was one of comfort and social importance; but involving, as it did, the surrender of all freedom of individual action, it probably entailed a certain diminution of political status.[4] The tie of the comitatus, when coupled with the tenure of land, gives us the germ from which the whole feudal system was developed.[5] It has been commonly held, apparently on the authority of Montesquieu, that the Frankish conquests in Gaul were effected by independent nobles fighting each with a powerful comitatus at his back; that the lands so conquered were immediately parcelled out by them among their *comites* upon terms of military service and special fidelity; and that the Merwing state from the first was built up on the feudal principle of vassalage.[6] The sound view appears to be that—as in Britain, so in Gaul—the Germanic tribes came over as "nations in arms," "with their flocks and their herds, their wives and their little ones;" that they brought their Germanic social and political organization with them; and that the Merwing kingdom was mainly constructed on that basis—subject to modifications introduced perforce by the circumstances of the conquest. In Britain it is clear that the primitive political institutions were introduced *en bloc*, and took root; of the agrarian settlement effected, evidence is lacking during the first centuries of the new order. When trustworthy data begin to appear feudalism has already made large inroads on primitive alodialism. In Gaul the chain of evidence is continuous, and it is beyond doubt that under the first dynasty the tenure of land was still mainly alodial; that all the people were bound to be faithful to the king as a national duty, and not by virtue of special land tenure; that "the gift of an estate by the king involved no defined obligation of service," all the nation being still bound to military service; that "the only comites were the *antrustions*, and these few in number;" and that the supposed larger class of comites, the *leudes*, were in fact the whole body of the king's good subjects, in Anglo-Saxon phrase, his "hold."[7]

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[1] Stubbs, *Constitutional History*, i. 251. "Le mot apparait pour la première fois dans une charte de Charles le Gros, en 884." Up to that date *beneficium* is used apparently to designate the same thing.—Guizot, *Civil. France*, iv. 41. *Cf.* Robertson, *Scotland under her early Kings*, ii. 454.

[2] Also known as *Hube* in Germany; in England and France as *mansus*, *hide*, *cassata*, *terra familiæ*, etc.

[3] Stubbs, *sup.*, 53.

[4] Tacitus, *Germ.*, ch. 13.

[5] Tacitus, *Germ.*, ch. 7. This, however, would hardly apply to the case of a monarchical tribe.

[6] Stubbs, *sup.*, 29; Tacitus, *sup.*, ch. 11–13.

If we pass to the close of the 10th century, and take a survey of the social condition of western Europe, we shall find all the principles of the primitive Germanic society inverted. Political organization from being personal has become territorial; "the ideas of individual freedom and political right" have "become so much bound up with the relations created by the possession of land as to be actually subservient to them."

Everything belongs either to the king or the lord. Thus in England the national peace is now the king's peace; the state domain—the folkland—is *terra regis*. The township has become the lord's manor, the township waste the lord's waste, the township court the lord's court. "Land has become the sacramental tie of all public relations; the poor man depends on the rich, not as his chosen patron, but as the owner of the land that he cultivates, the lord of the court to which he does suit and service, the leader whom he is bound to follow to the host."[8] This dreary result was not accomplished in a day. But the causes began to operate from a very early period. Even if each free immigrant received his due family portion of land, a much larger allotment would certainly be assigned to the leader, who might be considered to have contributed most to the success of the undertaking; whole townships in a dependent position might thus be established from the very first. The leaders of the migration of course came armed with all the exceptional powers usually conferred on *duces* in time of war; the position of the new comers, as military colonists encamped on the lands of others, led to a prolongation of those powers. Strong government was an absolute necessity; consequently royalty, previously unknown to the Anglo-Saxon tribes, makes its appearance as an immediate consequence of the conquest. Five years after his landing the "heretoga" Hengest is raised to kingship. When the resistance of the natives was crushed, political wars and wars of succession between the invaders themselves ensued, each struggle adding to the private possessions and political influence of the victorious chief. "Everything, in fact, which disturbs the peaceful order of the village system tends to the aggrandizement of the leading family and its chief."[9] The new order of things, however, sprang from two great sources, the beneficiary system and the practice of "commendation." "On Gallic soil it was specially fostered by the existence of a subject population, which admitted of any amount of extension in the methods of dependence."[10]

The system of benefices had its origin partly in grants of land made by kings and *principes* to their *comites*, kinsmen, and servants, on terms of special fidelity,—analogous to, if not identical with, the bond of the *comitatus*,—partly in the surrender of alodial estates made by the owners to lay or ecclesiastical potentates, to be received back, and held under them as *beneficia*. By this arrangement the dependant bought the protection of a temporal or spiritual patron. Commendation was a similar arrangement, entered into without reference to land;[11] the weaker man placed himself under the personal protection of a superior "without altering his title or divesting himself of his estate: he became a vassal and did homage. The placing of his hands between those of his lord was the typical act by which the connection was formed. And the oath of fealty was taken at the same time. The union of the beneficiary tie with that of commendation completed the idea of feudal obligation." Both lord and "man" have a hold on the land; each has his duty to the other,—the one to protect, the other to support. "A third ingredient was supplied by the grants of immunity by which the dwellers on a feudal property were placed under the tribunal of the lord, and the rights which had belonged to the nation or its chosen head were devolved upon the receiver of a fief."[12]

The system so formed was of mingled origin. The beneficium "is partly of Roman partly of German origin;" commendation might be traced up to the comitatus or the Roman clientship, or possibly to Celtic usages of kindred ancestry.[13] All these elements, the benefice proper, the surrendered alod, the personal commendation, the private jurisdiction, find their place in English as well as in French history, but the elements were blended in different proportion, and under external conditions of a different character. In England the tie of the comitatus played an important part, and became the basis of the later Anglo-Saxon nobility. On the Continent the comitatus was soon lost in "the general mass of vassalage;"[14] on the Continent territorial influences became paramount; in England personal and legal influences were never extinguished. Both in France and England the process of commendation was fostered by edicts of the central Government, requiring, for purposes of police, that all persons of humble station should place themselves under lords.[1] "The process by which the machinery of government became feudalized, though rapid, was gradual." In 843, the date of the great treaty of Verdun, two princes shared the land of France with Charles the Bold, namely, the king of Aquitaine and the duke of Brittany.[2] In 877 Charles was induced to publish a recognition of the hereditary character of benefices. By the end of the century nine-and-twenty provinces, or parts of provinces, had been erected into petty states; by the year 1000 the list had swelled to fifty-five.[3]

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[1] Tacitus, *sup.*

[2] Stubbs, *sup.*, 25.

[3] Literally "Loaf-giver."—*Kemble.*

[4] Tacitus, *sup.*, 13–14. On the whole subject see Kemble's *Saxons*, i. 168; Stubbs, *sup.*, 24; Freeman's *Norm. Conquest*, i. 92.

[5] "Ainsi chez les Germains il y avoit des vassaux, et non pas des fiefs," Montesq., *Esprit des Lois*, xxx. iii.

[6] See Guizot, *Civilis France*, i. 311, etc. Yet see Montesquieu, *Esprit des Lois*, xxx. v. xi.

[7] See Stubbs, i. 251, citing Waitz, *Deutsche Verfassungsgeschichte*, ii. 251, etc. "The work of Sohm (*Altdeutsche Reichs und Gerichts Verfassung*) completes the overthrow of the old theory, by reconstructing, in a very remarkable manner, the old German system in Salian and Merovingian times." See also Robertson's *Scotland*, ii. 449. For the word "hold," see the proclamation of Henry III. in 1258, *Fœdera*, i. 378.

[8] Stubbs, *sup.*, 167.

[9] Maine, *Village Communities*, 143.

[10] Stubbs, *sup.*, 252.

[11] Stubbs, following Waitz, ii. 262, iv. 210, denies any connection between the commendation and the beneficiary system of the Frank empire with the primitive comitatus. Roth, *Beneficialwesen*, 385, regards commendation as "placing a man in the relation of comitatus to his lord; and he makes the Frank antrustionship a link between the primitive comitatus and later feudalism.

[12] Stubbs, *sup.*, 253.

[13] Waitz, iv. 199.

[14] "In the Frank empire the beneficiary system is unconnected with the comitatus; in the English they are in the closest connection."—Stubbs, 153. In spite of this authority, it seems hard to believe that there was no connection whatever between the Frank benefices and the comitatus.

> "The weakness of the Karoling kings gave room for the speedy development of disruptive tendencies in a territory so extensive and so little consolidated. The duchies and counties of the 8th and 9th centuries were still official magistracies, the holders of which discharged the functions of imperial judges or generals. Such officers were of course men whom the kings could trust, in most cases Franks, courtiers or kinsmen, who at an earlier date would have been *comites* or *antrustions*, and who were provided for by feudal benefices. The official magistracy had in itself the tendency to become hereditary, and when the benefice was recognized as heritable, the provincial governorship became so too. But the provincial governor had many opportunities of improving his position, especially if he could throw himself into the manners and aspirations of the people he ruled. By marriage or inheritance he might accumulate in his family not only the old alodial estates which, especially on German soil, still continued to subsist, but the traditions and local loyalties which were connected with the possession of them.[4] So in a few years the Frank magistrate could unite in his own person the beneficiary endowment, the imperial deputation, and the headship of the nation over which he presided. And then it was only necessary for the central power to be a little weakened, and the independence of duke or count was limited by his homage and fealty alone,—that is, by obligations that depended on conscience alone for fulfilment. It is in Germany that the disruptive tendency most distinctly takes the political form; Saxony and Bavaria assert their national independence under Swabian and Saxon dukes who have identified the interests of their subjects with their own. In France, where the ancient tribal divisions had long been obsolete, and where the existence of the alod involved little or no feeling of loyalty, the process was simpler still; the provincial rulers aimed at practical rather than political sovereignty; the people were too weak to have any aspirations at all; the disruption was due more to the abeyance of central attraction than to any centrifugal force existing in the provinces. But the result was the same; feudal government, a graduated system of jurisdiction based on land tenure, in which every lord judged, taxed, and commanded the class next below him; in which abject slavery formed the lowest, and irresponsible tyranny the highest grade; in which private war, private coinage, private prisons, took the place of the imperial institutions of government."[5]

This was the social system under which William the Conqueror and his barons had been brought up. English indigenous feudalism had reached its height in 1017, when Cnut "dealt" all England into four earldoms—"to himself the West Saxons, to Thorkell the East Anglians, to Eadric the Mercians, and to Eric the Northumbrians."[6] The four jurisdictions are spoken of as co-ordinate. Such a system, with time, might easily have ripened into continental feudalism. But William had no mind to encourage feudalism as a system of government; on the contrary, he took care to introduce that which England never before had enjoyed, a real central administration, and in that aspect he arrested the growth of feudalism in England. As a system of land tenure it was the only arrangement that he could have conceived or understood; and England was already so extensively feudalized in fact that it seemed the merest change of theory to make all subjects tenants, and the king the universal lord and sole alodial owner. The barons were allowed to take up the hereditary jurisdictions already existing on the estates on which they entered; but the administrative functions of the Anglo-Saxon earls were transferred to the king's sheriffs. The barons resisted, but William's strong arm kept them down; again and again under his two sons the struggle was renewed. "The English, who might never have struggled against native lords, were roused by the fact that their lords were strangers as well as oppressors, and the Norman kings realized the certainty that if they would retain the land they must make common cause with the people."[7] Under Stephen feudalism burst out in all its horrors; fortunately the conflagration burnt itself out. The English rallied again round Henry II.; the great houses of the Conquest successively "suffered forfeiture or extinction;" the other Normans became Englishmen; and the legal and constitutional reforms of Henry II., with the help of the nation, "put an end to the evil."[8]

In France the royal authority had been reduced to a shadow. But

> "the shadow is still the centre round which the complex system, in spite of itself, revolves. It is recognized by that system as its solitary safeguard against disruption, and its witness of national identity; it survives for ages, notwithstanding the attenuation of its vitality, by its incapacity for mischief. In course of time the system itself loses its original energy, and the central force gradually gathers into itself all the members of the nationality in detail, thus concentrating all the powers which in earlier struggles they had won from it, and incorporating in itself those very forces which the feudatories had imposed as limitations on the sovereign power. So its character of feudal suzerainty is exchanged for that of absolute sovereignty. The only checks on the royal power had been the feudatories: the crown has outlived them, absorbed and assimilated their functions; but the increase of power is turned, not to the strengthening of the central force, but to the personal interests of its possessor. Actual despotism becomes systematic tyranny, and its logical result is the explosion which is called revolution. The constitutional history of France is thus the summation of the series of feudal development in a logical sequence which is indeed unparalleled in the history of any great state, but which is thoroughly in harmony with the national character, forming it and formed by it."[9] (J. H. R.)

Remains of Feudalism in English Land Laws.

Feudalism, although it has ceased to exist as a system of political and social relations, still survives as the basis of the law relating to land, both in England and Scotland. The most elementary conceptions of real property carry us back to the relations of lord and vassal, and cannot be understood without reference to them. Ownership of land, in the full sense of the phrase, is unknown to the law of England. There is no such thing as absolute property in land, says the chief English writer on that subject; a man can only have an estate or interest in land. Every landowner, in the popular sense of the phrase, is, in the eye of the law, a tenant only; and such is the case with the largest and most unlimited interest known to the law—that of an estate in fee-simple. The owner in fee is the tenant of some one else, who in his turn is the tenant of another, and so on, until the last and only absolute owner is reached, viz., the king, from whom directly or indirectly all lands are held. The spirit of feudalism has, of course, entirely gone out of the system; only the skeleton is left. Between a tenant in fee-simple and his lord there is no connection whatever except in legal theory; in point of fact, it is for the most part unknown who the lord of a particular tenant may be. There are, however, new contingencies, in which the feudal theory may still yield positive results. Such, for instance, is the case of ESCHEAT (*q. v.*), in which, on the failure of heirs of freeholders dying intestate, the land would go to the next lord, and in the absence of a mesne-lord to the crown. In the case of COPYHOLDS (*q. v.*), the incidents of feudal tenure survive in a more marked degree than in any other class of estates. They sprang from an inferior kind of feudal holding, and remained subject to the custom of the manor to which they belonged. With the exception of such cases, the feudal obligations and restrictions in which the virtue of the system resided have long disappeared. The establishment of the right of alienation, and at a later time of the testamentary disposition, of fee-simple estates, the acquisition by collusive processes of the right of breaking entail, and lastly, the formal abolition in the reign of Charles II. of the most onerous class of feudal obligations—those relating to chivalry—are the most important steps in this process. These tenures in chivalry, by knight-service, or military tenures, as they were variously called, retained the feudal spirit in its most oppressive form. The rights of *wardship* and *marriage* were perhaps the most valuable and the most burdensome of all the rights of the lord. They enabled him to seize the estate of his tenant when he was under age, to exact a fine from him on his coming of age, and to marry him or her to whomsoever he chose. By the 12

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[1] *E. g.*, Athelstan, *Conc. Greatanl.*; Schmid, *Gesetze*, i. 132; Thorpe, i. 200; Baluze, ii. c. 118, cited by Guizot, *Civ. France*, iv. 68.

[2] Guizot, *Civ. France*, ii. 430.

[3] See the tables in Guizot, *sup.*, 433, 437.

[4] "Abundant proof of this position will be found in German history. The rise of the successive families of Saxon dukes and the whole history of Bavaria under the Saxon emperors furnish illustrations. The Saxon dukes of Bavaria carry out the Bavarian policy in opposition to their near kinsmen on the imperial throne. The growth of the Swabian Welfs into perfect identification with the Saxons whom they governed affords another striking instance. In a less degree, but still to some extent, this was the case in France also; but the Gallic populations had lost before the Karoling period most of their national aspirations; nor did the Frank governors identify themselves at any time with the people. Hence the great difference in social results between French and German feudalism."

[5] Stubbs, *sup.*, 255–6.

[6] *Anglo-Saxon Chronicle*, in anno.

[7] Stubbs, *sup.*, 168.

[8] *Ib.*, 257.

[9] *Ib.*, 3–4.

Charles II. c. 24 these tenures, with all their oppressive incidents, were abolished and turned into tenures "in free and common socage," *i. e.*, the ordinary non-military tenure, feudal like the other in its origin, but not subject to the obligations imposed by the military character of the tenure by knight's service. The law of real property is, however, still feudal in the sense that its main lines were laid in the times of feudalism. Its most general terms are all feudal in their original meaning. The fee (feudum) is the feudal estate descendible to a man's heirs. The *freeholder* is the tenant of an estate worthy of a free man, the smallest in quantity being an estate for his own life. To this day a gift to A. B., without other words,[1] means a gift of an estate for life only, because feudal holdings were originally granted to the tenant for his own life, and in return for his own services. And feudal conceptions have overrun and transformed large classes of rights, which in their origin were anterior to feudalism. Thus the independent rights of commoners were ignored, and their privileges were treated as favors granted to them by some lord.

FEUERBACH, Ludwig Andreas (1804–1872), fourth son of the eminent jurist (see next article), was born at Landshut in Bavaria on the 28th of July, 1804. Like other members of his family, he evinced a religious turn of mind from an early age, and he matriculated at the university of Heidelberg with the intention of studying divinity. His ardor, however, was soon diverted to metaphysical pursuits; he repaired to Berlin, became an auditor of Hegel, and, in spite of his father's vehement opposition, devoted himself to the career of a teacher of philosophy. The history of his life henceforward is that of his gradual emancipation from the yoke he had thus imposed upon himself. Even his first work, *Thoughts on Death and Immortality* (1830), exhibits the marked divergence between his mental characteristics and those of the Hegelian school. The conclusion, indeed, is Hegelian, but the author's method is dogmatic rather than dialectical, his cast of thought mystical, his phraseology original, animated with humor and pathos, and strikingly concrete. His negation of personal immortality rendered him obnoxious to the Government, and frustrated his endeavors to obtain a professorship. His embarrassed manner and awkward delivery debarred him from success as a private tutor and lecturer. After some years of disappointment he renounced the attempt to gain a livelihood by philosophy, and married a lady whose scanty dower, derived from a share in a small manufactory, included free apartments in the castle of Bruckberg, and the use of a vegetable garden and shooting in the adjacent woods. In these idyllic circumstances the philosopher supported his family for nearly a quarter of a century,—learning, as he declared, more from his peasant associates than he had learned at the university. "Berlin opened my mouth, Bruckberg my eyes." During his early struggles and the period of his betrothal he had produced his *History of Modern Philosophy*, a series of criticisms of leading thinkers from Bacon to Leibnitz, and his monograph on Pierre Bayle, whom he sets forth as the type of the antithesis between faith and knowledge. His rupture with Hegelianism was first indicated in his *Critique of Hegel* (1839). It was grounded on his growing aversion to mere verbal juggles, and his strengthening conviction that philosophical research must be based upon the investigation of actual phenomena. The enthusiast for metaphysics had ceased to be a metaphysician, and had become the mouthpiece of a reaction the more remarkable from its independence of the contemporaneous development of physical science. The phenomena with which Feuerbach dealt were nevertheless wholly psychological. Those referring to the religious sentiment formed the subject of his next and most celebrated work, *The Essence* (*Wesen*) *of Christianity* (1841). In this famous treatise Feuerbach shows that every article of Christian belief corresponds to some instinct or necessity of man's nature, from which he infers that it is the creation and embodiment of some human wish, hope, or apprehension. The same process of interpretation is applied to natural religion in his essay on that subject (1845), and in his lectures delivered at Heidelberg during the revolutionary troubles of 1848 and 1849. This period of anarchy promised for a moment to bring Feuerbach prominently before the world; the inglorious collapse of the revolution gave an irrecoverable blow to his influence. Notwithstanding his own very reserved attitude, he had become identified in the public mind with the agitators who had made a watchword of his name, and unjustly participated in their discredit. He returned to Bruckberg, and occupied himself partly in scientific research, partly in the composition of his last important work, the *Theogony* (1857). Days of tribulation were now in store for him. Driven from his retreat at Bruckberg by the failure of the manufactory on which he had so long depended, too proud to implore aid, and incapable of writing for mere bread, he would have suffered the extremity of want but for the unsolicited contributions of a few friends, assisted shortly before his death by a public subscription. His intellectual faculties were impaired by successive strokes of paralysis, and he had ceased to take any active interest in human affairs when he expired on September 13, 1872.

Feuerbach is a remarkable figure in the history of modern thought. As a philosopher, he personifies at once the intellectual bankruptcy of mere verbal metaphysics, and the reaction towards empiricism based on the actual observation of nature and society. He reaches substantially the same conclusions as the modern professor of physical science, but by a different path, and independently reproduces the scientific spirit of Positivism, with a total suppression of its sacerdotal element. As a writer on religion his position is ambiguous. Following up the hint of one of the oldest Greek philosophers, he demonstrates that religious ideas have their counterparts in human nature, and assumes that they must be its product. "All theology is anthropology." It does not seem to have struck him that the proposition might equally well be inverted, and might afford scope for a problem as insoluble as that concerning the priority of the owl and the egg. His principal work, however, is rather remarkable for depth and truth of feeling than exactness of reasoning; it wears indeed a semblance of logical consecutiveness, but consists essentially of a series of aphorisms, enunciated dogmatically, somewhat in the manner of Emerson. Ethically, his system has done much good by its lofty views of human nature, and the consecration with which it dignifies the most ordinary passages of human life; and not a little harm by the encouragement which an anthropocentric theory necessarily affords to excessive individual pretensions, and thus indirectly to political and social discontent. Its strongest points are its vigorous grasp of reality, embodiment of ideal aspirations in familiar forms, healthy optimism, and recognition of the value of everything human as such. "Only in action," said Feuerbach, "do we feel ourselves free." "Let us concentrate ourselves on what is real; and great men will revive, and great actions return." "Health is more than immortality." His antagonism to the idea of personal immortality is one of his most distinctive traits, but here as elsewhere he deals with the problem solely from the psychological side. Hence he can neither be classed with materialists nor immaterialists; and, with all his frank honesty and uncompromising energy of language, the same duality of attitude characterizes his position throughout. He is from one point of view irreligious, from another deeply religious, logical and mystical, positive and speculative, academically cultured and a man of the people.

Feuerbach's personal character was highly estimable, fully conformed to the philosophic ideal in simplicity, independence, disinterestedness, and fidelity to conviction. His erudition is extensive and accurate. He possessed no brilliant or superficially attractive qualities; his manner was shy and embarrassed, and his literary composition tardy and laborious. His style, nevertheless, is sufficiently clear and even epigrammatic to make him a popular writer in his own country, but hardly in any other. His chief work, though translated by the first of living English prose writers, produced little impression in England. Out of Germany he will be most esteemed by those who have attained his results by other processes, and most memorable as an instance of the empirical spirit of modern physical science asserting itself in the region of abstract speculation, with little assistance from scientific study.

Feuerbach's *Essence of Christianity* has been translated into the principal European languages; the English version is by George Eliot. His correspondence has been edited, with a confused and imperfect biography, by Karl Grün (Leipsic, 1874). (R. G.)

FEUERBACH, Paul Johann Anselm von (1775–1833), a distinguished writer on criminal law, was born at Jena, November 14, 1775. In his infancy the family removed to Frankfort, and he received his early education at the gymnasium of that town. At the age of seventeen, he went to the university of Jena; and, his path in life not yet being fixed, his active mind eagerly sought after knowledge in all fields. He familiarized himself with the Greek and Roman classics, especially with the poets; and when the common need compelled him to work for bread as well as for knowledge, his choice fell, under the influence of Reinhold's teaching, on divine philosophy. Limiting his worldly wants to the utmost, he devoted himself heart and soul to the research of truth in its higher fields, and at twenty he had already made his mark as a powerful thinker by various philosophical essays. The influence of these early studies is apparent in the great works on which his special reputation rests. But his attention was soon concentrated on the subject to which his life was to be devoted, the science of legislation. He now sat at the feet of Schaubert and Hufeland, and the study of natural law and of jurisprudence excited in him a genuine enthusiasm. The early essays of his student years bore the impress of one of those mighty minds by which beneficent revolutions are wrought, and which open new paths to the race. In 1795 he obtained his degree of doctor in philosophy; and published one of his firstlings, as he calls it, an essay on the only possible arguments against the existence and the value of natural law. The same year he married. In 1796 he published a *Critique of Natural Law* as preparation (*Propädeutik*) for a *Science of Natural Law*. This was followed, in 1798, by his *Anti-Hobbes*, a dissertation on the limits of the civil power, and the right of resistance on the part of subjects against their rulers, and his *Untersuchungen über das Verbrechen des Hochverraths*. In 1799 he obtained his degree of doctor of laws, and received permission to deliver a course of academical lectures. These attracted many hearers, and soon won for him the rank of a master in his science. At the same time appeared an important work, which established his reputation, the *Revision der Grundsätze und Grundbegriffe des peinlichen Rechts*. In this treatise he first set forth his new theory of punishment, the intimidation theory, which was further developed and applied in the *Bibliothek für die peinliche Rechtswissenschaft*, a work produced by Feuerbach in conjunction with Grolman and Von Almendingen, and published in 1800–1801, and was systematically and thoroughly expounded in his famous *Lehrbuch des gemeinen in Deutschland geltenden peinlichen Rechts* (1801), of which the fourteenth edition appeared in 1847. In these works Feuerbach shows himself not only a great thinker and discoverer of truth, but also a gifted teacher and luminous expositor, capable of giving to principles a scientific form, and investing them with the grace and elegance of the highest literary art. His works were a powerful protest against vindictive punishments, and contributed largely to the subsequent humane reformation of criminal laws. Nor was the example of his style without influence on later writers on law. In 1801 Feuerbach was appointed professor at the university of Jena; but many offers were made to him, and in the following year he accepted a chair at Kiel. This he held for two years, lecturing on the law of nature, criminal law, the institutes, the pandects, and hermeneutics. But, disappointed at not finding so numerous, sympathizing, or promising an audience as he had expected, he removed in 1804 to the university of Landshut. He was also named aulic councillor, and was commanded by the king, Maximilian Joseph, to draw up a project of penal law for Bavaria. His position, however, was rendered painful and annoying by the jealousies and dislike of some of his fellow professors, who instigated the students to burlesque and ridicule him, and he resigned his chair. He was then called to Munich with the rank of privy referendary in the department of justice, and in 1808 was created privy councillor. Meanwhile appeared his *Critique on Kleinschrod's project of criminal law* (1804); and the practical reform of penal legislation in Bavaria was begun under his influence in 1806 by the abolition of torture. In 1808 appeared the first volume of his *Merkwürdige Criminalfälle*, completed in 1811—a work of deep interest for its application of psychological considerations to cases of crime, and intended to illustrate the inevitable imperfection of human laws in their application to individuals. In his *Betrachtungen über das Geschworenengericht* (1812) Feuerbach declared against trial by jury, maintaining that the verdict of a jury was not adequate legal proof of a crime. Much controversy was aroused on the subject, and the author's view was subsequently to some extent modified. His labors on the penal law being completed, the project was submitted to rigorous examination, and, receiving ultimately the royal sanction, was promulgated in 1813 as the Bavarian penal code. The influence of this code, the embodiment in logical form of Feuerbach's enlightened and humane views, was immense. It was at once adopted as the model and basis for new codes for Würtemberg and Saxe-Weimar; it was adopted in its entirety in the grand-duchy of Oldenburg; and it was translated into Swedish by order of the king. Several of the Swiss cantons reformed their codes in conformity with it. Feuerbach had also undertaken to prepare a civil code for Bavaria, to be founded on the Code Napoléon. This was afterwards set aside, and the Codex Maximilianus adopted as a basis. But the project did not become law. During the war of liberation (1813–1814) Feuerbach showed himself an ardent patriot, and published several political brochures, which, from the writer's position, had almost the weight of state manifestoes. One of these is entitled *Ueber Deutsche Freiheit und Vertretung Deutscher Völker durch Landstände* (1814). In 1814 Feuerbach was appointed second president of the court of appeal at Bamberg, and three years later he became first president of the court of appeal at Anspach. In 1821 he was deputed by the Government to visit France, Belgium, and the Rhine provinces for the purpose of investigating their juridical institutions; and in 1825 he published, as the fruit of this visit, his treatise *Ueber die Gerichtsverfassung und das gerichtliche Verfahren Frankreichs*. In his later years he took a deep interest in the fate of Kaspar Hauser, which had excited so much attention in Europe; and he was the first to publish a critical summary of the ascertained facts, under the title of *Kaspar Hauser: ein Beispiel eines Verbrechens am Seelenleben* (1832). Shortly before his death appeared a collection of his *Kleine Schriften* (1833). Feuerbach, still in the full enjoyment of his intellectual powers, died suddenly at Frankfort, while on his way to the baths of Schwalbach, May 29, 1833. In 1852 was published the *Leben und Wirken Ans. von Feuerbachs*, 2 vols., consisting of a selection of his letters and journals, with occasional notes by his fourth son Ludwig, the distinguished philosopher (noticed above). (W. L. R. C.)

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[1] Unless in a will, in which case the obvious meaning of the testator will be adopted.

FEUILLETON (a diminutive of *feuillet*, the leaf of a book), a kind of supplement attached to the political portion of the French newspaper. Its inventor was Bertin the elder, editor of the *Débats*. It is not usually printed on a separate sheet, but merely separated from the political part of the newspaper by a line, and printed in smaller type. It consists chiefly of non-political news and gossip, literature and art criticism, a chronicle of the fashions, and epigrams, charades, and other literary trifles; and its general characteristics are lightness, grace, and sparkle. Some editors make use of the feuilleton as a separate sheet to float their journals into popularity by means of the instalments of an exciting novel. Something resembling the feuilleton is not uncommon in the newspapers of other nations, but none of these imitations possess the peculiar and distinctive excellences of the French supplement.

FEVER (from *ferveo*, to burn). This term, which may be defined as a condition of the body characterized by an increase in temperature, is used in medicine with a wide application. Fever is one of the most common accompaniments of diseases in general, and serves to make the distinction between *febrile* and *non-febrile* ailments. In many cases the fever must be regarded as only secondary to, and symptomatic of, the morbid state with which it is found associated. But there is a large class of diseases in which fever is the predominant factor, and which, although differing widely among themselves as to their characters and pathological manifestations, are believed to arise from the introduction into the system of something of the nature of a poison, upon which all the morbid phenomena depend. To such diseases the term primary or specific fevers is applied.

In considering the general subject of fever regard must be had in particular to the two main features of the febrile process,—viz., the abnormal elevation of temperature, and the changes affecting the tissues of the body in reference thereto. Indeed, the two points are inseparably associated.

The average heat of the body in health ranges between 98·4° and 99·5° F. It is liable to slight variations from such causes as the ingestion of food, the amount of exercise, and the temperature of the surrounding atmosphere. There are, moreover, certain appreciable diurnal variations, the lowest temperature being between the hours of 1.30 and 7 A.M., and the highest between 4 and 9 P.M., with trifling fluctuations during these periods.

The development and maintenance of heat within the body is generally regarded as depending on the destructive oxidation of all its tissues, consequent on the changes continually taking place in the processes of nutrition. In health this constant tissue disintegration is exactly counterbalanced by the introduction of food, while the uniform normal temperature is maintained by the due adjustment of the heat thus developed, and the processes of exhalation and cooling which take place from the emunctories of the body, particularly the lungs and skin. In the febrile state this relationship is no longer preserved, the tissue waste being greatly in excess of the food supply, while the so-called law of temperature is in abeyance. In this condition the body wastes rapidly, the loss to the system being chiefly in the form of nitrogen compounds (urea, etc.). The extent of this loss has been made the subject of research by many authorities, more particularly by Dr. Senator, whose general conclusion is that in the early stage of fever a patient excretes about three times as much urea as he would do on the same diet if he were in health—the difference being that in the latter condition he discharges a quantity of nitrogen equal to that taken in in the form of food, while in the former he wastes the store of nitrogen contained in the albumen of the tissues and blood corpuscles. The amount of fever is estimated by the degree of elevation of the temperature above the normal standard. When it reaches as high a point as 106° F. the term hyperpyrexia (excessive fever) is applied, and is regarded as indicating a condition of danger; while if it exceeds 107° or 108° for any length of time, death almost always results. Occasionally in certain fevers and febrile diseases the temperature may attain the elevation of 110°–112° prior to the fatal issue.

The clinical thermometer now in general use furnishes the physician with the means of estimating accurately the temperature and tracing its fluctuations, while the information it affords serves in many cases to indicate the particular form of fever, even at an early stage, as well as to prognosticate its probable result.

The leading general symptoms characteristic of the febrile state are certain phenomena connected with its onset, accession, and decline, necessarily modified in degree by the form the fever assumes, and by its attendant complications. The commencement is usually marked by a rigor or shivering, which may only exist as a slight but persistent feeling of chilliness, or, on the other hand, be of a violent character, and, as occasionally happens with children, find expression in the form of well-marked convulsions. Although termed the *cold stage* of fever, the temperature of the body in this condition is really increased. There are besides various accompanying feelings of illness, such as pain in the back, headache, sickness, thirst, and great lassitude. In all cases of febrile complaints it is of importance for the physician to note the occurrence of the first rigor, which in general fixes the beginning of the attack. This stage is soon followed by the full development of the febrile condition, the *hot stage*. The skin now feels hot and dry, and the temperature, always elevated above the normal standard, will often be found to exhibit diurnal variations corresponding to those observed in health,—namely, a rise towards evening, and a fall towards morning. There is in general a relative increase in the rate of the pulse and the number of respirations. The tongue is dry and furred; the thirst is intense, while the appetite is gone; the urine is scanty, of high specific gravity, containing a large quantity of solid matter, particularly urea, the excretion of which is, as already stated, remarkably increased in fever; while, on the other hand, certain of the saline ingredients, such as the chlorides, are often diminished. The bowels are in general constipated, but they may be relaxed, as is often the case in typhoid fever. The nervous system participates in the general disturbance, and sleeplessness, disquietude, and delirium, more or less violent, are common accompaniments of the febrile state. The waste of the muscles and corresponding loss of strength is very marked, and continues even although considerable quantities of nutriment may be taken.

The decline of the fever takes place either by the occurrence of a *crisis* or sudden termination of the symptoms, often accompanied with some discharge from the body, such as profuse perspiration, copious flow of thick urine, and occasionally diarrhœa, or by a more gradual subsidence of the febrile phenomena, or, as it is technically termed, a *lysis*. On the other hand, death may result either from hyperpyrexia or from gradual exhaustion, the patient often passing into the *typhoid state* (a condition of extreme prostration of the physical powers, with which are associated low delirium and coma, and which is an occasional mode of death in all acute diseases); or the fatal event may occur suddenly from syncope after slight exertion, in which case it is believed to be due to a softened state of the substance of the heart, one of the known accompaniments of fever.

Certain well-marked types of fever are recognized, these being determined by the clinical history and peculiar character and sequence of the symptoms.

The term *continued fever* is applied to those forms in which the febrile temperature persists for a more or less definite period, uninterrupted by any distinct intermission till the crisis is reached. To this type belong simple continued fever or febricula, typhus and typhoid fevers, and the eruptive fevers or exanthemata,—viz., small-pox, measles and scarlet fever. *Relapsing fever* is a form of continued fever, the chief characteristic of which is the occurrence in about a week after the crisis of a distinct relapse and repetition of all the symptoms. Occasionally second and third relapses take place.

The term *remittent* is applied to those forms of fever the course of which is interrupted by a short usually daily diminution of the febrile phenomena, followed by a recurrence of all the symptoms. Such fevers are chiefly met with in tropical climates, but occasionally continued fevers assume this form, particularly in children. The condition known as *hectic fever*, which occurs in the course of wasting diseases, is markedly remittent in its course.

In *intermittent fever* or *ague* there is a distinct periodic subsidence of the symptoms, which, according to its duration, characterizes the variety as *quotidian* (where the paroxysm recurs in 24 hours), *tertian* (in 48 hours), *quartan* (in 72 hours). Intermittent fevers are most common in the tropics, and are believed to be due to malarial poisoning.

The term *malignant* is employed to describe forms of fever in which the blood appears to undergo rapid deteriorating changes, sometimes designated blood-poisoning. Yellow fever may be said to belong to this category, and the continued fevers, more especially typhus and the exanthemata, occasionally assume a malignant form from the beginning. The chief forms of fever will be found described in detail under separate headings.

With respect to the treatment of the febrile condition in general, it may be remarked that modern therapeutics have furnished several methods of great importance and efficacy. It will be sufficient to refer to two of these,—namely, the external application of cold, and the administration of antipyretic remedies or febrifuges. The former of these methods is accomplished by means of baths in which the fever patient is placed, the water being somewhat below the febrile temperature, and gradually cooled down by the addition of cold water till a temperature of from 60°–70° is reached. This process, when continued for only a short time and frequently repeated, has been found to yield most valuable results in many instances of high temperature, both in continued fever and in such febrile ailments as acute rheumatism. The relief to the patient is remarkable, the body rapidly parting with its heat, and the effect usually continues for hours. The explanation suggested by Professor Binz is that "in fever the vessels of the skin are generally much contracted. The cool water acts as a strong stimulant on them, and causes a somewhat stronger contraction to take place, but this is only of short duration. Relaxation for a longer time is the necessary consequence. The hitherto bloodless and dry skin becomes filled and moist, and thus the irradiation of warmth goes on. The cooler the bath the longer it lasts."

Certain drugs possess the power of reducing the heat of fever, and are now largely employed for this purpose. The most important of these is quinine, which, when administered in large doses (gr. x.–xxx.), has a marked effect in lowering the febrile temperature, and, if repeated, of keeping it down. It has been supposed that this effect of quinine is due to its action as an antiseptic upon the poison in the blood giving rise to the fever; but there seems a greater degree of probability in the view that it acts as an antitriptic by retarding those excessive tissue changes with which the development of heat is undoubtedly connected. This opinion is strengthened by the fact that after the administration of quinine the amount of urea discharged from the body is greatly diminished. It is said that quinine acts best at those periods of the day when the febrile temperature is inclined to undergo slight remission. Many other substances are used for their antipyretic action, among which may be mentioned digitalis, aconite, salicin, salicilic acid, etc. Alcohol is strongly recommended by some physicians for this purpose, but while its effect in large doses is no doubt to lower the temperature, its extensive employment in fever is objectionable on many important grounds. (J. O. A.)

FEYDEAU, Ernest-Aimé (1821–1873), a French author, was born in Paris, March 16, 1821. He began his literary career in 1844, by the publication of a volume of poetry of that mediocre quality which in poetry is fatal. Either the partial failure of this literary effort, or his marriage soon afterwards to a daughter of the economist Blanqui, caused him to forsake for a time the vocation of letters, and to devote his ambition to exchange transactions; but the study of archæology gradually supplanted his interest in speculation, and he was finally confirmed in his original choice of a literary profession by the remarkable success which attended the publication, in 1858, of his novel *Fanny*, a success due chiefly to the cleverness with which it depicted and excused the corrupt manners of a certain portion of French society. *Fanny* was followed in rapid succession by a series of fictions, in which immorality was gilded with the same alluring glitter, but, wanting the attraction of novelty, they failed to produce such a marked impression as their predecessor; and as their interest depended little on the portrayal of any but the lower traits of character, and chiefly on the description of intrigues, they were read and admired only within a limited circle. Besides his novels Feydeau wrote several plays, none of which, however, attained much popularity; and he is also the author of *Histoire générale des usages funèbres et sépultures des peuples anciens*, 3 vols., 1857–61; *Le Secret du Bonheur* (sketches of Algerian life), 2 vols., 1864, English translation, 2 vols., 1867; and *L'Allemagne en 1871*, Paris, 1872, a clever caricature of German life and manners, but characterized in many places by a somewhat *blasé* tone, and disfigured here and there by bitterness of feeling. He died at Paris, October 28, 1873.

See Sainte-Beuve, *Causeries du Lundi*, vol. xiv., and Barbey d'Aurevilly, *Les œuvres et les hommes au XIX*^{e} *siècle*.

FEZ, one of the chief cities in the empire of Morocco, into which kingdom it was incorporated in the year 1548. It is situated in 34° 6′ 3″ N. lat. and 4° 58′ 15″ W. long., being about 197 miles N.E. of Morocco, 100 miles E. from the Atlantic, and 85 miles S. of the Mediterranean.

The city is beautifully situated on the slopes of a pear-shaped valley, through which flows the Wad-el-Jubar (or River of Pearls). The stream is fordable throughout, and is an affluent of the Wad-el-Sebu, which it joins about six miles to the north of the town. The Wad-el-Jubar divides the city into two quarters, the ancient town (Fas-el-bali) on the right bank, and the new (Fas-el-djedid) on the left.

Like many Oriental cities, Fez from a distance is a peculiarly striking looking place. It stretches out between low hills, crowned by the ruins of ancient fortresses; and from the turreted walls stand out in bold relief countless domes, minarets, and flat-roofed houses. The old battlemented wall, which still surrounds the place, though falling into decay, is yet flanked by strong masonry towers. The surrounding country is well cultivated. In some places the view is marvellous. The whole neighborhood seems covered with ruined buildings of every sort,—cells of recluses, broken columns, massive stone aqueducts, dome-like tombs, dilapidated forts, and ruined houses. Except on the south side the city is surrounded by hills interspersed with groves of orange, pomegranate, and various fruit trees, and large olive gardens.

The interior of the city is far from pleasing; the walls are lofty, and the streets are narrow and dirty.[1] In the old town, where is the chief emporium of trade, there is one long narrow street running the entire length of the town. It is irregularly paved with round pebbles about the size and shape of a cocoa-nut; these worn smooth by the tread of slippered feet are sore stumbling blocks to the few equestrians who chance to ride through the town. Compared to its fellows this is a wide street,—that is, it varies from 6 to 9 feet in breadth.

The tradesman usually sits cross-legged in a corner of his shop, with his goods so arranged that he can reach them without moving. As a rule, men of a trade congregate together, using the cellars underneath the shop as working places. No stock of goods is kept on hand; they are only made to order. The houses generally consist of two or three stories, with a trellis-work veranda on the roof. They are lighted with wooden gratings in the side streets. The windows all look into the courtyards, so that the traveller sees only the gloomy prospect of a lofty blank wall.

In olden times Fez was the great seat of learning in western Africa. Leo Africanus states in his work that there were not only 700 mosques, but a large university, numerous theological schools, and one of the finest libraries in the world. Now, however, all that is changed. Dr. Leared, who visited the city in 1877, endeavored in vain to gain access to some small collections of ancient books and manuscripts in connection with the mosques. The two chief mosques are the Caroubin, which is very large, and is said to contain a glass lustre holding 500 lamps, the spoil of some Christian church, and one named after Edris, the reputed founder of the city. The latter is a place of refuge for criminals, and the former has a special court for women to pray in—a most unusual thing in mosques. The palace gardens are fairly well kept; one of them, a beautifully wooded plot of ground on the banks of the river, contains some magnificent myrtles, rising to a height of 40 feet, with trunks like forest trees, and there are fruit and other trees in great variety. The palace, called Lallah Almina, built as usual of a mixture of clay and lime, is situated about two miles from the town; the courtyard, which is 100 paces long by 50 wide, is paved with highly glazed and very effectively colored tiles. This palace is said to have been built by Christian slaves, among whom were many English captives.

As a commercial town Fez is a great dépôt for the trade of Barbary, where also are collected wares brought from the east and south by caravans. The chief exports are almonds, gums, raisins, dates, caraway seeds, anise seed, citrons, capers, olive oil, honey, tallow, hides, tanned leather, ostrich feathers, lead, some gold, ivory, and gold dust, silken goods (such as bright-colored scarfs, turbans, and sashes), coarse linen, carpets, and saddlery. The "fez," or national head-dress of the Turks, is largely made. Until recent times, the city had a monopoly of the manufacture, for it was supposed that the dye which imparts the peculiar dull crimson hue of these skull-caps could not be obtained elsewhere; now, however, they are manufactured both in France and in Turkey. The dye is obtained from the juice of a small berry which grows in large quantities in the immediate neighborhood of the town, and is also extensively used in the tanning of morocco leather, one of the chief articles of export. Some gold work is made, the precious metal being brought from the interior of Africa by caravans which trade regularly with Timbuctoo. These start in the spring and autumn, and are usually about 140 days on the journey, of which only 54 are actually spent in marching. The merchants of Fez send by this means to the cities in the interior of Africa various articles of European manufacture and foreign produce, linens, muslins, fine cloths, silks, beads, brass nails, coffee, tea, and sugar, and in return they receive, gums, gold, elephants' tusks, ambergris, ostrich feathers, and slaves.

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[1] In a paper published in the *Medical Times and Gazette* of July 28, 1877, a correspondent (Dr. Leared) writes—"If there is any truth in the influence of sanitary arrangements on the public health, how is it that health is preserved at all in Moorish towns? Take for example this capital. Fez is a town of about 45,000 inhabitants, surrounded by high walls. So narrow are the streets that in many of them it would be impossible for two people to walk abreast. Even the principal streets in which business is conducted are not more than ten feet wide. Owing to the height of the houses, many of which are of three stories, and the practice of covering the street on a level with the first story with reed roofs and often with vines, the rays of the sun never reach the streets except here and there in some more open spots. The consequence of this is that the inhabitants of Fez, hardly ever exposed to the sun, are a comparatively light-complexioned race of Moors; many indeed present a pallid etiolated appearance. The shops are mere cells placed about four feet from the ground, and in these the owners sit crouched up the whole day waiting for customers. The walls of the houses and shade roofs spoken of are covered with dust and festooned with cobwebs. The streets are rarely swept, and bad smells are prevalent. It is noteworthy, however, that one never experiences the smell of sewage. The reason is not far to seek. Fez, like other Moorish towns, possesses a system of drains, and an abundant and continuous water supply. Every house of any pretension is provided with a fountain in its own courtyard, by which the drains are constantly flushed. Moreover, there is no communication between the streets and the sewers. The surface water finds its way out of the streets by other channels. The closet is usually placed just inside the street entrance of the dwelling-houses, and too often makes its presence known by a vile smell. But it is no doubt owing to the abundance of water that the bad effects of sewage fermentation are not severely felt, since the sewers open only into the houses. The drinking water of Fez is procured from a river which flows through the town, and which receives its drainage. The water almost invariably produces diarrhœa in strangers."

It is believed that Fez was built in the year 793, by a prince named Edris; and, having soon become a city of much importance, it rose to be the capital of the Mahometan states of western Africa. The Moors considered it the finest city in the world; and it is held in extreme veneration also by all Moslem inhabitants of Africa. Leo Africanus mentions it as one of the most famous resorts of pilgrims in the 16th century, as well as the principal Arabic university in the world. It is filled with tombs of holy men, which impart to it an air of sacredness. In the 10th century, when the road to Mecca was unsafe, pilgrimages were performed to Fez, instead of to the tomb of the prophet. Subsequently its schools of religion, philosophy, and astronomy enjoyed a great reputation in Africa and also throughout southern Europe, and were attended even by Christians. On the expulsion of the Moors from Spain, refugees of all sorts flocked to Fez, partly on account of the asylum it afforded as a sacred city. These bringing with them some knowledge of arts, sciences, and manufactures, for a time the city flourished; but the vices and traditional conservatism of the Moslem religion prevented permanent improvement, so that it gradually sank to the unknown and unimportant position it now occupies.

During the summer the heat is intense, but in winter the climate is excellent. Travellers differ much as to the number of inhabitants. Dr. Leared computes them at from 45,000 to 50,000, but without sufficient data. Berbers, Arabs, negroes, and Jews are the principal races dwelling in the city. The Jews suffer great persecutions and many indignities, but many of them contrive to amass money.

The best method of reaching Fez is from Tangier, the total distance being about 160 miles. The road, though a mere bridle path, is quite practicable for camels and horses. There are numerous towns and villages at suitable distances, which afford convenient halting-places for travellers.

Authorities.—Leo Africanus, Barth, Rohlfs, Edmondo de Amicis, Dr. Vogel, and Dr. Leared. (C. B. N.)

FEZZAN (the ancient *Phazania*, or country of the Garamantes), a country of the Sahara region of North Africa, forming a "kaïmakamlik" of the Ottoman vilayet of Tripoli, extends 390 miles N. to S. from the town of Bonjem, lat. 30° 40′ N., to Bir Omah, on the route from Murzuk to Bornu, in lat. 24° 10′ N.; and 420 miles E. to W. from the Akakus Mountains near Ghat in long. 10° 30′ W. to the village of Wau-Squair in long. 18° 20′ W. Its ill-defined limits run from Bonjem, within 50 miles of the Mediterranean on the north, south-westward by the Bir-el-Hassi to the Akakus range east of Ghat, thence eastward to the Bir Omah south of the village of Tejerri, from that to Wau-Squair or Wau-Namus at its south-eastern corner, and thence northward past Zella to Bonjem, embracing an area of about 156,000 English square miles, or nearly three times the extent of England.

The general form of the country is determined by the ranges of hills called the Jebel-es-Sôda or Black Mountain, and the Haruj-el-Aswad or Black Haruj, which cross it along the parallel of 28° N., forming the northern edge of a broad desert plateau and the water-parting of the Mediterranean drainage slope, and shutting off the northern region from the depressions in which lie the oases of Fezzan proper in the south.

The Jebel-es-Sôda is described by M. Duveyrier as an isolated volcanic mass in the midst of a *hammada* or bare desert plateau of white limestone. Its length E. to W. is about 170 miles. At a point near the pass by which M. Duveyrier crossed it, a summit reaches a height of 2415 feet; where Rohlfs (*Quer durch Afrika*, Leipsic, 1874) passed over it between Tripoli and Murzuk he found its height to be 2982 feet. The volcanic mass of the Haruj continues the line of the Sôda in a S. E. direction for about 150 miles, and is crossed obliquely by the caravan routes from Fezzan to Egypt. Where Von Beurmann crossed the Haruj on the route from Zella to Murzuk he estimates its height at 1660 feet. The plateau of which these ranges mark the northern edge appears to be a continuation of the great desert plateau of Tripoli called the Hammada-el-Homra, and to have a general width of about 70 miles; where it is crossed on the western route over the Sôda it is described as shingly broken table-land, scattered over with large sandstone blocks; in the neighborhood of the Haruj on the east it presents a series of ridges running in different directions 8 to 12 feet above the intermediate land. The wadis or periodically filled rain-channels which drain northward from these heights are for the most part tributaries of the Wadi-Um-el-Cheil, which is called Wadi Bel where it opens on the coast of the greater Syrtis, and of the Wadi Tamet east of the former.

The southern edge of the plateau behind the Sôda descends to the Wadi-e-Shati running east and west; then follows a latitudinal belt of about 70 miles in average width, occupied by the sand dunes of Edeyen[1] which run across the frontier from the north of the Tuareg plateau in the west, and in the east by *Serir*, the name applied to districts which differ from the hammada or true plateaus, in being less elevated and everywhere covered with coarse gravel or rounded water-worn stones, in contrast to the sharply broken blocks scattered on the higher table-lands. To this follows southward the narrower belt called the Hammada of Murzuk, of inconsiderable elevation, marked out on the north side by the Amsak ridge which falls to the Wadi-el-Gharbi and its continuation the Wadi-e-Sherki at its base, and which descends on the south to the line of *Hofra*, or slight depressions in which lie the oasis groups of Murzuk, Zuila, and Wau. Along the northern side of the Wadi-e-Sherki and Wadi-el-Gharbi, about 60 miles N. W. of Murzuk, lie the celebrated Trona lakes of Fezzan, which were first described by Dr. Vogel. They are situated in a desert of drift sand in which the camels sink up to their bellies; one of them, the Bahr-el-Daud (Dauda = "worm"), contains the remarkable shrimp noticed below. In general the surface of Fezzan does not vary greatly in elevation; its numerous wadis do not lie much below the level of the *Serir;* the height of Murzuk, for example, is estimated by Rohlfs at 1804 feet, or little below the general level of the hammada in the north.

Climate.—The average temperature of Murzuk was found by Rohlfs to be 70° F., or 6° lower than that of Ghadames on the borders of western Tripoli. This difference he accounts for by the greater winter cold, for the heat of summer is probably greater here than in Tripoli; and his meteorological tables show such low temperatures as 25° F. at sunrise on the 20th of December, or 23° F. on the 30th of January, the thermometer having fallen below the freezing point 24 times within three months. As in all the rest of the desert, the climate is a very regular one, and is in general healthy, the dryness of the air in summer making the heat more bearable than on the sea coast, where the moisture of the atmosphere hinders evaporation from the skin. Although Fezzan does not lie within the zone of the tropical rains, and scarcely touches the limit of the winter rains supplied by the Mediterranean, it is visited at rare intervals by showers from the south. An almost perpetual blue sky overhangs the desert, and the people of Fezzan are so unaccustomed to and so ill-prepared for wet weather that, as in Tuat and Tidikelt, they pray to be spared from rain. They are not dependent upon it, for water is found almost everywhere at small depths, and little trouble is required to draw it from wells worked by men or camels for the purposes of irrigation; the palm groves, indeed, require no artificial watering, since their roots strike deep enough to reach the water-bearing stratum.

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[1] "Edeyen" in Temâhag signifies dunes.—Duveyrier.

Products.—In the oases and cultivated spots of Fezzan there are generally five grain harvests in the year: in the winter months wheat and barley are sown, and in spring, summer, and autumn the various kinds of durra, especially *ksob* and *gafoli.* Ksob, first sown in March, is planted and reaped four times successively, although the last harvest in December does not ripen, so that it is used only as fodder for cattle. From year's end to year's end all kinds of vegetables could be produced, but only a few sorts, such as melons and cucumbers in summer, turnips and tubers in autumn, beans in winter, etc., are grown. Among other cultivated plants are tobacco (small and bad) and cotton. The latter flourishes, is perennial for six or seven years, and gives large pods of moderate length of staple. Olives, figs, and almonds are the chief fruits, besides the date, which is the great wealth of the land. The number of sorts of date-palm found in the oases is very large: in that of Murzuk alone more than 30 varieties are counted, the most esteemed being named the Tillis, Tuati, and Auregh. In all Fezzan the date is the staple food, not only for men, but for camels, horses, and dogs. Even the stones of the fruit are softened and given to the cattle. The huts of the poorer classes are entirely made of date-palm leaves, and the more substantial habitations consist chiefly of the same material. The produce of the tree is small, 100 full-grown trees yielding only about 40 cwts. of dates, worth about 30s. at Murzuk, and about four times that sum at Tripoli. They may generally be preserved about two years.

Domestic animals include only the camel (in two varieties, the Tebu or Sudan camel and the Arabian, differing very much in size, form, and capabilities), domestic fowls, and pigeons,—for the few horses, perhaps 50 in all Fezzan, and the miserable cattle, sheep, and goats imported, scarcely deserve mention. There are no large carnivora in Fezzan; even the hyena and jackal are absent. In the uninhabited oases gazelles and antelopes are occasionally found, but they are by no means abundant. Among birds are sparrows, swallows, ravens, falcons, and vultures; in summer wild pigeons and ducks are numerous, but in winter they seek a warmer climate. There are no remarkable insects or snakes. A species of *Artemia* or brine shrimp, about a quarter of an inch in length, of a color resembling the bright hue of the gold fish, is fished for with cotton nets in the Bahr-el-Daud before noticed, and, mixed with dates and kneaded into a paste, which has the taste and smell of salt herring, is considered a luxury by the people of Fezzan.

People.—The inhabitants of Fezzan are undoubtedly a mixed people, derived from the surrounding Teda and Bornu on the south, Tuareg of the plateaus on the west, Berbers and Arabs from the north. In color the people vary from black to pure white, but the prevailing hue of skin is a Malay-like yellow, the features and woolly hair being negro. The chief languages in use in Fezzan are, first, the Kanúri or Bornu language, which is spoken by little children before they learn Arabic, and, secondly, Arabic itself. Many understand Targish, the Teda, and Haussa languages. If among such a mixed people there can be said to be any national language, it is that of Bornu, which is most widely understood and spoken. The people of Sokna, north of the Jebel-es-Sôda, have a peculiar Berber dialect which Rohlfs found to be very closely allied to that of Ghadames. The natives of Fezzan are mild and conciliatory. As soon as one has passed the frontier of their country there is no more need to fear robbers; and this is the more remarkable since Tebus, who bear a thievish character in their own country, are very numerous. The men wear a haik or barakan like those of Tripoli, and a fez; short hose, and a large loose shirt called mansaría, with red or yellow slippers, complete their toilet. Yet one often sees the large blue or white *tobe* of Sudan and Bornu, and the *litham* or shawl-muffler of the Tuareg, wound round the mouth to keep out the blown sand of the desert. The women, who so long as they are young have very plump forms, and who are generally small, are more simply dressed, as a rule, in the barakan, wound round their bodies; they seldom wear shoes, but generally have sandals made of palm leaf. Like the Arab women they load arms and legs with heavy metal rings, which are of silver among the more wealthy; a single one of these rings sometimes weighs a French pound. The hair, thickly greased with butter, soon catching the dust, which forms a crust over it, is done up in numberless little plaits round the head, in the same fashion as in Bornu and Haussa. Little children run about naked until they attain the age of puberty, which comes very early, for mothers of ten or twelve years of age are not uncommon. Morality is at a very low stage, and the Fezzanians live a careless and happy life: every evening the sounds of music and dancing are heard.

The greater number live in huts of palm leaves, which are set up in the simplest manner; sometimes there is a small outer hut, which is plastered outside with mud, and serves as a winter dwelling; the two are then surrounded by a little palm fence. Towns, like the capital Murzuk, are either built of stone or of lumps of earth, as these may be convenient to the site, but beyond the town wall nothing is to be seen but palm huts.

The houses are generally one-floored, and have one or two rooms; sometimes there is a little courtyard; all are windowless, and have only a low doorway. Dates, as has been already noticed, form the staple food, and camels' flesh is only eaten in the towns. In Murzuk, on an average, three camels are slaughtered every day, with one sheep and one goat, which serve for the whole population without and within the walls of about 8000.

With regard to the numbers of the population of Fezzan the estimates of various travellers, in the absence of any trustworthy data, are widely different. Hornemann gives 70,000 to 75,000, Richardson only 26,000, Vogel 54,000. Rohlfs, who visited Fezzan at a prosperous period in 1865, believes the number 200,000 to be a moderate estimate; but Nachtigal, in 1870, thinks the whole population cannot exceed 40,000.

Government.—Fezzan is governed by a kaïmakam or lieutenant-governor, under the governor of the vilayet, province, or regency of Tripoli. At the time of Rohlfs's visit, the twelve mudirates or districts into which it had formerly been divided had been reduced to seven, but the Government was on the point of restoring the twelve districts, and of marking out their limits more distinctly. These districts are those of Bonjem, Sokna, Shati, Temenhint, Sebha, Wadi Sherki, Wadi Gharbi, Hofra, Sherguîa, Zella, Rhodua, and Gatron. All the mudirs are appointed by the kaïmakam of Fezzan, and deposed by him, if he should see fit, without reference to the mushir of Tripoli. The government is like that of the other Turkish provinces, practically absolute—for the will of the kaïmakam or the mudir is law—although in form constitutional, since a mijelis or council, in most cases only imaginary, is supposed to have a voice in the legislature.

Although the inhabited parts of Fezzan are naturally rich and fertile, the Turkish Government shows little skill in taking advantage of its resources. Under the most favorable circumstances the direct revenue of the country amounts to about 800,000 piastres, or about £72,000. Besides this, however, the Government receives a large sum from the sale of dates. Round Murzuk alone the number of palm trees belonging to the Government is reckoned by Rohlfs at a million. The direct receipts serve to salary the officials, including the kaïmakam and the troops, who, however, are not very regularly paid. Except it may be a present of slaves or other articles sent by the kaïmakam, not a farthing passes to Tripoli or Constantinople. On the contrary, all clothing, arms, even provisions, such as rice, sugar, and coffee for the soldiers, come from Tripoli or Stamboul. At the time of M. Duveyrier's visit the garrison of Murzuk consisted of 250 men of the regular Ottoman army (redîf), nearly all natives of Fezzan or negroes. At a later date Rohlfs found a garrison of 500 men.

Trade.—The commerce of Fezzan is unimportant, and has never been great. The country serves as a dépôt or middle station between Bornu and its surrounding negro states in the south and Tripoli and Egypt in the north, the caravan routes between these countries passing through it and centring at Murzuk. In later times the slave trade seems rather to have increased than diminished; the slaves are partly sent on to be sold in Tripoli and Tunis, partly by Aujila towards Egypt. The whole number that pass northward by the main caravan route from Kuka in Bornu is estimated at 10,000 annually.

Towns.—Murzuk, the present capital, lies in the western corner of the Hofra depression, in lat. 25° 55′ N. and long. 14° 10′ E. It was founded about 1310. One of the earliest buildings was the kasbah in the west of the town. The Turks have restored it as well as the wall of the town, which forms almost a perfect square. The town is cut in two by a wide street, the *dendal,* with shops on each side, which open at each end to the chief gates. The population within its walls is estimated by Rohlfs at 3000, excluding the garrison of 500 men; with its extra-mural huts it may have 8000 inhabitants. In its main streets a busy market is held in which provisions, meat, bread, and vegetables are bought; but it is insignificant in comparison with some of the other markets of the Sahara, such as that of Abuam in Tafilet. There are two Turkish coffee-houses which are busily frequented. Sokna, about midway between Tripoli and Murzuk, situated on a great gravel plain north of the Sôda range, seems to stand next to Murzuk in point of importance. Its population was estimated by Vogel at 2500. The other noteworthy centres of population are—Zuila and Temissa, on the route towards Egypt, E. N. E. of Murzuk; Germa, or Djerma, a walled place in the Wadi Sherki, 70 miles N. W. of Murzuk, near which was the ancient capital of Garama, which gave its name to the nation of the Garamantes; Gatron (1000 inhabitants) and Tejerri on the southern route towards Bornu, the latter being the frontier castle round which a village of low mud huts has grown up; Sebha in its oasis 90 miles N. N. E. of Murzuk; Fugháa on the plateau S. W. of the Haruj-el-Aswad; and Zella at the northern base of that range.

History.—The group of oases in the south of the present country of Fezzan represents the ancient Phazania, which has had for its capitals at successive periods Germa or Djerma under the Garamantes, Garama under the Romans, Trâghen under the Nesûr, Zuila under the conquering Arabs, and Murzuk under the dynasty of Uled Mohammed, under Abd-el-Jelîl, and under the Turks. The capital of the Garamantes is found under the name of Djerma-el-Kedîma, south of the modern Djerma (N. W. of Murzuk), in a sort of bay formed by the hill edge of Amsâk. The capital under the Nesûr is represented still by the ruins of the ancient castle of Trâghen (40 miles E. of Murzuk), Of the Garama of the Romans there remains now only one well-preserved monument, which is depicted in M. Duveyrier's work (*Les Touaregs du Nord*, Paris, 1864) situated amid ruins to the south of modern Djerma. Zuila, the Arab capital, remains as the chief place of the depression called the Sherguîa, east of the Murzuk, through which the most direct Egyptian route leads. Tradition and history are in accord in representing the most ancient inhabitants of the oases to have been the Berâuna, a name under which the Arabs group the negroes of Bornu as well as the Tebu. The oldest dynasty of the Berâuna was that of the Nesûr, originally from the Sudan. Its kings reigned at Trâghen, and were long in power before they were conquered and dethroned by an Arab tribe, that of Khormân, who reduced the people of Fezzan to a state of slavery. During this period of bondage, a sherif of Morocco, Sîd-el-Monteser-uld-Mohammed by name, on a pilgrimage to Mecca, passed through Fezzan. Yielding to the supplications of the people, on his return from the sacred city, he gathered a force of devotees and set out to liberate the Fezzanians. He defeated and expelled the Khormân Arabs, and, being elected sultan, founded the dynasty of Uled Mohammed. This dynasty, which reigned for about 550 years, advanced the interests of the country, and gradually extended its borders as far as Sokna in the north. The last of these sultans was killed in the vicinity of Trâghen in 1811 by El-Mukkeni, one of the lieutenants of Yousef-Pasha, the last sovereign of the independent Karamanli dynasty of Tripoli. El-Mukkeni now made himself sultan of Fezzan, and became notorious by his slaving expeditions into Nigritia, in which he advanced as far as Borgu, the Bahr-el-ghazal, and Bagirmi. In 1831, after the lieutenant of the Karamanli had reigned for 20 years, Abd-el-Jelîl, the celebrated chief of the Uled-Slimân Arabs, usurped the sovereign authority, and held it for ten years, during which time he maintained a contest which kept all Fezzan in a ferment. In 1841, Tripoli having meanwhile been erected into a province of the Ottoman empire, Bakir Bey was sent at the head of a column of troops to subjugate Fezzan. A battle took place at El-Bagla, not far from the sea, in which Abd-el-Jelîl was slain, and soon after this Fezzan was made a kaïmakamlik of the Ottoman empire.

From 1811 onward there is no doubt about the facts above enumerated. Previous to 1811, the documents preserved by the marabouts of Trâghen show that the dynasty of Uled-Mohammed occupied the throne of Fezzan for many centuries; but the date of its establishment, 1261, is perhaps questionable. M. Duveyrier adduces a number of proofs to show that the Berâuna above mentioned were identical with the Garamantes, so that it becomes almost a matter of certainty that at a very ancient date a negro civilization prevailed over the northern Sahara; and that this was very far advanced for its time is shown by the remains of remarkable hydraulic works, by tombs of distinct character, and by rock sculptures which record the chief facts of their history.

The most notable of the European travellers who have visited Fezzan, and to whose works the student is referred for more detailed information regarding it, are, taking them in the order of date, as follows:—Hornemann, 1798; Lyon, 1819; Denham, Clapperton, and Oudney, 1822; Richardson, 1845; Barth, 1850–55; Vogel, 1854; Duveyrier, 1859–61; Von Beurmann, 1862; Rohlfs, 1865; Nachtigal, 1870. (K. J.)

FIACRE, St., an anchorite of Irish descent, who was nobly born, but renounced his worldly advantages, and sailed to France to find a solitude where he might devote himself to fasting, prayer, and the practices of charity. On reaching Meaux he addressed himself to St. Faro, the bishop of the diocese, who assigned him a dwelling in the forest of Breuil, in the province of Brie. Here Fiacre constructed a cell, and at a little distance from it an asylum for the reception of the strangers and pilgrims whom the fame of his austere life and charitable deeds soon attracted in large numbers. He died about 670, and his day is the 30th of August. He was buried in the oratory constructed by himself; and on account of the miracles reported to be performed at his shrine, it was soon resorted to by pilgrims from all parts of France. The name *fiacre* was first given to French hackney-coaches because they were used to convey pilgrims from Paris to the shrine of this saint, and started from an inn which was known by the sign of St. Fiacre. A part of the remains of the saint were in 1568 transferred to the cathedral of Meaux, and in 1627 and 1695 the grand-dukes of Florence obtained other portions of them, but some, it is said, were still left in their old place of sepulture. St. Fiacre is patron of the province of Brie, and patron saint of gardeners.

FIARS PRICES, in the law of Scotland, are the average prices of each of the different sorts of grain grown in each county, as fixed annually by the sheriff, usually after the verdict of a jury; and they serve as a rule for ascertaining the value of the grain due to feudal superiors, to the clergy or to lay proprietors of teinds, to landlords as a part or the whole of their rents, and in all cases where the price of grain has not been fixed by the parties. It is not known when or how the practice of "striking the fiars," as it is called, originated. It probably was first used to determine the value of the grain rents and duties payable to the crown. In confirmation of this view it seems that at first the duty of the sheriff was merely to make a return to the Court of Exchequer of the prices of grain within their counties, the court itself striking the fiars; and from an old case it appears that the fiars were struck above the true prices, being regarded rather as punishments to force the king's tenants to pay their rents than as the proper equivalent of the grain they had to pay. Co-existent, however, with these fiars, which were termed sheriffs' fiars, there was at an early period another class called commissaries' fiars, by which the values of teinds were regulated. They have been traced back to the Reformation, and were under the management of the commissary or consistorial courts, which then took the place of the bishops and their officials. They have now been long out of use, but they were perhaps of greater antiquity than the sheriffs' fiars, and the model upon which these were instituted. In 1723 the Court of Session passed an Act of Sederunt for the purpose of regulating the procedure in fiars courts. Down to that date the practice of striking the fiars was by no means universal over Scotland; and even in those counties into which it had been introduced, there was, as the preamble of the Act puts it, "a general complaint that the said fiars are struck and given out by the sheriffs without due care and inquiry into the current and just prices." The Act in consequence provided that all sheriffs should summon annually, between the 4th and the 20th of February, a competent number of persons, living in the shire, of experience in the prices of grain within its bounds, and that from these they should choose a jury of fifteen, of whom at least eight were to be heritors; that witnesses and other evidence as to the price of grain grown in the county, especially since the 1st of November preceding until the day of inquiry, were to be brought before the jury, who might also proceed on "their own proper knowledge;" that the verdict was to be returned and the sentence of the sheriff pronounced by the 1st March; and further, where custom or expediency recommended it, the sheriff was empowered to fix fiars of different values according to the different qualities of the grain. It cannot be said that this Act has remedied all the evils of which it complained. The propriety of some of its provisions has been questioned, and the competency of the court to pass it has been doubted, even by the court itself. Its authority has been entirely disregarded in one county—Haddingtonshire—where the fiars are struck by the sheriff alone, without a jury; and when this practice was called in question, the court declined to interfere, observing that the fiars were better struck in Haddingtonshire than anywhere else. The other sheriffs have in the main followed the Act, but with much variety of detail, and in many instances on principles the least calculated to reach the true average prices. Thus in some counties the averages are taken on the number of transactions, without regard to the quantities sold. In one case, in 1838, the evidence was so carelessly collected that the second or inferior barley fiars were 2s. 4d. higher than the first. Formerly the price was struck by the boll, commonly the Linlithgowshire boll; now the imperial quarter is always used.

The origin of the word fiars is uncertain. Jamieson, in his *Dictionary*, says that it comes from the Icelandic *fe*, wealth; Paterson derives it from an old French word *feur*, an average; others connect it with the Latin *forum*. On the general subject of fiars prices see Paterson's *Historical Account of the fiars in Scotland*, Edin., 1852; Connell, *On Tithes*, vol. i. 431; Hunter's *Landlord and Tenant*, 4th ed., ii. 290.

FIBRES, TEXTILE, in their widest acceptation include all substances capable of being spun, woven, or felted; but there are many materials and preparations, which, though they can be and actually are woven, yet do not come within the range of fibres as technically understood. Thus metallic wires, although both spun into ropes and woven into wire-cloth for numerous purposes, are not generally reckoned among textile fibres, nor is horse-hair so regarded; it would, however, be difficult to frame a general definition that would not include such substances. Excluding these, and also leaving out of account fibres used solely as paper-making materials, there yet remain an enormous variety of materials more or less used and recognized as textile fibres. It is true that those of any considerable importance are comparatively few; but frequent additions are being made to the list of fibres of general utility; and improved methods of cultivation and preparation, as well as increased facilities of transport, tend to bring into general use numerous kinds which formerly may have had only local and limited applications. All textile fibres of recognized commercial importance will be found noticed in detail under their special headings; and it is only proposed here to classify commercial fibres generally, and to note some points of interest common to all.

Fibres of animal origin are few, but of the highest value, while vegetable fibres are of endless variety, and of the most diverse character as to qualities and general utility. Animal fibres may be comprehended under two heads, silk and wool, using the terms in an extended sense. Silk of commerce is obtained from several species of moth or silkworm; and as wool there may be enumerated that produced by the numerous varieties of sheep, the mohair and cashmere wool obtained from varieties of goat, camels' hair or wool, alpaca, and vicugna wool (see ALPACA, WOOLLEN MANUFACTURES, etc.). Several other animal fibres or hairs, and notably rabbit fur, are employed for felting, and the long fine hair of various animals has been occasionally woven into useful fabrics, without becoming recognized commercial staples. Animal fibres are closely related to each other in chemical composition, sharing their leading characteristics in common with all epidermic products, hair, horn, nails, feathers, etc. They belong to the nitrogenous or albuminoid group of substances, and are in composition intimately related to albumen, gelatin, and fibrin. They are insoluble in water or alcohol, but solutions of caustic alkalies cause them to swell up, and if boiled in these they dissolve with decomposition and the evolution of ammonia. Into the composition of wool sulphur enters, whereas the nitrogenous constituents of silk, which embrace albumen, gelatin, and a peculiar compound called fibroin, are free from that element. As is well known, these animal fibres yield a peculiar odor, like burning horn or feathers, on being ignited, and they carbonize with some difficulty only on the continued application of heat.

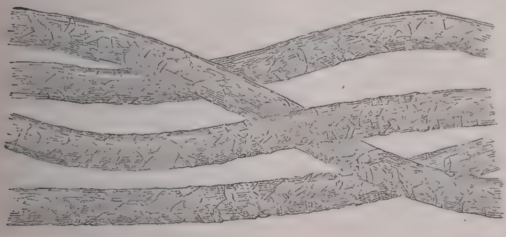
FIG. 1.—Fibre of Sheep Wool (S. India).

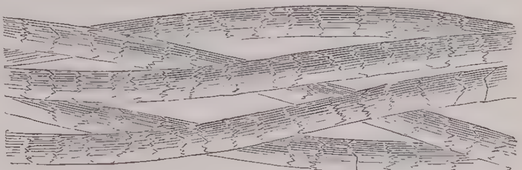
FIG. 2.—Fibre of Wool of Cashmere Goat.

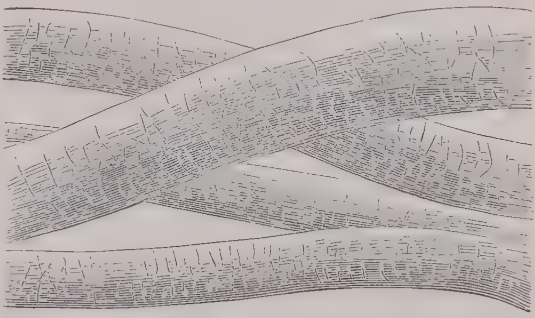
FIG. 3.—Fibre of Alpaca Wool.

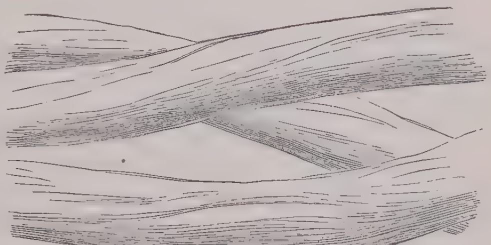
FIG. 4.—Bengal Silk Fibre.

Chemically, vegetable fibres show a similar intimate relation to each other, the basis of all being cellulose, a compound allied in ultimate composition to the carbohydrates, starch and sugar, but possessing very marked and distinctive characters. In particular, cellulose exhibits a remarkable indifference or resistance to the action of chemical reagents which affect allied substances and the bodies with which it is associated in growing plants. It is to this power of resisting change that its value for textile purposes is due, and on the same peculiarity is also based the ordinary method of separating fibres from other vegetable principles with which they are in general associated. Although cellulose is, however, practically unaffected by the ordinary solvents, water, alcohol, ether, benzol, and weak solutions of acids and alkalies even at high temperatures,

Name of Fibre.	Source.	Locality.	Remarks.
I. Seed Hairs—			
Cotton	*Gossypium barbadense*	U. S. America	See Cotton, vol. vi.
"	*G. conglomeratum*	West Indies.	
"	*G. herbaceum*	India.	
"	*G. acuminatum*	South America.	
"	*G. arboreum*	India.	
Silk Cotton	*Eriodendron anfractuosum*	Sunda	Used only for stuffing.
" (Ceiba)	*Bombax Ceiba*	West Indies	
"	*B. heptaphyllum*	Brazil	
"	*Eriodendron Saumama*	"	
"	*E. caribæum*	West Indies	
"	*Ochroma lagopus*	"	
"	*Chorisia speciosa*	"	
Vegetable Silk	*Beaumontia grandiflora*	India	Used only occasionally for stuffing.
"	*Strophanthus*	Senegal	
"	*Calotropis gigantea*	India	
"	*C. Hamiltonii*		
"	*Asclepias curassavica*	West Indies	
"	*A. volubilis*	"	
"	*A. syriaca*	North America	
"	*Marsdenia* (Sp.?)	"	
II. Bast Fibres of Dicotyledonous Plants—			
Flax	*Linum usitatissimum*	North Europe, etc	See Flax.
Hemp	*Cannabis sativa*	"	See Hemp.
Sunn Hemp	*Crotalaria juncea*	India	Used for cordage as a substitute for hemp.
Jubbulpore Hemp	*C. tenuifolia*	"	
Gambo or Ambaree	*Hibiscus cannabinus*	"	Resembling and used like jute.
Sida Fibre	*Sida retusa*, and other species	India and Australia	A cordage fibre.
Yercum or Ak	*Calotropis gigantea*	India	A valuable fibre, difficult of extraction.
Jetee	*Marsdenia tenacissima*	"	Similar to the above.
——	*Apocynum venetum*	South Russia, Siberia, and Central Asia	Prepared like flax, and much used locally.
——	*A. sibiricum*		
Nettle Fibre	*Urtica dioica*	Europe	Occasionally tried for textiles and paper.
"	*U. urens*		
Hemp Nettle	*U. cannabina*	Siberia	Used only in their native countries.
"	*U. argentea*	South Sea Islands	
"	*U. Japonica*	Japan	
Nilgherry Nettle	*U. heterophylla*	India and China	Cultivation restricted on account of the sting.
Alleghanian Nettle	*Laportea pustulata*	U. S. America.	
China Grass	*Böhmeria nivea*	Eastern Asia	Closely allied fibres. See Rhea.
Rhea or Ramie	*B. tenacissima*	"	
" "	*B. sanguinea*	Java	
Puya	*B. puya*	Nepal	
Jute	*Corchorus capsularis* *C. olitorius*	Bengal	See Jute.
Rai bhenda	*Abelmoschus tetraphyllos*	India	Used in India like jute, which they resemble.
Dhenros or Ochro	*A. esculentus*	"	
Porush	*Thespesia lampas*	"	Used like sunn hemp.
——	*T. populnea*	South America	Used for coffee bags in British Guiana.
Bun-ochra	*Urena sinuata*	Bengal.	
Mahwal	*Bauhinia vahlii*	India	Makes exceedingly tough, useful ropes.
Bun-raj	*B. racemosa*	"	
Narwali	*Cordia latifolia*	"	Used for coarse cloth, twine, and nets.
Sebestena	*C. angustifolia*	"	
Lime Tree Bast	*Tilia europæa*	Europe	Extensively used for mats, etc.
Tapa "	*Broussonetia papyrifera*	South Sea Islands	Beaten into native cloth.
Baobab "	*Adansonia digitata*	West Africa	Cordage and paper making.
Sterculia "	*Sterculia villosa*	India	Cordage.
Wawla "	*Holoptelea integrifolia*	West Indies	Not strong.
Warang "	*Kydia calycina*	"	Like lime bast.
Cuba "	*Hibiscus elatus*	"	For cigarette wrappers.
Rameta "	*Lasiosyphon speciosus*	Deccan	A very strong and almost colorless bast.
Chitrang "	*Sponia Wightii*	India	Like the above.
Lace Bark	*Lagetta lintearia*	West Indies	Ornamental purposes.
Pine Wool	*Pinus silvestris*	Germany	Surgical wadding.
III. Fibrous Bundles of Monocotyledonous Plants—			
Phormium, or New Zealand Flax.	*Phormium tenax*	New Zealand	See Phormium.
Manila Hemp	*Musa textilis*	East Indian Archipelago.	Ship cordage, etc.
Plantain Fibre	*Musa paradisiaca*, and other species.	Tropical regions	Cordage.
Bowstring Hemp	*Sanseviera zeylanica*	India, Ceylon, etc	A strong fibre.
Sisal or Grass Hemp	*Agave sisaliana*	Central America	Cordage, brush-making, etc.
Agave Fibre	*Agave americana*, and other species.	West Indies, etc	
Silk Grass	*Bromelia karatas*	South America	Cordage.
Pina Fibre	*Bromelia Pinguin*	Philippine Islands	Woven into extremely fine textures.
Vegetable Horsehair	*Tillandsia usneoides*	Central America, etc	Upholstery purposes, like horse-hair.
Vacoua or Screw Pine	*Pandanus odoratissimus*	Mauritius	Leaf strips used for matting, etc.
Panama Screw Pine	*Carludovica palmata*	Central America	Panama hats from leaf strips.
——	*Raphia ruffia*	Madagascar	Used for fine mats, etc.
——	*Chamærops excelsa*	China	
Crin Vegetal	*Chamærops humilis*	Algeria	Substitute for horse-hair in stuffing.
Tucum	*Astrocaryum vulgare*	Brazil	Fine twine for hammocks.
Tibisire	*Mauritia flexuosa*	"	Cordage.
Cabbage Palm	*Corypha australis*	Australia	Used for hat making.
Talipat	*Borassus flabelliformis*	India	Matting, baskets, etc., from leaf strips.
Kitul	*Caryota urens*	Ceylon	From base of leaf stalks, for brushes, cordage, etc.
Piassava	*Attalea funifera*	Brazil	
Gomuti	*Arenga saccharifera*	Java, etc	Native ship ropes.
Ratan	*Calamus rotang*, and other species.	East Indian Islands	Strips for chair seats; fibres for stuffing.
Coir	*Cocos nucifera*	Ceylon, etc	See Coir.

yet under certain circumstances its physical qualities of strength and elasticity may be very seriously damaged without any appearance of chemical change. Strong solutions of acids and alkalies, especially if aided with heat, act upon cellulose by first swelling up the fibres; this is followed by their complete solution, and ultimately a change of chemical constitution takes place, the cellulose being transformed into glucose or grape sugar. Oxydizing agents again exercise a destructive influence upon cellulose, a fact of great importance in connection with bleaching operations, which are all based upon the action of various oxidizing media. Cellulose is completely dissolved by ammoniacal solution of oxide of copper, and from its solution it may be precipitated chemically unchanged by treatment of the solution with acids.

The physical condition of fibrous substances is, however, for textile purposes, of much more importance than their chemical purity. The length and strength of the fibre, its fineness and elasticity, and its color are all considerations of the first importance. The period at which the fibre-yielding plants are collected, and the various processes through which all the raw materials, with the exception of cotton and other seed hairs, pass to free the fibres, exercise important influences on the strength, elasticity, and original color of the fibres. The almost invariable method by which vegetable fibres are freed from associated substances consists in retting or rotting, a process which will be fully described under FLAX.

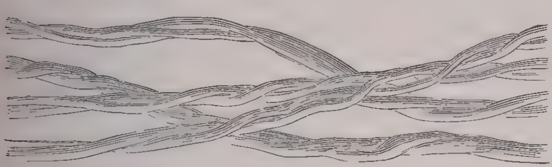

FIG. 5.—Fibre of Sea-Island American Cotton.

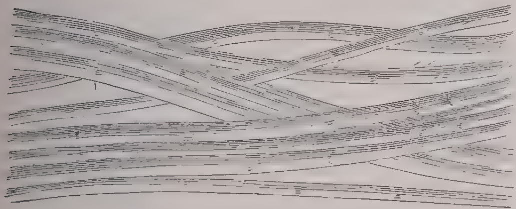

FIG. 6.—Cleaned Rhea Fibre.

In the accompanying table are embraced all the fibrous substances of vegetable origin which have hitherto been employed for textiles and cordage, etc., to any considerable extent. It is compiled from Dr. H. Müller's "Pflanzenfaser" in Hofmann's *Bericht über die Entwickelung der chemischen Industrie,*—a paper to which we owe other obligations.

The more closely vegetable fibres approximate to a condition of absolute purity, the greater becomes the difficulty of distinguishing them from each other by any chemical tests. As, however, more or less incrusting substance adheres to all bast fibres in their raw condition, they exhibit certain reactions by which, in that condition, they can be separately recognized, but such tests are of little practical value. More definite and important results can be obtained by microscopical examination, as certain peculiarities of minute structure are retained by fibres with great persistency. The microscopic distinction of allied fibres is, however, a difficult task, requiring much experience and discrimination. Cotton and other seed hairs, which consist of single elongated cells or tubes, are of course easily distinguished from other vegetable fibres which are composed of aggregated cells; and still more marked is the difference between vegetable fibres and wool and silk respectively. The accompanying woodcuts show the microscopic appearance of wool, silk, cotton, rhea, and flax fibres, magnified in each case 320 diameters. As wool, silk, and vegetable fibres present marked differences of chemical character, they can be readily recognized in any mixed fabric by appropriate tests. Thus aniline dyes, which communicate strong permanent colors to wool and silk, only produce on vegetable fibres a fugitive, easily-washed-out stain. Vegetable fibres in a mixed fabric may be distinguished by boiling a fragment of the material in a solution containing 10 per cent. of soda, whereby the animal fibres dissolve, leaving the vegetable fibres. By filtration and subsequent purifying of the undissolved remains, the proportion of vegetable fibre may be ascertained. The alkaline filtrate treated with acetate of lead gives a white precipitate for silk and black for wool. The sulphur contained in wool, from which silk is free, gives a ready means of distinguishing a mixture of these two fibres. In a solution of plumbate of soda wool becomes black, while silk is quite unaffected. (J. PA.)

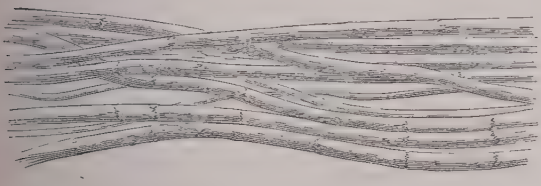

FIG. 7.—Fibre of Rough Russian Flax.

FIBRIN, or FIBRINE, is a member of the important group of albuminoid or proteinous substances which, embracing albumen, casein, gluten, and other allied compounds, constitute essential principles of animal and of the higher vegetable organisms. The substances are distinguished among themselves more by physical peculiarities and properties than by distinctions of chemical constitution, which, indeed, is so variable as to point to the conclusion that the various principles are not to be regarded as definite chemical compounds. In a physiological sense fibrin results from the union of two albuminoids which exist separately in the blood, fibrinogen and the fibrinoplastic substance. The body is most readily obtained by lashing blood-clot with a loose bundle of twigs, when the substance will attach itself to the twigs in a filamentous condition. On being purified by washing with water, it forms a soft elastic transparent or whitish mass of filaments, which have no tendency to cohere. When permitted to dry in the air it becomes a hard horny mass, with a yellowish or greenish tinge. Fibrin is quite insoluble in water, but boiled under pressure, or with long continued boiling, it dissolves with a change of its structure. It is unaffected by alcohol or ether, but in presence of dilute acids and weak alkalies it is gradually dissolved. Its average percentage composition is thus stated:—Carbon 52·6, hydrogen 7·6, nitrogen 17·4, oxygen 21·8, sulphur 1·2. The analogous product obtained from muscular tissue is termed syntonin. Vegetable fibrin is that portion of the nitrogenous constituents of cereal grains and similar seeds which is insoluble in alcohol. Fibrin, although a substance of the highest physiological interest, and of the utmost importance as a constituent of food, has hitherto, unlike albumen, casein, and gluten, found no special application as a separate industrial product.

FICHTE, JOHANN GOTTLIEB (1762–1814), one of the most eminent of modern German metaphysicians, was born at Rammenau in Upper Lusatia on the 19th May, 1762. His father, a ribbon-weaver in that village, was of Swedish origin, the first of the Fichte family having been a soldier in the army of Gustavus Adolphus, who was left wounded at Rammenau and settled there. All of the race were distinguished for piety, uprightness, and solidity of character. With these qualities Fichte himself combined a certain impetuosity of temper and impatience which were probably derived from his mother, a woman of somewhat querulous and jealous disposition. At a very early age the boy showed remarkable mental vigor and moral independence. A fortunate accident brought him under the notice of a neighboring nobleman, Freiherr von Miltitz, and was the means of procuring him a more excellent education than his father's circumstances would have allowed. By Von Miltitz he was placed under the care of Pastor Krebel at Niederau, who prepared him admirably for higher school instruction. After a short stay at Meissen he was then entered at the celebrated school or seminary at Pforta, near Raumburg. In 1780, after six years' residence at Schulpforta, Fichte, whose patron Von Miltitz had unfortunately died, entered the university of Jena as a student of theology. His means did not permit him to prosecute an uninterrupted course of study; he supported himself mainly by private teaching, and during the years 1784–1787 acted as tutor in various families of Saxony. In 1787, after an unsuccessful application to the consistory for some pecuniary assistance, such as was frequently given to poor students of theology at the Saxon universities, he seems to have been altogether driven to miscellaneous literary work. A tutorship at Zurich was, however, obtained in the spring of 1788, through his friend Weisse, and Fichte spent in Switzerland two of the happiest years of his life. He made several valuable acquaintances, among others Lavater and his brother-in-law Hartmann Rahn, to whose daughter, Johanna Maria, he became engaged before leaving Zurich in 1790.

Settling at Leipsic, Fichte still found himself without any fixed means of livelihood, and was again reduced to literary drudgery, writing tales, plays, and reviews for the popular magazines. In the midst of this distracting work occurred the most important event of his life, his introduction to the philosophy of Kant. That Fichte had been already interested in philosophico-theological questions we know, but up to this period his speculations had been but desultory. At Schulpforta he had read with delight Lessing's *Anti-Goeze*, and during his Jena student days had occupied himself with the difficult problem of the relation between philosophy and religion. The outcome of his speculations, as exhibited in the fragmentary *Aphorismen über Religion und Deismus* (unpublished, date 1790; *Werke*, i. 1–8), was a species of Spinozistic determinism, regarded, however, as lying altogether outside the boundary of religion. It is remarkable that even for a time should fatalism have been predominant in Fichte's reasoning, for in character he was throughout opposed to such a view, and, as he has said, "according to the man, so is the system of philosophy he adopts." With such half-formed opinions, Kant's philosophy was a new revelation. In particular, he seized upon the practical side, in which Kant works out his view of the absolute moral law as the essence of free intelligence. This doctrine lies at the root of all Fichte's after speculations; in fact his system is merely the rigidly consistent evolution of the true relation between reason as practical and reason as cognitive.

Fichte's *Letters* of this period sufficiently attest the influence exercised on him by the study of Kant. It effected a revolution in his whole mode of thinking; and so completely did the Kantian doctrine of the inherent moral worth of man harmonize with his own character, that from this time forward his life becomes one effort to realize and perfect a true philosophy, and to make its principles no mere theoretic axioms, but practical maxims. At first he seems to have thought that the best method for accomplishing his object would be to expound Kantianism in a popular, intelligible form. He felt, and rightly, that the reception of Kant's doctrines was impeded by the clumsy and scholastic phraseology in which they were stated. An abridgment of the *Kritik der Urtheilskraft* was begun, but was left unfinished.

The circumstances of Fichte's life had not improved. No opening had presented itself, and it had been arranged in the beginning of 1791 that he should return to Zurich and be married to Johanna Rahn. This plan was overthrown by a commercial disaster which severely affected the fortunes of the Rahn family. Fichte accepted a post as private tutor to the family of a nobleman in Warsaw, and proceeded slowly on foot to that town. The situation proved unsuitable; the lady as Kuno Fischer says, "required greater submission and better French" than Fichte could yield, and after little more than a fortnight's stay, Fichte set out for Königsberg, drawn thither by the desire to see Kant. His first interview with Kant was disappointing; the coldness and formality of the aged philosopher checked the enthusiasm of the young disciple, though it did not diminish his admiration and reverence. He resolved to bring himself before Kant's notice in a more effective manner by submitting to him some paper in which the principles of the Kantian philosophy should be applied. Such was the origin of the work, written in four weeks, the *Versuch einer Kritik aller Offenbarung* (Essay towards a Critique of all Revelation). The problem which Fichte dealt with in this essay was one not yet handled by Kant himself, and the relations of which to the critical philosophy furnished matter for considerable surmise. Indirectly, indeed, Kant had indicated a very definite opinion on theology: from the *Critique of Pure Reason* it was clear that for him speculative theology must be purely negative, while the *Critique of Practical Reason* as clearly indicated the view that the moral law is the absolute content or substance of any religion. A *critical* investigation of the notion of revealed religion, an examination of the conditions under which religious belief was possible, was still, therefore, an open problem. Fichte's essay was forwarded by him to Kant, who approved it highly, extended to the author a most warm reception, and exerted his influence to procure a publisher for the work. After some delay, consequent on the scruples of the theological censor of Halle, who did not like to see miracles rejected, the book appeared at Easter, 1792. By an oversight of the publisher, Fichte's name did not appear on the title page, nor was the preface given, in which the author spoke of himself as a beginner in philosophy. Considering then the principles applied and the results reached, it was not unnatural that outsiders should ascribe the work to Kant himself. The *Allgemeine Literatur-Zeitung* went so far as to say that no one who had read a line of Kant's immortal writings could fail to recognize the eminent author of this new work. The mistake was soon rectified by Kant himself, who publicly announced the true author, at the same time highly commending the work. By this fortunate error Fichte's reputation was secured at a stroke, and he soon reaped the benefits of fame.

The *Critique of Revelation* is deserving of particular notice, since it marks the culminating point of Fichte's Kantian period. The exposition of the conditions under which revealed religion is possible turns upon the absolute requirements of the moral law in human nature. Religion itself is the belief in this moral law as divine, and such belief is a practical postulate, necessary in order to add force to the law. It follows that no revealed religion, so far as matter or substance is concerned, can contain anything beyond this law; nor can any fact in the world of experience be recognized by us as supernatural. The supernatural element in religion can only be the divine character of the moral law. Now, the revelation of this divine character of morality is possible only to a being in whom the lower impulses have been or are successful in overcoming reverence for the law. In such a case it is conceivable that a revelation might be given in order to add strength to the moral law. Religion ultimately then rests upon the practical reason, and expresses some demand or want of the pure ego or human will. In this conclusion we can trace the prominence assigned by Fichte to the practical element, and the tendency to make the requirements of the ego the ground for all judgment on reality. It was not possible that having reached this point he should not press forward and leave the Kantian position.

Fichte's literary success was coincident with an improvement in the fortunes of the Rahn family. There seemed now no reason for delaying his marriage, which accordingly took place at Zurich in October, 1793. The remainder of the year he spent in retirement at Zurich, slowly perfecting his thoughts on the fundamental problems left for solution in the Kantian philosophy. During this period also he published anonymously two remarkable political works, *Zurückforderung der Denkfreiheit von den Fürsten Europa's*, and *Beiträge zur Berichtigung der Urtheile des Publicums über die französische Revolution*. Of these the latter is much the more important. The French Revolution seemed to many earnest thinkers the one great outcry of modern times for the liberty of thought and action which is the eternal heritage of every human being. Unfortunately the political condition of Germany was unfavorable to the formation of an unbiassed opinion on the great movement. The principles involved in it were lost sight of under the mass of spurious maxims on social order which had slowly grown up and stiffened into system. To direct attention to the true nature of revolution, to demonstrate how inextricably the right of liberty is interwoven with the very existence of man as an intelligent agent, to point out the inherent progressiveness of state arrangements, and the consequent necessity of reform or amendment, such are the main objects of the *Beiträge;* and although, as is often the case with Fichte, the arguments are too formal and the distinctions too wire-drawn, yet the general idea is nobly conceived and carried out. As in the *Critique of Revelation* so here the rational nature of man and the conditions necessary for its manifestation or realization become the standard for critical judgment.

Towards the close of 1793 Fichte received an invitation to fill the post of extraordinary professor of philosophy at Jena, vacant by the transference of Reinhold to Kiel. This chair, though not in the ordinary faculty had become, through Reinhold, the most important in the university, and great deliberation was exercised in selecting his successor. It was desired to secure an able exponent of Kantianism, and none seemed so highly qualified as the author of the *Critique of Revelation.* Fichte, while accepting the call, at first desired to delay entry on his duties for a year, in order to be more thoroughly prepared; but as this was deemed inexpedient, he rapidly drew out an introductory outline of his system for the use of his students, and began his lectures in May, 1794. His success was instantaneous and complete. The fame of his predecessor was altogether eclipsed; as Forberg writes, "Fichte is believed in as Reinhold never was. The students understand him even less than they did his predecessor, but they believe all the more earnestly on that account." Much of this success was undoubtedly due to Fichte's rare power as a lecturer. In oral exposition the vigor of thought and moral intensity of the man were most of all apparent, while his practical earnestness completely captivated his hearers. He lectured not only on philosophy to his own class, but on general moral subjects to all students of the university. These general addresses, published under the title *Vocation of the Scholar* (Bestimmung des Gelehrten), were on a subject very dear to Fichte's heart, the supreme importance of the highest intellectual culture and the duties incumbent on those who had received it. Their tone is stimulating and lofty.

The years spent at Jena were unusually productive; indeed, the completed Fichtean philosophy is contained in the writings of this period. A general introduction to the system is given in the tractate *On the Notion of the Theory of Science* (Ueber den Begriff der Wissenschaftslehre, 1794), and the theoretical portion is worked out in the *Foundation of the whole Theory of Science* (Grundlage der gesammten Wissenschaftslehre, 1794), and *Outline of what is peculiar in the Theory of Science* (Grundriss des Eigenthümlichen d. Wissenschaftslehre, 1794). To these were added in 1797 a *First* and a *Second Introduction to the Theory of Science*, and an *Essay towards a new Exposition of the Theory of Science.* The *Introductions* are masterly expositions. The practical philosophy, which was with Fichte the fundamental, was given in the *Grundlage des Naturrechts*, 1796, and *System der Sittenlehre*, 1798. The last is, we think, the most important of all Fichte's works; apart from it, his theoretical philosophy is unintelligible and absurd.

During this period of literary activity Fichte's academic career had been troubled by various storms, the last so violent as to put a close to his professoriate at Jena. The first of them, a complaint against the delivery of his general addresses on Sundays, was easily got over. The second, arising from Fichte's strong desire to suppress the *Landsmannschaften*, or students' orders, which were productive of much harm, was more serious. Some misunderstanding caused an outburst of ignorant ill-feeling on the part of the students, who proceeded to such lengths that Fichte was compelled to obtain leave to reside out of Jena. The third storm, however, was the most violent. In 1798 Fichte, who, with Niethammer, had edited the *Philosophical Journal* since 1795, received from his friend Forberg an essay on the "Development of the Idea of Religion." With much of the essay he entirely agreed, but he thought the exposition in so many ways defective and calculated to create an erroneous impression, that he prefaced it with a short paper *On the Grounds of our Belief in a Divine Government of the Universe*, in which God is defined as the moral order of the universe, the eternal law of right which is the foundation of all our being. Any other mode of existence must be denied to him. Against these papers the cry of atheism was raised, and the electoral Government of Saxony suppressed the *Journal* and confiscated the copies found in their universities, acts imitated by all the German states except Prussia. The duke of Saxe-Weimar, patron of Jena university, was almost ordered to reprove and dismiss the offenders. Fichte's defences (*Appellation an das Publicum gegen die Anklage des Atheismus*, and *Gerichtliche Verantwortung der Herausgeber der phil. Zeitschrift*, 1799), though masterly, did not make the matter easier for the court of Saxe-Weimar, who strongly wished to let the affair pass quietly, and an unfortunate letter, in which he threatened to resign in case of reprimand, turned the scale altogether against him. The court arbitrarily accepted his threat as a request to resign, passed censure, and extended to him permission to withdraw from his chair at Jena; nor would they alter their decision, even though Fichte himself endeavored to explain away the unfortunate letter.

Berlin was now the only town in Germany open to him. His residence there from 1799 to 1806 was only broken by the delivery of lectures during the summer of 1805 at Erlangen, where he had been named professor. Surrounded by friends including such men as Schlegel and Schleiermacher, he continued his literary work, perfecting and amending the *Wissenschaftslehre.* The most remarkable of the works from this period are—(1) the *Bestimmung des Menschen* (Vocation of Man, 1800), a book which, for beauty of style, richness of content, and elevation of thought, may be ranked with the *Meditations* of Descartes; (2) *Der geschlossene Handelsstaat*, 1800 (The Exclusive or Isolated Commercial State), a very remarkable treatise, intensely socialist in tone, and bitterly opposed to free-trade and competition, inculcating in fact organized protection; (3) *Sonnenklarer Bericht an das grössere Publicum über die neueste Philosophie*, 1801. In 1801 was also written the *Darstellung der Wissenschaftslehre*, which was not published till after his death. In 1804 a set of lectures on the *Wissenschaftslehre* was given at Berlin, the notes of which were published in the *Nachgelassene Werke*, vol. ii. In 1804 were also delivered the noble lectures on the *Characteristics of the Present Age* (Grundzüge der gegenwärtigen Zeitalters, 1804), containing a most admirable analysis of the Aufklärung, tracing the position such a movement of thought holds in the natural evolution of the general human consciousness, pointing out its inherent defects, and indicating as the ultimate goal of progress the life of reason in its highest aspect as a belief in the divine order of the universe. The philosophy of history sketched in this work has something of value with much that is fantastic and absurd. In 1805 and 1806 appeared the *Nature of the Scholar* (Wesen des Gelehrten) and the *Way to a Blessed Life* (Anweisung zum seligen Leben oder Religionslehre), the latter the most important work of this Berlin period. In it the union between the finite self-consciousness and the infinite ego or God is handled in an almost mystical manner. The knowledge and love of God is the end of life; by this means only can we attain blessedness (Seligkeit), for in God alone have we a permanent, enduring object of desire. The infinite God is the all; the world of independent objects is the result of reflection or self-consciousness, by which the infinite unity is broken up. God is thus over and above the distinction of subject and object; our knowledge is but a reflex or picture of the infinite essence. Being is not thought.

The disasters of Prussia in 1806 drove Fichte from Berlin. He retired first to Stargard, then to Königsberg (where he lectured for a time), then to Copenhagen, whence he returned to the capital in August, 1807. From this time till his death his only published writings are practical in character; not till after the appearance of the *Nachgelassene Werke* was it known in what shape his final speculations had been thrown out. We may here note the order of these posthumous writings as being of importance for tracing the development of Fichte's thought. From the year 1806 we have the remarkable *Bericht über die Wissenschaftslehre* (*Werke*, vol. viii.) with its sharp critique of Schelling; from 1810 we have the *Thatsachen des Bewusstseyns*, published in 1817, of which another treatment is given in lectures of 1813 (*Nachgel. Werke*, vol. i.). Of the *Wissenschaftslehre* we have, in 1812–13, four separate treatments contained in the *Nachgel. Werke.* As these consist mainly of notes for lectures, couched in uncouth phraseology, they cannot be held to throw much light on Fichte's views. Perhaps the most interesting are the lectures of 1812 on *Transcendental Logic* (*Nach. Werke*, i. 106–400).

From 1812 we have notes of two courses on practical philosophy, *Rechtslehre* (*Nach. Werke*, vol. ii.) and *Sittenlehre* (*Ib.*, vol. iii.). A finished work in the same department is the *Staatslehre*, published in 1820. The gives the Fichtean utopia or state organized on principles of pure reason; in too many cases the proposals are identical with principles of pure despotism.

During these later years, however, Fichte's energies were mainly occupied with public affairs. In 1807 he drew up an elaborate and minute plan for the proposed new university of Berlin. In 1807–1808 he delived at Berlin, amidst danger and discouragement, his noble addresses to the German people (*Reden an die Deutsche Nation*). Even if we think that in these pure reason is sometimes overshadowed by patriotism, we cannot but recognize the immense practical value of what he recommended as the only true foundation for national prosperity.

In 1810 he was elected rector of the new university founded in the previous year. This post he resigned in 1812, mainly on account of the difficulties he experienced in his endeavor to alter and amend the student life of the university.

In 1813 began the great effort of Germany for national independence. Debarred from taking an active part, Fichte made his contribution by way of lectures. The addresses on the idea of a true war (*Ueber den Begriff einer wahrhaften Kriegs*, forming part of the *Staatslehre*) contain a very subtle and admirable contrast between the positions of France and Germany in the war.

In the autumn of 1813 the hospitals of Berlin were filled with sick and wounded from the campaign. Among the most devoted in her exertions was Fichte's wife, who, in January, 1814, was attacked with a virulent hospital fever. On the day after she was pronounced out of danger Fichte was struck down by the same disease. His constitution, weakened by severe illness in 1808, was unable to withstand the attack. He lingered for some days in an almost unconscious state, and died on the 27th January, 1814.

The philosophy of Fichte, worked out in a series of writings, and falling chronologically into two distinct periods, that of Jena and that of Berlin, seemed in the course of its development to undergo a change so fundamental that many critics have sharply separated and opposed to one another an earlier and a later phase. The ground of the modification, further, has been sought and apparently found in quite external influences, principally that of Schelling's *Naturphilosophie*, to some extent that of Schleiermacher. But as a rule most of those who have adopted this view have done so without the full and patient examination which the matter demands; they have been misled by the difference in tone and style between the earlier and later writings, and have concluded that underlying this was a fundamental difference of philosophic conception. One only, Erdmann, in his *Entwicklung d. deuts. Spek. seit Kant*, § 29, seems to give full references to justify his opinion, and even he, in his later work, *Grundriss der Gesch. der Philos.* (ed. 3), § 311, admits that the difference is much less than he had at the first imagined. He certainly retains his former opinion, but mainly on the ground, in itself intelligible and legitimate, that, so far as Fichte's philosphical reputation and influence are concerned, attention may be limited to the earlier doctrines of the *Wissenschaftslehre.* This may be so, but it can neither be admitted that Fichte's views underwent radical change, nor that the *Wissenschaftslehre* was ever regarded as in itself complete, nor that Fichte was unconscious of the apparent difference between his earlier and later utterances. It is demonstrable by various passages in the works and letters that he never looked upon the *Wissenschaftslehre* as containing the whole system; it is clear from the chronology of his writings that the modifications supposed to be due to other thinkers were from the first implicit in his theory; and if one fairly traces the course of thought in the early writings, one can see how he was inevitably led on to the statement of the later and, at first sight, divergent views. On only one point, the position assigned in the *Wissenschaftslehre* to the absolute ego, is there any obscurity; but the relative passages are far from decisive, and from the early work, *Neue Darstellung der Wissenschaftslehre,* unquestionably to be included in the Jena period, one can see that from the outset the doctrine of the absolute ego was held in a form differing only in statement from the later theory.

Fichte's system is one absolutely refusing to be compressed with intelligibility. We shall here note only three points:—(*a*) the origin in Kant; (*b*) the fundamental principle and method of the *Wissenschaftslehre;* (*c*) the connection with the later writings. The most important works for (*a*) are the "Review of Ænesidemus," and the *Second Introduction to the Wissenschaftslehre;* for (*b*) the great treatises of the Jena period; for (*c*) the *Thatsachen des Bewusstseyns* of 1810.

(*a*) The Kantian system had for the first time opened up a truly fruitful line of philosophic speculation, the transcendental consideration of knowledge, or the analysis of the conditions under which cognition is possible. To Kant the fundamental condition was given in the synthetical unity of consciousness. The primitive fact under which might be gathered the special conditions of that synthesis which we call cognition was this unity. But by Kant there was no attempt made to show that the said special conditions were necessary from the very nature of consciousness itself. Their necessity was discovered and proved in a manner which might be called empirical. Moreover, while Kant in a quite similar manner pointed out that intuition had special conditions, space and time, he did not show any link of connection between these and the primitive conditions of pure cognition. Closely connected with this remarkable defect in the Kantian view,—lying, indeed, at the foundation of it,—was the doctrine that the matter of cognition is altogether *given,* or thrown into the *form* of cognition from without. So strongly was this doctrine emphasized by Kant, that he seemed to refer the *matter* of knowledge to the action upon us of a non-ego or Ding-an-sich, absolutely beyond consciousness. While these hints towards a completely intelligible account of cognition were given by Kant, they were not reduced to system, and from the way in which the elements of cognition were related, could not be so reduced. Only in the sphere of practical reason, where the intelligible nature prescribed to itself its own laws, was there the possibility of systematic deduction from a single principle.

The peculiar position in which Kant had left the theory of cognition was assailed from many different sides and by many writers, specially by Schultze (Ænesidemus) and Maimon. To the criticisms of the latter, in particular, Fichte owed much, but his own activity went far beyond what they supplied to him. To complete Kant's work, to demonstrate that all the necessary conditions of knowledge can be deduced from a single principle, and consequently to expound the complete system of reason, that is the business of the *Wissenschaftslehre.* By it the theoretical and practical reason shall be shown to coincide; for while the categories of cognition and the whole system of pure thought can be expounded from one principle, the ground of this principle is scientifically, or to cognition, inexplicable, and is made conceivable only in the practical philosophy. The ultimate basis for the activity of cognition is given by the will. Even in the practical sphere, however, Fichte found that the contradiction, insoluble to cognition, was not completely suppressed, and he was thus driven to the higher view, which is explicitly stated in the later writings, though not, it must be confessed, with the precision and scientific clearness of the *Wissenschaftslehre.*

(*b*) What, then, is this single principle, and how does it work itself out into system? To answer this one must bear in mind what Fichte intended by designating all philosophy Wissenschaftslehre, or theory of science. Philosophy is to him the rethinking of actual cognition, the *theory* of knowledge, the complete, systematic exposition of the principles which lie at the basis of all reasoned cognition. It traces the necessary acts by which the cognitive consciousness comes to be what it is, both in form and content. Not that it is a natural history, or even a *phenomenology* of consciousness; only in the later writings did Fichte adopt even the genetic method of exposition; it is the complete statement of the pure principles of the understanding in their rational or necessary order. But if complete, this Wissenschaftslehre must be able to deduce the whole organism of cognition from certain fundamental axioms, themselves unproved and incapable of proof; only thus can we have a *system* of reason. From these primary axioms the whole body of necessary thoughts must be developed, and, as Socrates would say, the argument itself will indicate the path of the development.

Of such primitive principles, the absolutely necessary conditions of possible cognition, only three are thinkable,—one perfectly unconditioned both in form and matter; a second, unconditioned in form, but not in matter; a third, unconditioned in matter but not in form. Of these, evidently the first must be the fundamental; to some extent it conditions the other two, though these cannot be deduced from it or proved by it. The statement of these principles forms the introduction to Wissenschaftslehre.

The method which Fichte first adopted for stating these axioms is not calculated to throw full light upon them, and tends to exaggerate the apparent airiness and unsubstantiality of his deduction. They may be explained thus. The primitive condition of all intelligence is that the ego shall posit, affirm, or be aware of itself. The ego is the ego; such is the first pure act of conscious intelligence, that by which alone consciousness can come to be what it is. It is what Fichte called a Deed-act (*Thathandlung*); we cannot be aware of the process,—the ego *is* not until it has affirmed itself,—but we are aware of the result, and can see the necessity of the act by which it is brought about. The ego then posits itself as real. What the ego posits is real. But in consciousness there is equally given a primitive act of op-positing, or contra-positing, formally distinct from the act of position, but materially determined, in so far as what is op-posited must be the negative of that which was posited. The non-ego—not, be it noticed, the world as we know it—is op-posed in consciousness to the ego. The ego is not the non-ego. How this act of op-positing is possible and necessary, only becomes clear in the practical philosophy, and even there the inherent difficulty leads to a higher view. But third, we have now an absolute antithesis to our original thesis. Only the ego is real, but the non-ego is posited in the ego. The contradiction is solved in a higher synthesis, which takes up into itself the two opposites. The ego and non-ego *limit* one another, or determine one another; and, as limitation is negation of part of a divisible quantum, in this third act, the divisible ego is op-posed to a divisible non-ego.

From this point onwards the course proceeds by the method already made clear. We progress by making explicit the oppositions contained in the fundamental synthesis, by uniting these opposites, analyzing the new synthesis, and so on, until we reach an ultimate pair. Now, in the synthesis of the third act two principles may be distinguished:—(1) the non-ego determines the ego; (2) the ego determines the non-ego. As determined the ego is theoretical, as determining it is practical; ultimately the opposed principles must be united by showing how the ego is both determining and determined.

It is impossible to enter here on the steps by which the theoretical ego is shown to develop into the complete system of cognitive categories, or to trace the deduction of the processes (productive imagination, intuition, sensation, understanding, judgment, reason) by which the quite indefinite non-ego comes to assume the appearance of definite objects in the forms of time and space. All this evolution is the necessary consequence of the determination of the ego by the non-ego. But it is clear that the non-ego cannot really determine the ego. There is no reality beyond the ego itself. The contradiction can only be suppressed if the ego itself opposes to itself the non-ego, places it as an *Anstoss* or plane on which its own activity breaks and from which it is reflected. Now, this op-positing of the *Anstoss* is the necessary condition of the practical ego, of the will. If the ego be a striving power, then of necessity a limit must be set by which its striving is manifest. But how can the infinitely active ego posit a limit to its own activity? Here we come to the *crux* of Fichte's system, which is only partly cleared up in the *Rechtslehre* and *Sittenlehre*. If the ego be pure activity, free activity, it can only become aware of itself by positing some limit. We cannot possibly have any cognition of how such an act is possible. But as it is a free act, the ego cannot be determined to it by anything beyond itself; it cannot be aware of its own freedom otherwise than as determined by other free egos. Thus in the *Rechtslehre* and *Sittenlehre*, the multiplicity of egos is deduced, and with this deduction the first form of the *Wissenschaftslehre* appeared to end.

(*c*) But in fact deeper questions remained. We have spoken of the ego as becoming aware of its own freedom, and have shown how the existence of other egos and of a world in which these egos may act are the necessary conditions of consciousness of freedom. But all this is the work of the ego. All that has been expounded follows if the ego comes to consciousness. We have therefore to consider that the absolute ego, from which spring all the individual egos, is not subject to these conditions, but freely determines itself to them. How is this absolute ego to be conceived? As early as 1797 Fichte had begun to see that the ultimate basis of his system was the absolute ego, in which is no difference of subject and object; in 1800 the *Bestimmung des Menschen* defined this absolute ego as the infinite moral will of the universe, God, in whom are all the individual egos, from whom they have sprung. It lay in the nature of the thing that more precise utterances should be given on this subject, and these we find in the *Thatsachen des Bewusstseyns* and in all the later lectures. God in them is the absolute Life, the absolute One, who becomes conscious of himself by self-diremption into the individual egos. The individual ego is only possible as opposed to a non-ego, to a world of the senses; thus God, the infinite will, manifests himself in the individual, and the individual has over against him the non-ego or thing. "The individuals do not make part of the being of the one life, but are a pure form of its absolute freedom." "The individual is not conscious of himself, but the Life is conscious of itself in individual form and as an individual." In order that the Life may act, though it is not necessary that it *should* act, individualization is necessary. "Thus," says Fichte, "we reach a final conclusion. Knowledge is not mere knowledge of itself, but of being, and of the one being that truly is, viz., God. . . . This one possible object of knowledge is never known in its purity, but ever broken into the various forms of knowledge which are and can be shown to be necessary. The demonstration of the necessity of these forms is philosophy or *Wissenschaftslehre*" (*Thats. des. Bewuss.*, *Werke*, ii. 685). This ultimate view is expressed throughout the lectures (in the *Nachgel. Werke*) in uncouth and mystical language.

It will escape no one (1) how the idea and method of the *Wissenschaftslehre* prepare the way for the later Hegelian dialectic, and (2) how completely the whole philosophy of Schopenhauer is contained in the later writings of Fichte. It is not to the credit of historians that Schopenhauer's debt should have been allowed to pass with so little notice.

Fichte's complete works have been published by his son, J. H. Fichte; *Werke*, 11 vols. (vols. i.–viii., 1845–46; ix.–xi. *Nachgelassene Werke*, 1834); also the *Leben und Briefwechsel*, 2 vols., 1830 (2d ed. 1862). The most complete works on his philosophy are—Busse, *Fichte und seine Beziehung zur Gegenwart*, 1848–49; Löwe, *Die Philosophie Fichte's*, 1862; Noack, *Fichte nach seinem Leben, Lehren, und Wirken*, 1862; Fischer, *Geschichte d. neuern Philosophie*, v., 1868–69. See also the histories of post-Kantian philosophy by Erdmann, Fortlage (whose account is remarkably good), Michelet, Biedermann, and others. Dr. William Smith has translated many of the later and more popular writings, and has contributed a very excellent biography of Fichte (*Popular Writings of Fichte, with Memoir*, new edition 1871); Krœger has translated the best portions of the *Wissenschaftslehre* (Science of Knowledge, Philadelphia, 1868) and the *Naturrecht* (Science of Rights, 1870). Several other pieces have been translated in the St. Louis *Journal of Speculative Philosophy*. (R. AD.)

FICHTELGEBIRGE, a mountain group of Bavaria, Germany, forming the centre from which three extensive mountain ranges proceed,—the Erzgebirge in a N.E., the Frankenwalde in a N.W., and the Böhmerwald in a S.E. direction. The streams to which it gives rise flow towards the four cardinal points,—*e. g.*, the Eger eastward and the Saale northward, both to the Elbe; the Main westward to the Rhine, and the Naab southward to the Danube. The chief points of the mass are the Schneeberg and the Ochsenkopf, the former having a height of 3490, and the latter of 3340 feet. The whole district is pretty thickly populated, and there is great abundance of wood, as well as of iron, vitriol, sulphur, copper, lead, and many kinds of marble. In some of the streams mother-of-pearl is found. The inhabitants are employed chiefly in the iron mines, at forges and blast-furnaces, and in charcoal burning and the manufacture of blacking from firewood. The Fichtelgebirge are not much visited by strangers, the only important points of interest being Alexandersbad (a delightfully situated watering-place) and the sandstone labyrinth of Luisenburg.

FICINO, MARSILIO (1433–1499), was born at Figline, in the upper Arno valley, in the year 1433. His father, a physician of some eminence, settled in Florence, and attached himself to the person of Cosimo de' Medici. Here the young Marsilio received his elementary education in grammar and Latin literature at the high school or studio pubblico. While still a boy, he showed promise of rare literary gifts, and distinguished himself by his facility in the acquisition of knowledge. Not only literature, but the physical sciences, as then taught, had a charm for him; and he is said to have made considerable progress in medicine under the tuition of his father. He was of a tranquil temperament, sensitive to music and poetry, and debarred by weak health from joining in the more active pleasures of his fellow-students. When he had attained the age of eighteen or nineteen years, Cosimo received him into his household, and determined to make use of his rare disposition for scholarship in the development of a long-cherished project. During the session of the council for the union of the Greek and Latin churches at Florence in 1439, Cosimo had made acquaintance with Gemistos Plethon, the Neo-Platonic sage of Mistra, whose discourses upon Plato and the Alexandrian mystics so fascinated the learned society of Florence that they named him the second Plato. It had been the dream of this man's whole life to supersede both forms of Christianity by a semi-pagan theosophy deduced from the writings of the later Pythagoreans and Platonists. When, therefore, he perceived the impression he had made upon the first citizen of Florence, Gemistos suggested that the capital of modern culture would be a fit place for the resuscitation of the once so famous Academy of Athens. Cosimo took this hint. The second half of the 15th century was destined to be the age of Academies in Italy, and the regnant passion for antiquity satisfied itself with any imitation, however grotesque, of Greek or Roman institutions. In order to found his new Academy upon a firm basis Cosimo resolved not only to assemble men of letters for the purpose of Platonic disputation at certain regular intervals, but also to appoint a hierophant and official expositor of Platonic doctrine. He hoped by these means to give a certain stability to his projected institution, and to avoid the superficiality of mere enthusiasm. The plan was good; and with the rare instinct for character which distinguished him, he made choice of the right man for his purpose in the young Marsilio.

Before he had begun to learn Greek, Marsilio entered upon the task of studying and elucidating Plato. It is known that at this early period of his life, while he was yet a novice, he wrote voluminous treatises on the great philosopher, which he afterwards, however, gave to the flames. In the year 1459 John Argyropoulos was lecturing on the Greek language and literature at Florence, and Marsilio became his pupil. He was then about twenty-three years of age. Seven years later he felt himself a sufficiently ripe Greek scholar to begin the translation of Plato, by which his name is famous in the history of scholarship, and which is still the best translation of that author Italy can boast. The MSS. on which he worked were supplied by his patron Cosimo de' Medici and by Amerigo Benci. While the translation was still in progress

Ficino from time to time submitted its pages to the scholars, Angelo Poliziano, Cristoforo Landino, Demetrios Chalchondylas, and others; and since these men were all members of the Platonic Academy, there can be no doubt that the discussions raised upon the text and Latin version greatly served to promote the purpose of Cosimo's foundation. At last the book appeared in 1482, the expenses of the press being defrayed by the noble Florentine, Filippo Valori. About the same time Marsilio completed and published his treatise on the Platonic doctrine of immortality (*Theologia Platonica de Immortalitate Animæ*), the work by which his claims to take rank as a philosopher must be estimated. This was shortly followed by the translation of Plotinus into Latin, and by a voluminous commentary, the former finished in 1486, the latter in 1491, and both published at the cost of Lorenzo de' Medici just one month after his death. As a supplement to these labors in the field of Platonic and Alexandrian philosophy, Marsilio next devoted his energies to the translation of Dionysius the Areopagite, whose work on the celestial hierarchy, though recognized as spurious by the Neapolitan humanist, Lorenzo Valla, had supreme attraction for the mystic and uncritical intellect of Ficino.

It is not easy to value the services of Marsilio Ficino at their proper worth. As a philosopher, he can advance no claim to originality, his laborious treatise on Platonic theology being little better than a mass of ill-digested erudition. As a scholar, he failed to recognize the distinctions between different periods of antiquity and various schools of thought. As an exponent of Plato, he suffered from the fatal error of confounding Plato with the later Platonists. It is true that in this respect he did not differ widely from the mass of his contemporaries. Lorenzo Valla and Angelo Poliziano, almost alone among the scholars of that age, showed a true critical perception. For the rest, it was enough that an author should be ancient to secure their admiration. The whole of antiquity seemed precious in the eyes of its discoverers; and even a thinker so acute as Pico di Mirandola, dreamed of the possibility of extracting the essence of philosophical truth by indiscriminate collation of the most divergent doctrines. Ficino was, moreover, a firm believer in planetary influences. He could not separate his philosophical from his astrological studies, and caught eagerly at any fragment of antiquity which seemed to support his cherished delusions. It may here be incidentally mentioned that this superstition brought him into trouble with the Roman church. In 1489 he was accused of magic before Pope Innocent VIII., and had to secure the good offices of Francesco Soderini, Ermolao Barbaro, and the archbishop Rinaldo Orsini, in order to purge himself of a most perilous imputation. What Ficino achieved of really solid, was his translation. The value of that work cannot be denied; the impulse which it gave to Platonic studies in Italy, and through them to the formation of the new philosophy in Europe, is indisputable. Ficino differed from the majority of his contemporaries in this that, while he felt the influence of antiquity no less strongly than they did, he never lost his faith in Christianity, or contaminated his morals by contact with paganism. For him, as for Petrarch, St. Augustin was the model of a Christian student. The cardinal point of his doctrine was the identity of religion and philosophy. He held that philosophy consists in the study of truth and wisdom, and that God alone is truth and wisdom,—so that philosophy is but religion, and true religion is genuine philosophy. Religion, indeed, is common to all men, but its pure form is that revealed through Christ; and the teaching of Christ is sufficient to a man in all circumstances of life. Yet it cannot be expected that every man should accept the faith without reasoning; and here Ficino found a place for Platonism. He maintained that the Platonic doctrine was providentially made to harmonize with Christianity, in order that by its means speculative intellects might be led to Christ. The transition from this point of view to an almost superstitious adoration of Plato was natural; and Ficino, we know, joined in the hymns and celebrations with which the Florentine Academy honored their great master on the day of his birth and death. Those famous festivals in which Lorenzo de' Medici delighted had indeed a pagan tone appropriate to the sentiment of the Renaissance; nor were all the worshippers of the Athenian sage so true to Christianity as his devoted student.

Of Ficino's personal life there is but little to be said. In order that he might have leisure for uninterrupted study, Cosimo de' Medici gave him a house near S. Maria Nuova in Florence, and a little farm at Montevecchio, not far from the villa of Careggi. Ficino, like nearly all the scholars of that age in Italy, delighted in country life. At Montevecchio he lived contentedly among his books, in the neighborhood of his two friends, Pico at Querceto, and Poliziano at Fiesole, cheering his solitude by playing on the lute, and corresponding with the most illustrious men of Italy. His letters, extending over the years 1474–1494, have been published, both separately and in his collected works. From these it may be gathered that nearly every living scholar of note was included in the list of his friends, and that the subjects which interested him were by no means confined to his Platonic studies. As instances of his close intimacy with illustrious Florentine families, it may be mentioned that he held the young Francesco Guicciardini at the font; and that he helped to cast the horoscope of the Casa Strozzi in the Via Tornabuoni.

At the age of forty Ficino took orders, and was honored with a canonry of S. Lorenzo. He was henceforth assiduous in the performance of his duties, preaching in his cure of Novoli, and also in the cathedral and the church of the Angeli at Florence. He used to say that no man was better than a good priest, and none worse than a bad one. His life corresponded in all points to his principles. It was the life of a sincere Christian, and a real sage,—of one who found the best fruits of philosophy in the practice of the Christian virtues. A more amiable and a more harmless man never lived; and this was much in that age of discordant passions and lawless license. In spite of his weak health, he was indefatigably industrious. His tastes were of the simplest; and while scholars like Filelfo were intent on extracting money from their patrons by flattery and threats, he remained so poor that he owed the publication of all his many works to private munificence. For his old patrons of the house of Medici Ficino always cherished sentiments of the liveliest gratitude. Cosimo he called his second father, saying that Ficino had given him life, but Cosimo new birth,—the one had devoted him to Galen, the other to the divine Plato,—the one was physician of the body, the other of the soul. With Lorenzo he lived on terms of familiar, affectionate, almost parental intimacy. He had seen the young prince grow up in the palace of the Via Larga, and had helped in the development of his rare intellect. In later years he did not shrink from uttering a word of warning and advice, when he thought that the master of the Florentine republic was too much inclined to yield to pleasure. A characteristic proof of his attachment to the house of Medici was furnished by a yearly custom which he practised at his farm at Montevecchio. He used to invite the contadini who had served Cosimo to a banquet on the day of Sts. Cosimo and Damiano (the patron saints of the Medici), and entertained them with music and singing. This affection was amply returned. Cosimo employed almost the last hours of his life in listening to Ficino's reading of a treatise on the highest good; while Lorenzo, in a poem on true happiness, described him as the mirror of the world, the nursling of sacred muses, the harmonizer of wisdom and beauty in complete accord. Ficino died at Florence in 1499.

Besides the works already noticed, Ficino composed a treatise on the Christian religion, which was first given to the world in 1476, a translation into Italian of Dante's *De Monarchia*, a life of Plato, and numerous essays on ethical and semi-philosophical subjects. Vigor of reasoning and originality of view were not his characteristics as a writer; nor will the student who has raked these dust heaps of miscellaneous learning and old-fashioned mysticism discover more than a few sentences of genuine enthusiasm and simple-hearted aspiration to repay his trouble and reward his patience. Only in familiar letters, prolegomena, and prefaces do we find the man Ficino, and learn to know his thoughts and sentiments unclouded by a mist of citations; these minor compositions have therefore a certain permanent value, and will continually be studied for the light they throw upon the learned circle gathered round Lorenzo in the golden age of humanism.

The student may be referred for further information to the following works:—*Marsilii Ficini Opera*, Basileæ, 1576; *Marsilii Ficini Vita*, auctore Corsio, ed. Bandini, Pisa, 1771; Roscoe's *Life of Lorenzo de' Medici*; Pasquale Villari, *La Storia di Girolamo Savonarola*, Firenze, Le Monnier, 1859; Von Reumont, *Lorenzo de' Medici*, Leipsic, 1874. (J. A. S.)

FICTIONS, in law, or legal fictions, are false averments, the truth of which is not permitted to be called in question. English law as well as Roman law abounds in fictions. Sometimes they are merely the condensed expression of a rule of law,—*e.g.*, the fiction of English law that husband and wife are one person, and the fiction of Roman law that the wife is the daughter of the husband. Sometimes they must be regarded as reasons invented in order to justify a rule of law according to an implied ethical standard. Of this sort seems to be the fiction or presumption that every one knows the law, which reconciles the rule that ignorance is no excuse for crime with the moral commonplace that it is unfair to punish a man for violating a law of whose existence he was unaware. Again, some fictions are deliberate falsehoods, adopted as true for the purpose of establishing a remedy not otherwise attainable. Of this sort are the numerous fictions of English law by which the different courts obtained jurisdiction in private business, removed inconvenient restrictions in the law relating to land, etc.

What to the scientific jurist is a stumbling-block is to the older writers on English law a beautiful device for reconciling the strict letter of the law with common sense and justice. Blackstone, in noticing the well-known fiction by which the Court of Queen's Bench established its jurisdiction in common pleas (viz., that the defendant was in custody of the marshal of the court), says, "These fictions of law, though at first they may startle the student, he will find upon further consideration to be highly beneficial and useful; especially as this maxim is ever invariably observed, that no fiction shall extend to work an injury; its proper operation being to prevent a mischief or remedy an inconvenience that might result from the general rule of law. So true it is that *in fictione juris semper subsistit æquitas*." Austin, on the other hand, while correctly assigning as the cause of many fictions the desire to combine the necessary reform with some show of respect for the abrogated law, makes the following harsh criticism as to others:—"Why the plain meanings which I have now stated should be obscured by the fictions to which I have just adverted I cannot conjecture. A wish on the part of the authors of the fictions to render the law as *uncognoscible* as may be is probably the cause which Mr. Bentham would assign. I judge not, I confess, so uncharitably; I rather impute such fictions to the sheer imbecility (or, if you will, to the active and sportive fancies) of their grave and venerable authors, than to any deliberate design, good or evil." Bentham, of course, saw in fictions the instrument by which the great object of his abhorrence, *judiciary law*, was produced. It was the means by which judges usurped the functions of legislators. "A fiction of law," he says, "may be defined as a wilful falsehood, having for its object the stealing legislative powers by and for hands which could not or durst not openly claim it, and but for the delusion thus produced could not exercise it." A partnership, he says, was formed between the kings and the judges against the interests of the people. "Monarchs found force; lawyers fraud; thus was the capital found" (*Historical Preface to the second edition of the Fragment on Government*).[1]

Sir H. Maine (*Ancient Law*) supplies the historical element which is always lacking in the explanations of Austin and Bentham. Fictions form one of the agencies by which, in progressive societies, positive law is brought into harmony with public opinion. The others are equity and statutes. Fictions in this sense include, not merely the obvious falsities of the English and Roman systems, but any assumption which conceals a change of law by retaining the old formula after the change has been made. It thus includes both the case law of the English and the *Responsa Prudentum* of the Romans. "At a particular stage of social progress they are invaluable expedients for overcoming the rigidity of law; and, indeed, without one of them, the fiction of adoption, which permits the family tie to be artificially created, it is difficult to understand how society would ever have escaped from its swaddling clothes, and taken its first steps towards civilization."

The bolder remedial fictions of English law have been to a large extent removed by legislation, and one great obstacle to any reconstruction of the legal system has thus been partially removed. Where the real remedy stood in glaring contrast to the nominal rule, it has been openly ratified by statute. In ejectment cases the mysterious sham litigants have disappeared. The bond of entail can be broken without having recourse to the collusive proceedings of fine and recovery. Fictions have been almost entirely banished from the procedure of the courts. The action for damages on account of seduction, which is still nominally an action by the father for loss of his daughter's services, is perhaps the only fictitious action now remaining.

Fictions which appear in the form of principles (like that of the unity of husband and wife) are not so easily dealt with by legislation. To expel them formally from the system would require the re-enactment of vast portions of law. A change in legal modes of speech and thought would be more effective. The legal mind instinctively seizes upon concrete aids to abstract reasoning. Many hard and revolting fictions must have begun their career as metaphors. In some cases the history of the change may still almost be traced. The conception that a man-of-war is a floating island, or that an ambassador's house is beyond the territorial limits of the country in which he resides, was originally a figure of speech designed to set a rule of law in a striking light. It is then gravely accepted as true in fact, and other rules of law are deduced from it. Its beginning is to be compared with such phrases as "an Englishman's house is his castle," which have had no legal offshoots, and still remain mere figures of speech.

Constitutional law is of course honeycombed with fictions. Here there is hardly ever anything like direct legislative change, and yet real change is incessant. The rules defining the sovereign power and fixing the authority of its various members are in most points the same as they were at the last revolution,—in many points they have been the same since the beginning of parliamentary government. But they have long ceased to be true in fact; and it would hardly be too much to say that the entire series of formal propositions called the constitution is merely a series of fictions. The legal attributes of the king, and even of the House of Lords, are fictions. If we could suppose that the effects of the two Reform Acts had been brought about, not by legislation, but by the decisions of law courts and the practice of House of Commons committees—by such assumptions as that freeholder includes lease-holder, and that ten means twenty—we should have in the legal constitution of the House of Commons the same kind of fictions that we find in the legal statement of the attributes of the crown and the House of Lords. Here, too, fictions have been largely resorted to for the purpose of supporting particular theories,—popular or monarchical,—and such have flourished even more vigorously than purely legal fictions. (E. R.)

FIDENÆ, identified with the modern CASTELLO GIUBILEO, an old and important Latin city on the left bank of the Tiber, about five miles above Rome. It is said by Livy to have owed its origin to the Etruscans; but his testimony is not supported by any other historian. There is no Latin city which plays so important a part in the annals of regal Rome. According to the tradition of the Roman historians, hostilities first broke out between the two cities in the time of Romulus, and continued with little intermission and various success till 496 B.C., when, being abandoned by its allies, it was forced to yield to the Roman arms. In 438 B.C. the Fidenates revolted and slew the Roman ambassadors, but after maintaining for twelve years an unequal contest, their city was taken and plundered, and themselves sold into slavery. From this time Fidenæ almost disappears. In the later period of the republic, and under the empire, it was a small country village, and it is mentioned by Horace as almost proverbially desolate. In the reign of Tiberius it acquired a dismal notoriety: an extraordinary gladiatorial show had attracted vast multitudes from Rome and the surrounding country, and the wooden amphitheatre in which they were accommodated fell during the exhibition, and destroyed, it is said, nearly 50,000 persons. No ruins of Fidenæ now exist.

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[1] In the same essay Bentham notices the comparative rarity of fictions in Scotch law. As to fiction in particular, compared with the work done by it in English law, the use made of it by the Scotch is next to nothing. No need have they had of any such clumsy instrument. They have two others "of their own making, by which things of the same sort have been done with much less trouble. *Nobile officium* gives them the creative power of legislation; this and the word desuetude together the annihilative." And he notices aptly enough that, while the English lawyers declared that James II. had abdicated the throne (which everybody knew to be false), the Scotch lawyers boldly said he had forfeited it.

FIELD, JOHN (1782–1837), one of the most remarkable pianists of his time, and of the few composers of British origin whose works have acquired European reputation, was born at Dublin in 1782. He was descended from a musical family, his father being a violinist, and his grandfather the organist in one of the churches of Dublin. From the latter the boy received his first musical education. When a few years later the family settled in London, Field became the favorite pupil of the celebrated Clementi, whom he accompanied to Paris, and later, in 1802, on his great concert tour through France, Germany, and Russia. Under the auspices of his master Field appeared in public in most of the great European capitals, especially in St. Petersburg, and in that city he remained when Clementi returned to England. During his stay with the great pianist Field had to suffer many privations, owing to Clementi's all but unexampled parsimony; but when the latter left Russia his splendid connection amongst the highest circles of the capital became Field's inheritance. Fame and wealth were now within his grasp, but owing to his extravagant and dissipated way of life the composer was never free from care; and to the same cause his early end must no doubt be attributed. His marriage with a French lady of the name of Charpentier was anything but happy, and had soon to be dissolved. Field made frequent concert tours to the chief cities of Russia, and in 1820 settled permanently in Moscow. In 1831 he came to England for a short time, and for the next four years led a migratory life in France, Germany, and Italy, exciting the admiration of amateurs wherever he appeared in public. In Naples he fell seriously ill, and lay several months in the hospital, till a Russian family discovered him and brought him back to Moscow. There he lingered for several years till his death on January 11, 1837. Field was not a prolific writer, but he has left many works which will not easily be forgotten. His training and the cast of his genius were not of a kind to enable him to excel in the larger forms of instrumental music, and of his seven concerti for the pianoforte few, if any, are heard in concert-rooms now-a-days. Neither do his quartets for strings and pianoforte hold their own by the side of those of the great masters. But in the minor forms of composition he has shown gifts surpassed by few of his contemporaries. Especially his "nocturnes," a form of music highly developed, if not actually created by him, remain all but unrivalled for their tenderness and dreaminess of conception, combined with a continuous flow of beautiful melody. But their best claim to immortality is the fact that they have been the models of Chopin's still higher efforts in the same direction. Field's execution on the pianoforte was nearly allied to the nature of his compositions, beauty and poetical charm of touch being mentioned by contemporaries as one of the chief characteristics of his style. A certain monotony was the almost necessary complement of these qualities. Moscheles, who heard Field in 1831, speaks of his "enchanting legato." "I again," he writes on another occasion, "admired his tenderness and elegance and his beautiful touch; but he wants spirit and accent, light and shade, and intensity of feeling."

FIELD, NATHAN, a dramatist and actor of the time of Elizabeth, was probably born about, but not later than, 1587. He was the son of the rector of Cripplegate, the Rev. John Field, and early became one of the children of Queen Elizabeth's chapel, and in 1600 he played one of the principal parts in Ben Jonson's *Cynthia's Revels*, which was acted by children. Next year he played in the *Poetaster*, in 1607 in *Bussey d'Ambois*, and in 1608 in *Epicene*, on which occasion his is the only name among the "children" of 1600 which still remains. In 1612, when he must have been very young, he brought out his first play, the original comedy of *A Woman is a Weathercock*, in which the inconstancy of woman is made a theme fertile in humor. In 1613 he was engaged with Daborne in writing a play which has not been handed down to us; and soon afterwards we find these two authors, in conjunction with Massinger, praying Henslowe for a small sum of money to free them from imprisonment. In 1618 Field printed *Amends for Ladies*, in which he reversed the judgment of his first comedy, and, in the persons of a virtuous maid, wife, and widow, vindicated womankind against himself. It has been supposed that Field had some hand in editing the first folio Shakespeare in 1623; he certainly assisted Massinger in that year in composing his tragedy of *The Fatal Dowry*, and the play bears evident traces of his co-operation. In 1639 he reprinted the *Amends for Ladies*, and in 1641 he was dead. There exists a portrait of Field in Dulwich College. He was the poetic "son" of George Chapman, and the associate of many dramatic poets of that age. His elder brother Theophilus, also a writer of verse, entered the church, and rose to be bishop of Llandaff and afterwards of Hereford. The two unassisted plays of Nathan Field are comedies of contemporary London life, and are mainly written in very smooth and flowing blank verse. They contain one or two lyrics, which, in conjunction with certain passages in *The Fatal Dowry*, prove Field to have surpassed Massinger in lyrical power. *Amends for Ladies* is greatly superior to its companion play in animation, plausibility, and humor; but the passages between Scudmore and Bellafront in *A Woman is a Weathercock* perhaps display the serious style of Field at its best. His song "Rise, lady mistress, rise," in *Amends for Ladies*, is a charming aubade. It is to be regretted that we possess so little of the work of this bright and sensible writer. His plays have never been collected.

FIELDFARE, Anglo-Saxon *Fealo-for* (=Fallow-farer), a large species of Thrush, the *Turdus pilaris* of Linnæus—well known as a regular and common autumnal visitor throughout the British Islands and a great part of Europe, besides Western Asia, and even reaching Northern Africa. It is the *Veldjakker* and *Veld-lyster* of the Dutch, the *Wachholderdrossel* and *Kramtsvogel* of Germans, the *Litorne* of the French, and the *Cesena* of Italians. This bird is of all Thrushes the most gregarious in habit, not only migrating in large bands and keeping in flocks during the winter, but even commonly breeding in society—200 nests or more having been seen within a very small space. The birch-forests of Norway, Sweden, and Russia are its chief resorts in summer, but it is known also to breed sparingly in some districts of Germany. Though its nest has been many times reported to have been found in Scotland, there is perhaps no record of such an incident that is not open to doubt; and unquestionably the Mistletoe-Thrush (*T. viscivorus*) has been often mistaken for the Fieldfare by indifferent observers. The head, neck, upper part of the back, and the rump are gray; the wings, wing-coverts, and middle of the back are rich hazel-brown; the throat is ochraceous, and the breast reddish-brown—both being streaked or spotted with black, while the belly and lower wing-coverts are white, and the legs and toes very dark brown. The nest and eggs resemble those of the Blackbird (*T. merula*), but the former is usually built high up in a tree. The Fieldfare's call-note is harsh and loud, sounding like *t'chat-t'chat:* its song is low, twittering, and poor. It usually arrives in Britain about the middle or end of October, but sometimes earlier, and often remains till the middle of May before departing for its northern breeding-places. In hard weather it throngs to the berry-bearing bushes which then afford it sustenance, but in open winters the flocks spread over the fields in search of animal food—worms, slugs, and the larvæ of insects. In very severe seasons it will altogether leave the country, and then return for a shorter or longer time as spring approaches. From the author of *William of Palerne* to the writers of our own day the Fieldfare has occasionally been noticed by British poets with varying propriety. Thus Chaucer's association of its name with frost is as happy as true, while Scott was more than unlucky in his well-known reference to its "lowly nest" in the Highlands.

Structurally very like the Fieldfare, but differing greatly in many other respects, is the bird known in North America as the "Robin"—its ruddy breast and familiar habits reminding the early British settlers in the New World of the household favorite of their former homes. This bird, the *Turdus migrotorius* of Linnæus, has a wide geographical range, extending from the Atlantic to the Pacific, and from Greenland to Guatemala, and, except at its extreme limits, is almost everywhere a very abundant species.[1] As its scientific name imports, it is essentially a migrant, and gathers in flocks to pass the winter in the south, though a few remain in New England throughout the year. Yet its social instincts point rather in the direction of man than of its own kind, and it is not known to breed in companies, while it affects the homesteads, villages, and even the parks and gardens of the large cities, where its fine song, its attractive plumage, and its great services as a destroyer of noxious insects, combine to make it justly popular. (A. N.)

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[1] It is recorded as having occurred a few times in Europe and once even in England (*Zool.*, 1877, p. 14); but whether in any case it has been a voluntary visitor may be regarded as doubtful.

FIELDING, ANTHONY VANDYKE COPLEY (1787–1855), commonly called Copley Fielding, an English landscape-painter, became at an early age a pupil of John Varley. He took to the water-color method of art, and to this he confined himself almost exclusively. In 1810 he became an associate exhibitor in the Water-color Society, in 1813 a full member, and in 1831 president of that body. He also engaged largely in teaching the art. His death took place at Worthing in March, 1855. Fielding was a painter of much elegance, taste, and accomplishment, without reaching very high in originality of purpose or of style: he painted all sorts of views, including marine subjects in large proportion. Five specimens of his work are to be seen in the water-color gallery of the South Kensington Museum, of dates ranging from 1829 to 1850. Among the engraved specimens of his art is the *Annual of British Landscape Scenery*, published in 1839.

FIELDING HENRY (1707–1754). The pedigree of Fielding the novelist will always be remembered by an eloquent passage in one of Gibbon's essays. "Our immortal Fielding was of the younger branch of the earls of Denbigh, who drew their origin from the counts of Hapsburg, the lineal descendants of Eltrico, in the 7th century duke of Alsace. Far different have been the fortunes of the English and German divisions of the family of Hapsburg: the former, the knights and sheriffs of Leicestershire, have slowly risen to the dignity of a peerage; the latter, the emperors of Germany and kings of Spain, have threatened the liberties of the Old, and invaded the treasures of the New World. The successors of Charles V. may disdain their brethren in England; but the romance of *Tom Jones*—that exquisite picture of humor and manners—will outlive the palace of the Escurial and the imperial eagle of Austria."

Henry Fielding was born at Sharpham Park, near Glastonbury, Somersetshire, on the 22d of April, 1707. There was nothing in the circumstances of his birth to foreshow that the descendant of such illustrious ancestors would drift as rapidly as he did into Bohemia. His father, the youngest son of the earl of Desmond, and grandson of the first earl of Denbigh, is said to have distinguished himself as an officer under Marlborough, though the details of his career are not known. Shortly after the battle of Ramillies, he appears settled in England as a country squire, having married the daughter of Sir Henry Gould, a judge of the King's Bench. As Captain Fielding's family grew, and his love of profuse hospitality manifested itself, and when, on the death of his first wife, he married a second time, and this marriage also proved fertile, it became apparent that his eldest son, the future novelist, would have little patrimony but his wits. His book education had been conducted so far in the ordinary way; he had been taught at home by the family chaplain (said to be the original of Parson Trulliber), and in due course was sent to Eton. But he did not proceed to Oxford with his schoolfellows Lyttelton and Pitt, but, probably from the growing needs for economy at home, was despatched to the university of Leyden.

As we know only the barest leading facts about that interesting seminal period, the first twenty years, of Fielding's life, we can hardly venture even a guess at the circumstances which had given such early encouragement to the bent of his genius that he returned from Leyden after two years' residence there, bringing with him as the chief fruit of his studies a first sketch of a comedy called *Don Quixote in England*. The most significant incident in the records of his early life is his friendship with the studious, ambitious, precocious Lyttelton, a friendship which cannot have been without a powerful influence on an impressionable boy, whose high animal spirits and keen relish for existence did not predispose him to study. In after years the novelist made a point of displaying, with a certain degree of ostentation, the solid learning which he then acquired, and with all his rollicking dash and recklessness devoted himself to severe intellectual labor with a zeal which we never find in those who have spent an idle youth. There is no genius so easily dissipated and diverted from the creation of imperishable works as that of humor; and it is a fair conjecture that the abundant gifts of the "prose Homer" received direction and stimulus from his friend's example as well as his father's impecuniosity. He had no talent for the versification in which Lyttelton delighted and attained such success as to find a place among Johnson's Poets; the only distinction he achieved in that line was the mention of his name by Swift as an unapproachable master of the art of sinking. We can conceive that Fielding's sympathy with his friend's pretty pastoral fancies and glowing heroics was not invariably earnest; still his thoughts had been turned towards literature and learning, while his genius was left free to discover its own natural path.

If his father had been able to pay him his nominal allowance of £200 a year when he returned from Leyden, in all likelihood Fielding would have qualified himself for admission to the bar, and the wit which has become a possession for all time would have spent itself for the entertainment of the law-courts. But, as he says himself of his allowance, "anybody might pay it who would;" and meantime he resolved to put money in his purse by writing for the stage. He submitted his sketch of *Don Quixote in England* to Booth and Cibber, but both, he tells us, "dissuaded him from suffering it to be represented." He rewrote it afterwards when his services were in request, and, conceiving the idea of making the Knight stand for a borough, added some election scenes which greatly increased its value as an acting play. Meantime, he set himself with ready versatility to provide a comedy in the manner of Congreve. His first effort, entitled *Love in Several Masques*, was produced at Drury Lane in February, 1728, and when the author printed it with a dedication to his kinswoman Lady Mary Wortley Montague, he was able to boast that though it succeeded one of the most successful comedies of the time, the *Provoked Husband*, and was "contemporary with an entertainment which engrossed the whole talk and admiration of the town," it had no small measure of success. For ten years from this date Fielding was an established and prolific play-writer, as will be seen from the following catalogue:—*The Temple Beau*, a comedy, 1730; *The Author's Farce*, 1730; *The Coffee-House Politician*, a comedy, 1730; *Tom Thumb the Great*, a burlesque, 1730; *The Letter Writers*, a farce, 1731; *The Grub Street Opera*, a burlesque, 1731; *The Lottery*, a farce, 1731; *The Modern Husband*, a comedy, 1732; *The Covent Garden Tragedy*, a burlesque, 1732; *The Debauchee*, a comedy, 1732; *The Mock Doctor* (adaptation of Molière's *Le Médecin malgre lui*), 1732; *The Miser* (adaptation of *L'Avare*), 1733; *Deborah, or a Wife for you all*, an afterpiece, 1733; *The Intriguing Chambermaid*, a two-act comedy, 1733; *Don Quixote in England*, a comedy, 1734; *An Old Man taught Wisdom*, a farce, 1735; *The Universal Gallant*, a comedy, 1735; *Pasquin*, a dramatic satire, 1736; *The Historical Register*, 1737; *Eurydice*, a farce, 1737; *Eurydice Hissed*, 1737; *Tumble-down Dick*, an extravaganza, 1737; *Miss Lucy in Town*, a farce, 1742; *The Wedding-Day*, a comedy, 1743. And not only did Fielding write plays; he identified himself so closely with the stage as to become a manager. He had a booth at Bartholomew Fair in 1733, in conjunction with Hyppesley the comedian; and in 1736, he took the Haymarket Theatre, and organized a company called "The Great Mogul's Company," a notable incident in the history of the stage, inasmuch as it led to the institution of the dramatic censorship.

None of Fielding's plays, with the exception, perhaps, of his adaptation of the *Miser*, can be said to have "kept the stage;" few even of the students of literature have read them, and those who have read them have dismissed them too hastily. The closest students these plays have ever had were the dramatists of the following generation, whose works, notably those of Sheridan, contain many traces of their assiduity. The tradition about his writing scenes after his return from tavern carousals on the papers in which his tobacco had been wrapt, and his cool reception of Garrick's desire that he should alter some passsage in the *Wedding-Day*, have helped the impression that they were loose, ill-considered, ill-constructed productions, scribbled off hastily to meet passing demands. There is only a fraction of the truth in this notion. That the plays are not the work of a dull plodder or a mechanician of elaborate ingenuity goes without saying; but, though perhaps rapidly considered and rapidly constructed, they are neither ill-considered nor ill-constructed, and bear testimony to the large and keen intelligence, as well as the overflowing humor and fertile wit, of their author. With all Fielding's high spirits, joyous self-confidence, and disdain of criticism, he was no idler over his work; whatever his hand found to do, writing plays, or newspaper articles, or novels, reading law, or administering justice, he did with all his might. He found in play-writing abundant scope for the exercise of that far-sighted and fertile constructive faculty which gave the world afterwards in *Tom Jones* one of the most perfect plots in literature. His plays abound in artfully prepared surprises, and the conclusions are never huddled, confused, and unsatisfactory; he never lacked the skill to unloose the knots which he had had the ingenuity to tie. It may be taken as a national characteristic, whether in the way of merit or defect must be for others to say, that he wrote for the stage as he found it, and practised its methods as he found them, troubling himself little with theories of what it and they ought to be. If we know anything of the actors and actresses who took part in his plays, it is amusing to trace the skill with which he adapted himself to their peculiarities. With regard to his moral tone, it is substantially the same as that which pervades *Tom Jones*. He had no sympathy whatever with the goodness or goodiness of Addison and Steele. His creed is stated in the prologue to the second of his plays, "written by a friend," perhaps the same friend to whom he says he owed the first suggestion of *Tom Jones*, the friend of his school-days, Lord Lyttelton. Some persons, this prologue runs,

"Will argue that the stage
Was meant to improve and not debauch the age.
Pshaw! to improve! the stage was first designed
Such as they are to represent mankind."

If we desire to draw a distinction between Fielding's morality and that of the Restoration dramatists, we should say that he takes more care that the rakes shall not have the best of it.

Very early in his dramatic career Fielding discovered how much of his strength lay in burlesque. The obligations which he professed to owe to Cibber in the preface to his first comedy did not prevent him from turning that versatile writer and his son Theophilus to ridicule very soon afterwards. That Cibber, in the mean time, had offended him by refusing the *Temple Beau*, which was not acted at Drury Lane, or the *Wedding-Day*, which was originally intended for Mrs. Oldfield and Wilkes, is likely enough; if so, the *Author's Farce*, in which a poor play-writer reads a play to the manager and receives his comments upon it, listening all the while to his self-glorification, was an ample revenge. In *Tom Thumb*, a burlesque on inflated tragedy, in which the taste introduced by Dryden and other tragic dramatists of the Restoration period is parodied with irresistible humor, the satire is of a less personal kind, and can be read now with more enjoyment. Fielding, with the consciousness of his aristocratic descent as well as his superior powers, had a large share of Pope's contempt for Grub Street, and was a sort of Ishmael among his play-writing brethren, losing no opportunity of girding at them, and complaining to the public more than once that they had conspired to "damn" his plays. He found, too, another field for his satire in the political corruption of the time. When he returned from Leyden to London, he had solicited the patronage of Sir Robert Walpole, as was the custom of the time, in a copy of verses, but the great minister had paid no heed to them. He was thus left free to indulge his humor. The election scenes in *Don Quixote*, in which he gave a ludicrous representation of the corrupt arts of politicians and the venality of corporations, had made a hit: and when Fielding took the Haymarket Theatre, and assembled a company of unemployed actors, he endeavored to crown this success by a still bolder lampoon on the times. The mock-comedy in *Pasquin* is an election scene, in which he gratifies at the same time his contempt for the performances of rival playwrights and his hatred of political dishonesty. When *Pasquin* was followed up by the *Historical Register*, in which the political transactions for the previous year were freely travestied, the legislature deemed it time to interfere; and after a witty and eloquent protest from the earl of Chesterfield, in which he argued against the measure as an attack upon the property of authors, wit, "too often the only property they have to depend on," a bill was passed to amend the Acts relating to rogues, vagabonds, sturdy beggars, and vagrants, by a provision that every dramatic piece, previous to its representation, should receive the license of the lord chamberlain. Fielding was thus responsible for the institution of the lord chamberlain's censorship of the stage.

It is generally an irksome task to read plays which were written to be acted, and intended to owe no small part of their point to the art of the actors, but the task is considerably lightened in the case of Fielding's plays by the light which they throw on his private history. When he began life in London as a youth of twenty, he had access through his friends and relations to the most brilliant society. Whether he took much advantage of this, in spite of his dislike to "that swarm of impertinences which compose the common-place chat of the world," or whether he succumbed at once to the charms of "low life," with its frank oddities and eccentricities, which his fashionable friends said acquired complete ascendency over him in his later years, we have no means of knowing; but, according to all traditions, he drew from his own case in the character of Luckless in the *Author's Farce*. Luckless is represented as being in a condition which would be pitiable but for the imperturbable cheerfulness and gayety with which he bears it,—attired as a man of fashion but very much in debt, his door almost battered in by duns, winning the heart of his lodging-house-keeper and staying her just claims by his good-humor and wit, seldom dining more than once at the same ordinary, and helped occasionally out of desperate pinches by the generosity of his friends. The colors of the picture are probably somewhat overcharged, but all are agreed as to its substantial truthfulness. We have the authority of his friend Murphy for saying that to the end of his days Fielding was always hard pressed for money; neither his impecuniosity nor his cheerfulness ever deserted him. He had a brief interval of abundance and reckless profusion for two or three years after his marriage with Miss Craddock, a Salisbury "belle," and heiress of £1500. The exact date of his marriage with this lady, who is said to be the original of Amelia, as a former sweetheart and cousin of his, Miss Sarah Andrews, was of Sophia Western, is not known; it took place some time during his play-writing career, probably in 1737, when he was twenty-nine years of age; but whatever may have been the date of the marriage, the youthful husband very soon spent his wife's money. He went, his biographer Murphy tells us, to live in the country, on a small estate which he had inherited from his mother, and at once set about dazzling and outbraving the squires of the neighborhood by setting up a magnificent equipage, dressing a numerous retinue of servants in yellow plush, and dispensing an open-handed hospitality. From this congenial "fling" he was soon compelled to return to his literary drudgery in London, and, it is conjectured, to domestic troubles such as he has depicted in the household of Captain and Mrs. Booth, filled with no high opinion of the intellects and manners of the rural squirearchy, but still unsoured at heart, ready as before to meet all embarrassments with a cheerful face, and to profess himself a disciple of Democritus rather than Heraclitus.

The institution of the lord chamberlain's censorship, and the consequent dispersion of the Great Mogul's company, was a great discouragement to Fielding's play-writing, just as he had hit upon a new and profitable vein. In 1737 he entered as a student of the Middle Temple, and devoted himself with great energy to the study of the law. As a gap of two years occurs at this period in the series of his literary publications, we may probably set this down as the date of his marriage and his experiment at living in the country. Before he had completed his terms, he again had recourse to literary employment, projecting, in conjunction with a journalist of the name of Ralph, a thrice-a-week journal called the *Champion*. It is based on the model of the *Spectator* and the *Tatler*, but in the first number, in which Fielding gives an account of his contributors—different members of the great family of Vinegar—and his purposes, he announces his intention of discussing politics freely as well as literary and social subjects, laying down as his "platform" the reduction of the army, the abolition of useless offices, the restoration of triennial parliaments, and the removal of "that grand anti-constitutional first mover, a prime minister." As the journal went on, these objects did not assume a prominent place; still, the *Champion* is broader in its scope and more rollicking in its tone than the *Spectator*, as might have been expected from the less decorous character of its principal writers. In two volumes of it which were republished in 1741, the work of the different contributors is indicated, and we find among Fielding's essays the germs of many of the disquisitions with which he afterwards adorned his novels. In the *Champion* also he renewed his warfare with Cibber, who had turned upon his witty persecutor and assailed him angrily in his *Apology* as "a broken wit," who, in his "haste to get money," did not scruple to "draw the mob after him," by "raking the channel and pelting their superiors." Fielding's temper was disturbed but not overthrown by this furious onslaught; he retorted merrily by drawing up an account of a trial of the laureate for murder, the murder of his native tongue. At the same time the bitter taunts rankled, and prompted Fielding to many further reprisals. It was significant of Cibber's power of stinging that his enemies could never let him alone.

The next episode in Fielding's life was a serious attempt to get practice at the bar. He was called to the bar in June, 1740, and we are assured by Murphy that he threw himself earnestly into the work, forswore literature, attended Westminster Hall diligently, went circuit; but briefs did not come in, he could not afford to wait, and was compelled, however reluctantly, to return to his old trade.

Fielding returned to literature, but in a new character. A few months after he was called to the bar Richardson's novel *Pamela* was published, and was received with the favor always accorded to whatever is fresh and out of the beaten track. Richardson's novels are somewhat tedious reading now, but their simplicity and close adherence to nature were a new revelation to a public surfeited with the extravagant improbabilities and fictitious heroic manners of the school of romance of which *Parthenissa* was the most illustrious example in English. *Pamela* at once became a book that everybody had to read. Fielding read it, but with less reverence and admiration than the ladies of the time. A man cannot escape from the prevalent moral teaching of his generation; his attitude towards it must be either sympathetic or militant. The prosperous evenly conducted printer had complete sympathy with the worldly ethics of the 18th century; the idea of writing *Pamela* had been put into his head by the suggestion that he should write "a little book of familiar letters on the useful concerns of common life;" and in his earnestness to promote the cause of religion and virtue he saw nothing absurd in making a young maid-servant resist the improper advances of her master and be sustained in her resistance by a secret hope that he might be driven by his passion into offering her lawful marriage. To Fielding, on the other hand, there was something ludicrous in good conduct which was so closely allied to artfulness, and he was moved to write a parody of Mrs. Andrews's virtue and distressing humility in the adventures of Joseph Andrews, who, "by keeping the excellent pattern of his sister's virtues before his eyes," was enabled to preserve his purity in the midst of great temptations. *Joseph Andrews*, published in 1742, was thus in its original conception a parody of *Pamela*, but the author, though he began it with this intention, and executed his intention with inimitable wit, became aware as he went on that he was introducing a kind of writing as new in its way to English readers as *Pamela* itself, and when he issued the work he endeavored in his preface to place it on a higher ground than mere burlesque. There was a wide difference, he said, between the comic and the burlesque,—the burlesque writer striving to exhibit what is monstrous, unnatural, delightfully and surprisingly absurd, while the comic writer confined himself strictly to nature, and was of all writers the last to be excused for deviating from it, because "life everywhere furnishes an accurate observer with the ridiculous." Distinguishing epic writing into the tragic and the comic, and "not scrupling to say" that it might be in prose as well as in verse, Fielding claimed for *Joseph Andrews* the title of a comic prose epic. The author's criticism on his own work has never been surpassed for justness; it is a striking testimony that genius is not always unconscious of its own excellence. He was equally correct in describing the novel as being "written in the manner of Cervantes," for in *Joseph Andrews* there is the same blending of the ludicrous, the admirable, and the pathetic as in the character of the knight of La Mancha. The humble squire, not the knight, was his hero, but he had at last succeeded in the dream of his youth, introducing Don Quixote into England.

It may be assumed that the most irritating thing to Richardson in Fielding's parody was the humorous malice of making Pamela endeavor to dissuade her brother from lowering their family by marrying poor Fanny. This wise advice was too nearly in keeping with the prudent character of Mrs. B. (or, as Fielding filled out the initial, Mrs. Booby); and that a person of low habits should preach a higher, or at least a more spiritual morality than himself, must have been gall and wormwood to the moralist.

Joseph Andrews was almost as great a success as *Pamela*. Fielding had received £200 for it from Andrew Millar, after vainly negotiating with another publisher for £25. The sum was not sufficient to allow him to rest on his oars. His next work, published two months after *Joseph Andrews*, was a pamphlet in defence of "Old Sarah," the duchess of Marlborough. Considering that his father had been a favorite with the duke, and that one of his sisters was named after the duchess, there is no reason to suppose that Fielding's eulogy was venal, whatever consideration he may have received for the service. In May of the same year (1742) his last composition for the stage, *Miss Lucy in Town*, a sequel to an *An Old Man Taught Wisdom*, was produced at Drury Lane; but the enemy whom he had raised up, the lord chamberlain, prohibited the piece, when it had run successfully for several nights, because one of the characters was supposed to be a satire on a person of quality. Early in the following year he was induced to undertake to recast for Garrick his comedy of *The Wedding-Day*, the third comedy he ever wrote, which had been rejected years before by a manager, possibly Cibber. The serious illness of his wife prevented him from recasting the play; produced as it stood, it was a failure. This was the end of Fielding's connection with the stage. In 1743 he published three volumes of Miscellanies, the first volume containing poems, essays, and imaginary dialogues, the second being *A Journey from this World to the Next*, the third *The History of Jonathan Wild the Great*. The conversations between eminent men of the past, which the imaginary traveller overheard in his journey to the shades, are full of the most delicate satiric humor, and bear testimony also to the vividness of Fielding's scholarship. *Jonathan Wild*, in some respects the most powerful of Fielding's works, is the only one in which the satire is dashed with bitterness. The bitterness is not predominant: his irrepressible humor has everywhere got the mastery, and risen to the surface; but the blows aimed at the arts by which men attain fame and fortune are so fierce as to suggest that at no other period in his career had Fielding's troubles so deep a hold of him. At no other time was he so nearly overmastered by the savage feelings of the disappointed man, who sees his inferiors in ability outstripping him in the race by arts which he will not practise. At no other time, indeed, had Fielding such cause for bitterness in the accumulation of every kind of worry and vexation as in the year 1743. The evils of poverty, which were always present with him, were aggravated by the dangerous illness of his wife, to whom he was passionately attached. He was so distracted by anxiety for her safety, and remorse at the thought of being to blame for her discomfort, that he could not proceed with the work on which he depended for the support of his family. His own health was far from being good; he suffered from attacks of gout, brought on by his sedentary habits and his excesses. Meantime the enemies whom he had enraged by his satires were swarming round him with endless devices for his annoyance. No man ever wrote in more desperate and pitiable circumstances. Yet there is no perceptible diminution in the splendid force of his humor. He shook off his troubles like a giant, and gave no sign of the pain at his heart, save in the fiercer energy of his blows. It may well increase our admiration for the genius shown in *Jonathan Wild* to know that the author labored in the face of so deadly a conspiracy to rob his hand of its strength.

In 1743 Mrs. Fielding caught a fever, and died, Lady Mary W. Montague says, in her husband's arms. For two years afterwards he published nothing but a preface to his sister's novel, *David Simple*. Although Sarah Fielding was one of Richardson's favorites, and heard laments from him about her brother's "continued lowness," she seems to have comforted that low brother in his sorrow, and even lived in the same house with him. It was probably at this time that Fielding received from Lord Lyttelton the assistance which he gratefully acknowledges in the dedication of *Tom Jones*. As that masterpiece is said to have been "the labor of some years of his life," we may conjecture that it was begun some time during these otherwise barren years, and that, as *Don Quixote* was written in a prison, *Tom*

Jones was written when its author was only saved from despair and destitution by the tender kindness of two lifelong friends.

In 1745 Fielding made a second successful venture in periodical literature. In November of that year, when London was agitated by the news of the preparations of the Jacobites for marching across the border, he issued the first number of the *True Patriot*, in which he brought all his powers of ridicule and his robust sense to the service of the established Government. He continued the publication of the *True Patriot* till the rebellion was suppressed. More than a year afterwards, in December, 1747, he began another periodical, called *The Jacobite Journal*, the object of which he stated to be "to eradicate those feelings and sentiments which had been already so effectually crushed on the field of Culloden." In both these ventures he was probably assisted by his staunch friend Lyttelton. One of the reasons he gave for starting them was the lamentable ignorance of the common run of journalists, and the greater accuracy of the information at his command, a taunt and boast for which his rivals retaliated by copious personal abuse, and the accusation that he was in the pay of the Government. If Fielding was in the pay of the Government, they made but a poor return for his support when it was no longer required. Soon after the discontinuance of the *Jacobite Journal*, towards the close of 1748, he obtained, again, it is said, through Lyttelton's assistance, the post of a paid Middlesex magistrate. In one of his earliest comedies Fielding had thrown hearty ridicule on these functionaries, who had brought their office into disrepute by their scandalous venality. It was notorious that they eked out their small fees by selling justice to the highest bidder. When Fielding himself accepted such an office his enemies exulted loudly over the step as a degradation. About the same time he gave them another handle for scurrility by marrying his deceased wife's maid. This last act, as Lady Mary Montague said, "was not so discreditable to his character as it may sound." "The maid had few personal charms, but was an excellent creature, devotedly attached to her mistress, and almost broken-hearted for her loss. In the first agonies of his own grief, which approached to frenzy, he found no relief but from weeping along with her, no solace, when a degree calmer, but in talking to her of the angel they mutually regretted. This made her his habitual confidential associate; and in process of time he began to think he could not give his children a tenderer mother, or secure for himself a more faithful housekeeper and nurse. At least this was what he told his friends, and it is certain that her conduct as his wife confirmed it, and fully justified his good opinion."

Fielding's enemies did not scruple to say that in his discharge of his duties as a justice he was no better than his own Justice Thrasher; but there was no foundation for the charge,—it was only a personal retort in the coarse manner of the time. We have, on the contrary, in the zeal with which Fielding applied himself to his work, an instance of that earnest side of his character which is perhaps kept too much in the background in Thackeray's charming lecture on him as a humorist. One of his favorite themes was the preposterousness of undertaking any work without the requisite knowledge, and he showed by his published charge to a grand jury, by pamphlets on various notorious cases, and by an elaborate inquiry into the causes of crime and the most advisable remedies, that he was himself a diligent student of the numerous volumes of the law which he ridiculed Justice Thrasher for neglecting. He was sufficiently sensitive to the spiteful calumnies of his literary antagonists to formally deny, in his *Journal of a Voyage to Lisbon*, that he had been guilty of the corruption with which they charged him, declaring that, "on the contrary, by composing instead of inflaming the quarrels of porters and beggars, and by refusing to take a shilling from a man who most undoubtedly would not have had another left, he had reduced an income of about £500 a year, of the dirtiest money upon earth"—the income of the justice came from fees—"to little more than £300, a considerable portion of which remained with his clerk."

A few months after his appointment to the justiceship, in February, 1749, Fielding published his masterpiece *The History of Tom Jones, a Foundling.* Here we have the ripe fruits of his life. His varied experience supplied his imagination with abundant suggestions of incident. His long struggle with his pen for a livelihood had given elasticity to his style. His mind was full; the hackwork, which would have exhausted poorer energies had mobilized his, and made him perfect master of his resources. Hard minds, like stones, are not enriched by rolling; but Fielding's mind was of the plastic sort, and went on gaining by its incessant movement. His heart, too, had remained as fresh as his brain. His own life had been far from scrupulously pure, but he could still give the world "a miracle of loveliest womanhood" in Sophia Western. His name had been a byword and reproach in respectable circles from his early manhood upwards, but he could still write in deprecation of the cynical philosophy of Mandeville, and create a pattern English gentleman in Squire Allworthy. One would never imagine from reading *Tom Jones* that its author was a man of illustrious family who had treated his titled relations with airy independence, and been left by them to win a livelihood by the exercise of his own wits, unsupported by any of the sinecures which their influence might have placed at his disposal. There was no moralist of the time whose scorn was so heartily and steadily directed against vice, against profligacy, avarice, hypocrisy, meanness in every shape and size; he made war without ceasing on all ungenerous emotions. In breaking with convention, he remained faithful to society. It is a curious circumstance that this true soldier in the war of humanity, like his great exemplar Cervantes, should be more often read for the sake of indelicate passages which he wrote in pursuance of fidelity to nature, than for the generous sentiment and wise philosophy with which his work as a whole is penetrated. But even this posthumous injustice he could have foreseen without ill-nature.

Judging from Richardson's lament over his rival's continued lowness, and the anecdote told by Horace Walpole of his being found "banqueting with a blind man and three Irishmen" when some persons of quality wanted his services as a police magistrate, one might imagine that Fielding spent his leisure off the bench in gratifying his preference for low company. That he enjoyed the frankness and originality of unconventional associates is likely enough; but he has shown that he had more profitable employment for his leisure. In the first two years after he took office, he completed his last novel, *Amelia*. It has always been supposed that, in the relations between the somewhat frail but good-natured Captain Booth and his perfect wife Amelia, Fielding drew in some particulars at least from his own domestic life. Dr. Johnson, who refused to read *Joseph Andrews*, and inferred from *Tom Jones* that Fielding was "a blockhead" and "a barren rascal," owned that he was so taken by *Amelia* as to read it through at a sitting, and mentions as an evidence of its popularity that it was the only instance he knew of the whole of a first edition being sold in one day. Mr. Lawrence has pointed out that this last circumstance was due to the ingenuity of the publisher; still the sale was sufficiently rapid to be a tribute to the popularity of its predecessors from the same pen. A more substantial tribute to the author was the increasing price paid for his labors; he received £600 for *Tom Jones*, and £1000 for *Amelia*. Fielding's editor and biographer, Arthur Murphy, professed to see in *Amelia* signs of a genius falling into decay; but, as in the case of Dickens, the decay does not lie in matters that affect the intellect. *Amelia* is inferior to *Tom Jones* only in so far as its humor is less exuberant; it is even richer in happily turned humorous sayings. But the color of the incidents is more predominantly serious; the laughing philosopher has not changed his mood, but he takes less strong delight in creating materials for laughter.

As soon as *Amelia* was off his hands, Fielding bent himself with unflagging energy to a new enterprise. In January, 1752, he issued the first number of a new periodical, the *Covent Garden Journal*, "by Sir Alexander Drawcansir, Knight, *censor* of Great Britain." In the first number he proved that his appetite for literary warfare was undiminished, giving fair warning to "scribblers" in general that they must expect no mercy; and soon after, he began an exchange of personalities with Dr. John Hill which Disraeli has thought worthy of a place among his quarrels of authors. Among other writers who accepted Fielding's challenge was Smollett, whose ground of quarrel was probably political, but to him Fielding made no reply. He was never an indiscriminate satirist, either in words or in literature; he reserved his lash for what he believed to be bad, and not even provocation could make him attack a man whose writings he respected.

The *Covent Garden Journal* was discontinued towards the end of 1752, partly, it may be supposed, in consequence of Fielding's health making him unable to bear the strain. He had long been a sufferer from gout; he had undermined his naturally robust constitution by hard work and reckless living; and in 1753 his frame began to exhibit symptoms of dropsy. The narrative of the last painful year of his life is given in his *Journal of a Voyage to Lisbon.* At a moment when the disease might have been curable, or at least might have been delayed in its ravages, he was kept in town to carry out a scheme for putting down organized gangs of robbers who were setting the law at defiance. He tried the effect of the waters at Bath; he experimented on himself with Bishop Berkeley's specific of tar-water; he submitted frequently to the operation of tapping; but the summer of 1754 found him with "the dropsy gaining rather than losing ground, the distance growing still shorter between the tappings." In June he set sail for Lisbon to give himself the chance of a milder winter; but the precaution was unavailing. He died at Lisbon on the 8th of October, 1754. To the last, as his *Journal* shows, he preserved his cheerfulness and his mental activity. Besides his *Journal*, he left behind him a fragment of an answer to Lord Bolingbroke's religious and philosophical essays, for which, according to Murphy, he had prepared himself by collecting "long extracts and arguments from the fathers, and the most eminent writers of controversy." "It is a pity," Lady Mary Montague wrote when she heard of his death, "he was not immortal;" he was "so formed for happiness."

An essay on Fielding's life and writings is prefixed to Arthur Murphy's collected edition of his works; and short biographies have been written by Sir Walter Scott and William Roscoe. The most complete biography is Mr. F. Lawrence's, a conscientious and thorough piece of work. (W. M.)

FIERI FACIAS, in English law, is a writ of execution after judgment obtained in action of debt or damages. It is addressed to the sheriff, and commands him to make good the amount out of the goods of the person against whom judgment has been obtained.

FIESCHI, Joseph Marie (1790–1836), assassin, the chief conspirator in the attempt on the life of Louis Philippe in July, 1835, was a native of Murato in Corsica, and was baptized there, December 3, 1790. After following his father's occupation, that of a shepherd, he enlisted at the age of eighteen in the Corsican Legion, at Naples, and passed with it into the service of Murat, king of Naples. In 1814 he returned to Corsica, and in the following year took part in the fatal expedition of Murat for the recovery of his crown. Sentence of death was passed on him and his companions, but it was not executed; and Fieschi once more returned to his native land. In 1816 he was convicted of theft and forgery, and was condemned to imprisonment for ten years. After his release he led for several years a restless miserable life, working only by fits, and eking out his resources by fraud and swindling. He went to Paris after the Revolution of July (1830), and by means of forged papers passed himself off as a victim of the Restoration, and obtained a pension and official employment. He affected a zealous devotion to the Government, entered the police, and displayed much energy in the suppression of disturbances. But meanwhile his house was the scene of violent proceedings, and the neighborhood was kept in alarm by frequent noises, cries, and pistol-shots in and around it. Facts where brought to light which cost him his friends and his employments. Exasperated by dismissal and the "ingratitude of the Government," he vowed a terrible vengeance. He took lodgings on the Boulevard du Temple, and there, with several infamous confederates, contrived his "infernal machine," constructed with twenty gun barrels, to be fired simultaneously. In July, 1835, the fifth anniversary of the Revolution was to be celebrated. Vague rumors getting afloat of some impending catastrophe, of some horrible attempt on the life of the king, prudential measures were taken. On the 28th, as Louis Philippe was holding a grand review, and was passing along the boulevard accompanied by his three sons and a numerous staff, a sudden explosion was heard, followed by others, and the pavement was strewed with dead and wounded men. A ball grazed the king's forehead, and his horse, with those of the duke of Nemours and the prince de Joinville, was shot; but the king and the princes escaped as if by miracle. Fieschi himself was severely wounded by the discharge of his machine, and vainly attempted to escape. The attentions of the most skilful physicians were lavished upon him, and his life was saved for the stroke of justice. On his trial he named his accomplices, displayed much bravado, and expected or pretended to expect ultimate pardon. He was condemned to death, and was guillotined, February 19, 1836, making on the scaffold a premeditated theatrical display at the feet of his confessor. Of his accomplices two were executed, one was sentened to twenty years' imprisonment, and one was acquitted. A full account of the trial, *Procès de Fieschi*, appeared at Paris the same year.

FIESCO [de' Fieschi], Giovanni Luigi (about 1523–1547), count of Lavagna, Genoese conspirator, was descended from a great historical family which counted among its members Popes Innocent IV. and Adrian V. He was born about 1523, and by the death of his father he became at the age of twenty-three the head of his race and the possessor of considerable estates. He had allied himself by marriage with the ancient family of Cibo,—his wife Eleanora, then about twenty years of age, being a woman of high spirit, great beauty, and remarkable attainments. To the advantages of youth and wealth Fiesco added those of a fine figure, a handsome countenance, and fascinating manners. He was ambitious of power and high place, and inherited from his ancestors a strong passion of jealousy and hatred against the Doria family, the head of which, Andrea Doria, was then doge of the republic, while his nephew, the young Gianettino Doria, was commander of the galleys. With personal and family hostility was combined the political enmity between the imperial and French (aristocratic and popular) parties,—the Dorias belonging to the former and being warmly supported by the nobles, while the Fieschi were of the latter and leaned upon the popular class. Bent on the overthrow of the doge and his family, Giovanni Luigi made an attempt to secure the support of Francis I. in his enterprise, but in this he did not at first succeed. The negotiations were afterwards renewed through William du Bellay, then French ambassador in Italy, and an understanding was come to that the object of the proposed revolution should be to subject the republic to the king of France. The sanction of the pope, Paul III., was obtained, and the alliance of the duke of Parma and Placentia secured. Associated with Giovanni Luigi in the conspiracy were his brothers Geronimo and Ottobuoni, and his trusted friends Vincenzo Calcagno, De Varese, and Raffaello Sacco. Troops were levied in the duchy of Parma, and report of these suspicious preparations was sent to Andrea Doria to put him on his guard. But his regard for the young count forbade him to entertain suspicion, and no precautions were taken. When all was ready, Fiesco invited the Dorias to a banquet at his palace on the first day of January, 1547, purposing to assassinate them on their arrival. But the doge declined the invitation, his nephew Gianettino had to leave Genoa for some weeks, and the scheme thus foundered. The next night, however, taking advantage of the unsettled state of the city at the period of re-election of the doge, Fiesco led out his band (having first by display of affectionate attention to Doria thrown him off his guard), seized the arsenal, and attacked the galleys. While passing along a plank from the quay to one of the galleys the leader fell into the sea and was drowned, the darkness and the confusion preventing his cries for help being heard. The other conspirators proceeded with their task, and Gianettino was slain. The doge succeeded in making his escape, and after the dispersion of the troops and the flight of the leaders, he returned to Genoa, and was welcomed with extraordinary honors. Eleanora, wife of Fiesco, escaped to Massa, married again, survived her second husband many years, and died at Florence in 1594. The story of this conspiracy has frequently been told both by historians and by poets. Amongst the prose narratives that of Mascardi (Antwerp, 1629) is commended for accuracy of detail, but is wanting in impartiality. Amongst the poems the most noteworthy is the tragedy of Schiller

FIESOLE, a small episcopal city of Italy, occupying the site of the ancient Fæsulæ, on the crown of a hill that rises above the Arno, about three miles to the west of Florence. In size it is little more than a village, but its historical interest is of considerable scope. The principal building is the cathedral, which was commenced by Bishop Giacomo

Bavaro in 1028, and dedicated to San Pietro Romolo, a martyr under Nero. It is a small basilica, consisting of a nave with narrow aisles, a transept, a raised choir, and a crypt noticeable for the uncommon character of its capitals. Among its adornments are an altarpiece and a bust of Bishop Salutati by Mino di Fiesole. The church of St. Maria Primerana, with a terra-cotta tabernacle by L. della Robbia, San Allesandro, with its twelve cipollino columns, the Franciscan convent, the episcopal palace, and the town-hall or palazzo del pretorio, dating from the 13th century, are all worthy of notice. The convent probably occupies the site of the old *arx* or citadel; behind the cathedral there are extensive remains of a large Roman theatre discovered in 1809 and laid bare in 1872–3; and a few dilapidated portions of the ancient Etruscan fortification still stand on the northern brow of the hill. Between the little city and Florence the church of San Domenico di Fiesole marks the site of the monastery famous as the residence of Fra Angelico (see next article); not far from the church is the villa where Walter Savage Landor dwelt many years amid the scenes of Boccaccio's *Decameron;* and further up the hill is the yet more celebrated Villa Mozzi, the favorite haunt of Lorenzo the Magnificent. The present inhabitants of Fiesole are largely employed in straw plaiting. They number, according to the census of 1871, 3467 in the city, and 13,180 in the commune.

Fæsulæ has a great mythical history, according to which it is the oldest city in the world. Its real origin is unknown, but it was evidently an Etruscan site long before the Roman conquest. It became of some note in the Gallic and Punic wars, and was afterwards selected by Sulla for the settlement of a body of his veterans. Twenty years later these colonists rendered themselves formidable by the support which they gave to Catiline, and the town was chosen as his head-quarters in the struggle against Metellus and Antony. The story of Catiline and his exploits has been developed into an elaborate legend by Malespini and other Fiesolan historians. Catellino, as he is called, wages war against Fiorino, king of Rome; the king is slain, but the Fæsulan party is ultimately defeated by Julius Cæsar, and a new city, Fiorenza Magna (Florence), is founded by the conqueror, and named in honor of Fiorino. At a later date Fæsulæ, continues the story, was rebuilt by Attila, and Florence destroyed. From Procopius we know that the little city, while occupied by Witiges and his Goths, did stand a long siege by the forces of Belisarius. According to the common account it was "destroyed" by the Florentines in the 11th or 12th century; but the statement is open to question, and the destruction at any rate cannot have been very complete. Among the more eminent natives of Fiesole are Francesco Ferrucci, the great captain, and Francesco Ferrucci, the first sculptor in porphyry.

FIESOLE (1387–1455). Il Beato Fra Giovanni Angelico da Fiesole is the name given to a far-famed painter-friar of the Florentine state in the 15th century, the protagonist, beyond all other men, of pietistic painting. He is often but not accurately, termed simply "Fiesole," which is merely the name of the town, noticed above, where he first took the vows; more often, Fra Angelico. If we turn his compound designation into English, it runs thus—"the Beatified Friar John the Angelic of Fiesole." In his lifetime he was known no doubt simply as Fra Giovanni, or Friar John; "the Angelic" is a laudatory term which got assigned to him at an early date,—we find it in use within thirty years after his death; and, at some period which is not defined in our authorities, he was beatified by due ecclesiastical process. His surname was Guido: his original Christian name—Giovanni being only his name in religion—is not known. He was born at Vicchio, in the Tuscan province of Mugello, of unknown but seemingly well-to-do parentage, in 1387 (not 1390, as sometimes stated); in 1407 he became a novice in the convent of S. Domenico at Fiesole, and in 1408 he took the vows and entered the Dominican order. Whether he had previously been a painter by profession is not certain, but may be pronounced probable. The painter named Lorenzo Monaco may have contributed to his art-training, and the influence of the Sienese school is discernible in his work. According to Vasari, the first paintings of this artist were in the Certosa of Florence; none such exist there now. His earliest extant performances, in considerable number marked to some extent by the influence of Masolino, are at Cortona, whither he was sent during his noviciate, and here apparently he spent all the opening years of his monastic life. His first works executed in fresco were probably those, now destroyed, which he painted in the convent of S. Domenico in this city; as a fresco-painter, he may have worked under, or as a follower of, Gherardo Starnina. From 1418 to 1436 he was back at Fiesole; in 1436 he was transferred to the Dominican convent of S. Marco in Florence, and in 1438 undertook to paint the altarpiece for the choir, followed by many other works; he may have studied about this time the renowned frescoes in the Brancacci chapel in the Florentine church of the Carmine, and also the paintings of Orcagna. In or about 1445 he was invited by the pope to Rome. The pope who reigned from 1431 to 1447 was Eugenius IV., and he it was who in 1445 appointed another Dominican friar, a colleague of Angelico, to be archbishop of Florence. If the story (first told by Vasari) is true—that this appointment was made at the suggestion of Angelico only after the archbishopric had been offered to himself, and by him declined on the ground of his inaptitude for so elevated and responsible a station—Eugenius, and not (as stated by Vasari) his successor Nicholas V., must have been the pope who sent the invitation and made the offer to Fra Giovanni, for Nicholas only succeeded in 1447. The whole statement lacks authentication, though in itself credible enough. Certain it is that Angelico was staying in Rome in the first half of 1447; and he painted in the Vatican the Capella del Sacramento, which was afterwards demolished by Paul III. In June, 1447, he proceeded to Orvieto, to paint in the Capella Nuova of the cathedral, with the co-operation of his pupil Benozzo Gozzoli. He afterwards returned to Rome to paint the chapel of Nicholas V. In this capital he died in 1455, and he lies buried in the church of the Minerva.

According to all the accounts which have reached us, few men to whom the distinction of beatification has been conferred could have deserved it more nobly than Fra Giovanni. He led a holy and self-denying life, shunning all advancement, and was a brother to the poor; no man ever saw him angered. He painted with unceasing diligence, treating none but sacred subjects: he never retouched or altered his work, probably with a religious feeling that, such as divine providence allowed the thing to come, such it should remain. He was wont to say that he who illustrates the acts of Christ should be with Christ. It is averred that he never handled a brush without fervent prayer, and he wept when he painted a Crucifixion. The Last Judgment and the Annunciation were two of the subjects he most frequently treated.

Bearing in mind the details already given as to the dates of Fra Giovanni's sojournings in various localities, the reader will be able to trace approximately the sequence of the works which we now proceed to name as among his most important productions. In Florence, in the convent of S. Marco (now converted into a national museum), a series of frescoes, beginning towards 1443. In the first cloister is the Crucifixion, with St. Dominick kneeling; and the same treatment recurs on a wall near the dormitory; in the chapterhouse is a third Crucifixion, with the Virgin swooning, a composition of twenty life-sized figures—the red background, which has a strange and harsh effect, is the misdoing of some restorer; an Annunciation, the figures of about three-fourths of life-size, in a dormitory; in the adjoining passage, the Virgin Enthroned, with four saints; on the wall of a cell, the Coronation of the Virgin, with Saints Paul, Thomas Aquinas, Benedict, Dominick, Francis, and Peter Martyr; two Dominicans welcoming Jesus, habited as a pilgrim; an Adoration of the Magi; the Marys at the Sepulchre. All these works are later than the altarpiece which Angelico painted (as before mentioned) for the choir connected with this convent, and which is now in the academy of Florence; it represents the Virgin with Saints Cosmas and Damian (the patrons of the Medici family), Dominick, Peter, Francis, Mark, John Evangelist, and Stephen: the pediment illustrated the lives of Cosmas and Damian, but it has long been severed from the main subject. In the Uffizi gallery, an altarpiece, the Virgin (life-sized) enthroned, with the Infant and twelve angels. In S. Domenico, Fiesole, a few frescoes, less fine than those in St. Marco; also an altarpiece in tempera of the Virgin and Child between Saints Peter, Thomas Aquinas, Dominick, and Peter Martyr, now much destroyed. The subject which originally formed the predella of this picture has, since 1860, been in the London National Gallery, and worthily represents there the hand of the saintly painter. The subject is a Glory, Christ with the banner of the Resurrection, and a multitude of saints, including, at the extremities, the saints or beati of the Dominican order; here are no fewer than 266 figures, or portions of figures, many of them having names inscribed. This predella was highly lauded by Vasari; still more highly another picture which used to form an altar-piece in Fiesole, and which now obtains world-wide celebrity in the Louvre—the Coronation of the Virgin, with eight predella subjects of the miracles of St. Dominick. For the church of S. Trinita, Florence, Angelico executed a Deposition from the Cross, and for the church of the Angeli a Last Judgment, both now in the Florentine academy; for S. Maria Novella, a Coronation of the Virgin, with a predella in three sections, now in the Uffizi,—this again is one of his masterpieces. In Orvieto cathedral he painted three triangular divisions of the ceiling, portraying respectively Christ in a glory of angels, sixteen saints and prophets, and the virgin and apostles: all these are now much repainted and damaged. In Rome, in the chapel of Nicholas V., the acts of Saints Stephen and Lawrence; also various figures of saints, and on the ceiling the four evangelists. These works of the painter's advanced age, which have suffered somewhat from restorations, show vigor superior to that of his youth, along with a more adequate treatment of the architectural perspectives. Naturally, there are a number of works currently attributed to Angelico, but not really his; for instance, a St. Thomas with the Madonna's girdle, in the Lateran museum, and a Virgin enthroned in the church of S. Girolamo, Fiesole. It has often been said that he commenced and frequently practised as an illuminator; this is dubious, and a presumption arises that illuminations executed by Giovanni's brother Benedetto, also a Dominican, who died in 1448, have been ascribed to the more famous artist. Benedetto may perhaps have assisted Giovanni in the frescoes at S. Marco, but nothing of the kind is distinctly traceable. A folio series of engravings from these paintings was published in Florence in 1852. Along with Gozzoli, already mentioned, Zanobi Strozzi and Gentile da Fabriano are named as pupils of the Beato.

We have spoken of Angelico's art as "pietistic;" this is in fact its predominant character. His visages have an air of rapt suavity, devotional fervency, and beaming esoteric consciousness, which is intensely attractive to some minds, and realizes beyond rivalry a particular ideal —that of ecclesiastical saintliness, and detachment from secular fret and turmoil. It should not be denied that he did not always escape the pitfalls of such a method of treatment, the faces becoming sleek and prim, with a smirk of sexless religiosity which hardly eludes the artificial or even the hypocritical; on other minds, therefore, and these some of the most masculine and resolute, he produces little genuine impression. After allowing for this, Angelico should nevertheless be accepted beyond cavil as an exalted typical painter according to his own range of conceptions, consonant with his monastic calling, unsullied purity of life, and exceeding devoutness. Exquisite as he is in his special mode of execution, he undoubtedly falls far short, not only of his great naturalist contemporaries such as Masaccio and Lippo Lippi, but even of so distant a precursor as Giotto, in all that pertains to bold or life-like invention of a subject, or the realization of ordinary appearances, expressions, and actions—the facts of nature, as distinguished from the aspirations or contemplations of the spirit. Technically speaking, he had much finish and harmony of composition and color, without corresponding mastery of light and shade, and his knowledge of the human frame was restricted. The brilliancy and fair light scale of his tints is constantly remarkable, combined with a free use of gilding; this conduces materially to that celestial character which so pre-eminently distinguishes his pictured visions of the divine persons, the hierarchy of heaven, and the glory of the redeemed. (W. M. R.)

FIFE. See FLUTE.

FIFE, a maritime county of Scotland, is situated between 56° 1′ and 56° 27′ N. lat., and 2° 35′ and 3° 40′ W. long., and is bounded on the N. by the Firth of Tay, on the E. by the German Ocean, on the S. by the Firth of Forth, and on the W. by parts of Kinross, Perth, and Clackmannan. Its greatest length from east to west is about 42 miles, and its greatest breadth from north to south about 18 miles; its average length is about 36 miles, and its average breadth 14 miles. The area comprises 513 square miles, or 328,427 imperial acres.

The physical aspect of Fife is redeemed from tameness by the picturesqueness and variety of its maritime scenery. With the exception of the "Howe of Fife," and a portion bordering on the east coast line, its surface is pleasantly undulating. A ridge of high ground, commencing with the Lomond Hills, runs in the middle of the county from west to east, advancing to near St. Andrews in its northern part, and terminating with Kellie Law in the south. Between the Lomonds and a spur of the Ochils lies the somewhat extensive plain called the "Howe of Fife;" and to the south of the Lomonds there is another stretch of low ground running westwards to the south of Kinross, presenting, however, greater variety of surface than the plain on the north side of the Lomonds, and interrupted by Saline Hill, Knock Hill, the Hill of Beath, the Cullalo Hills, and other smaller eminences. Further east the land slopes on all sides from the central range towards the sea, but generally with considerable alternations of hill and dale, the large number of wooded knolls presenting in many places a rather picturesque appearance. The most western part of the northern shore is level and marshy, but as the Firth of Tay widens the coast becomes bold and rocky until the village of Tayport is reached. Between Tayport and St. Andrews there is an almost unbroken and pretty wide expanse of downs, after which the coast line is abruptly elevated, presenting a jagged and precipitous wall of rocks whose ridges here and there run out into the sea. Between Fifeness and Burntisland low and sandy stretches, bending often so as to form small bays, are separated from each other by a shore more or less rocky, and occasionally rising into steep and lofty cliffs. The southern coast to the west of Burntisland is wooded in many cases to the water's edge, and gradually the characteristics of river scenery become more marked. The highest summits in the county are West Lomond Hill (1713 feet), East Lomond Hill (1471), Knock Hill (1189), Saline Hill (1178), and Largo Law (965).

The only streams that aspire to the name of rivers are the Eden, which, formed of affluents rising in the Lomonds and in the country to the north and west of that range, flows north-east by Strathmiglo, Kingskettle, and Cupar, and after a course of about 20 miles falls into St. Andrews Bay; and the Leven, which, issuing from Loch Leven in Kinross-shire, flows eastward through a pleasant strath by Leslie, Balgonie, Balfour, and Cameron Bridge, and about 14 miles from its source empties itself into the Firth of Forth at the town of Leven. The presence of mill-dams and manufactories has rendered both the Eden and Leven almost worthless for salmon fishing, but in these rivers, as well as in the other larger streams not polluted by the water of coal-pits, the trout-fishing is excellent. The largest lochs are Lindores Loch (about 70 acres), Loch Fitty (about 50), Lochgelly (about 50), and Kilconquhar Loch (about 40). Several, such as those of Rossie and Lochore, have been drained, and valuable crops are now raised on their beds.

Geology and Minerals.—The rocks of the southern half of Fife—with the exception of a small portion lying to the east of a line drawn between St. Andrews on the north and Anstruther on the south, and another narrow portion lying between Limekilns and Kinghorn—belong chiefly to the coal formation of geologists. This formation is, however, interrupted by the trap rocks which extend through the central part of the county from Saline to near St. Andrews, and by other masses of trap of igneous origin which penetrate especially into the eastern portion of the coal-field, causing innumerable faults and dykes, and elevating the strata by a succession of steps towards the north. The valley of the Eden and a part of the county between St. Andrews and Anstruther is occupied chiefly by the upper strata of the Old Red Sandstone; and in the north-eastern part of the county there is a continuation of the porphyry formation of the Ochils. The Lomonds and the other larger hills are composed of trap, and are capped with greenstone and amygdaloid.

Fife is the third largest coal-producing county in Scotland, being excelled in this respect by Lanark and Ayr. The earliest record regarding the working of coal in Scotland is a charter granted at the end of the 12th century by the proprietor of Carriden to the monks of Holyrood of one-tenth of his coal-works at Carriden. The coal basin is connected under the Forth with that of Mid-Lothian. It may be roughly divided into the coal-fields of Dunfermline and Wemyss or Dysart. In the Dunfermline district, which includes Halbeath, Lochgelly, and Kelty, the principal house-coals are obtained. At Wemyss and Methil gas-coal of the best quality is largely produced; and out of some seams ink-stands, picture-frames, and various other articles of ornament are manufactured. Coal is also wrought at various places in the north-eastern district of the basin, as at Ceres, Radernie, Falfield, and Largoward.[1] Beds of ironstone, limestone, sandstone, and shale lie in many places contiguous to the coal-beds. Blackband ironstone is worked at Lochgelly and at Oakley, and has also been worked at Denhead near St. Andrews. At the two former places there are large smelting furnaces, and vessels are built at Inverkeithing and Kinghorn of home-made iron. Oil shale from the same measure as at Broxburn and West Calder is worked near Burntisland, and at Airdrie near Crail. Limestone is found in nearly all directions in the coal basin; and in the north-eastern part, instead of lying around the outcrop of the coal strata, it occurs at intervals in the midst of the coal measures. The maritime limestone reaches considerable thickness at Kirkcaldy, and resumes the character of mountain limestone at Charleston. The principal limestone quarries are those at Charleston, those near Burntisland, and others in the parish of Cults near Cupar. Freestone of a superior quality is quarried at Strathmiglo, Burntisland, and Dunfermline. Whinstone of great hardness and durability is obtained in nearly every district, and is much used for building purposes. Lead has been worked in the Lomond Hills, and copper and zinc are also said to have been met with in various places. Marl is found, but is not much used for agricultural purposes. The number of persons employed in connection with the various minerals is upwards of 6000. Fossiliferous fish have been found in great abundance and variety at Dura Den near Cupar, and *Brachiopoda* and minute *Entomostraca* are met with throughout the maritime limestone.[2] The most common vegetable impressions met with in the coal strata are *Lepidodendron* and *Stigmaria*. A complete list of the crystals and other precious stones will be found in a paper by Professor Heddle in Ballingall's *Shores of Fife*, but mention may be here made of the pyropes found in the trap tufa at Elie, which are sold to jewellers under the name of Elie rubies, and are regarded as the most valuable Scottish gem. In the *Shores of Fife* will also be found a paper on the flora of the county.

Climate.—On account of the hills diminishing gradually in height towards the east, the greater part of the county is fully exposed to the blasts of east wind from the German Ocean, which in spring often check considerably the progress of vegetation, although their damaging effect is somewhat lessened by numerous belts of wood. The rainfall is below the average, and the climate is on the whole mild, the heat in summer and the cold in winter being modified by proximity to the sea. On the higher ridges, however, the air is often sharp and rigorous; and at an elevation of from 500 to 600 feet the harvests are on an average from three to four weeks later than in the valleys and on the low ground near the coast. Snow seldom lies long near the sea, but the hills and higher grounds are sometimes coated for a considerable period. Notwithstanding the extensive drainage of the lakes and marshes, the valleys are occasionally visited by floating mists and hoar-frosts even in summer, and grain and potatoes often suffer considerable damage in July from this cause.

Agriculture.—According to the agricultural statistics for 1877 the total area of arable land was 244,865 imperial acres, of which 88,012 were under corn crops, 47,742 under green crops, 58,075 under rotation grasses, 49,599 permanent pasture, and 1437 fallow. The acreage under woods was 22,003. Fife is especially a grain-producing county, and the system of cultivation is chiefly directed to that end. The acreage under wheat—which was 12,384 in 1877—has, as in other districts of Scotland, decreased considerably within the last twenty years, the difference being, in Fife, added principally to the acreage under barley. Along the coast the yield of wheat ranges from 32 to 50 bushels per imperial acre, and inland it ranges from 28 to 40. The red variety is now less grown than formerly. Barley, being a less expensive crop than wheat, as well as less trying to the soil, and finding a ready sale, is increasingly cultivated. The acreage under it was 32,265. The variety most largely grown is chevalier. The return on the richer soils is from 40 to 64 bushels per acre, and inland from 32 to 42. Oats—the acreage of which was 39,818—are a good crop all over the county, and yield on the richer soils from 48 to 72 bushels per acre, and inland from 36 to 54. Beans grow exceedingly well on the heavy land, but are not extensively cultivated, the total acreage being only 2147. The acreage under turnips was 29,093. About one half of the turnip break is sown with swedes, and a considerable quantity of turnip seed is also grown in the county. The yield in yellows is often as high as 35 tons per acre, and of swedes 30 tons, but the average yield is about 25 tons for yellows and 18 for swedes. The acreage under potatoes was 17,488. The average yield is from 5 to 8 tons, and on the finer soils the quality cannot be surpassed. No other green crops are cultivated to any extent. As a six-crop rotation—of oats, potatoes or beans, wheat, turnips, barley, and hay or pasture—is the most common one, the acreage under rotation grasses is more than usually small, but within late years a seven-shift has been obtaining favor, and since 1870 the acreage under grasses has consequently been increasing. In some districts, 8, 5, and 4 shifts are severally in use. The acreage in permanent pasture is considerably below the average. It is chiefly confined to the higher grounds, especially those in the eastern district, and is let by annual roup. As a large number of cattle are fed on most farms there is generally a plentiful supply of farm manure; the extensive coast line also affords a large quantity of seaware; and limestone quarries are within easy reach in most districts.

The number of cattle in 1877 was 37,305, or an average of about 15·2 to every 100 acres under cultivation as compared with 23·6 for Scotland. The number of cows and heifers in milk or in calf was only 8553; and it will therefore be apparent both that a comparatively small number of stock is reared, and that dairy produce forms a very unimportant item in the farmer's returns. On most farms, indeed, with the exception of those adjacent to the larger towns, only a sufficient number of cows are kept to supply the wants of the household and farm servants. As the Board of Trade returns are made up in spring they give considerably less than the full number of cattle wintered annually. These are mostly imported from Ireland, and the county on that account is scarcely ever free from foot-and-mouth disease and pleuro-pneumonia. Except a few shorthorns and a yet smaller number of polled Angus, the cows are mostly crosses of a somewhat obscure origin; but a cross between Galloway cows and short-horned bulls has lately been largely introduced. The number of horses was 10,155, or an average of more than 4·1 to every 100 acres, as compared with 4·0 for Scotland. Of these 7821 were used solely for agricultural purposes. They are a strong, active, and hardy breed. The majority have a large admixture of Clydesdale blood, and the number of pure Clydesdales is gradually increasing. There is a large number of excellent ponies and of carriage and hunting horses. The number of sheep was 73,665, or an average of about 30·0 to every 100 acres, as compared with 149·3 for Scotland. Of these 26,375 were under one year old. As, however, the Board of Trade returns are made up at the end of June they give only the minimum number of sheep in the county, the majority being bought in at the end of autumn for winter feeding. More attention is now paid to the breeding of pigs than formerly, and the old breed has been gradually improved by the introduction of Berkshire boars. The number of pigs was 6593, or an average of about 2·7 to every 100 acres as compared with 3·3 for Scotland. The breeding and rearing of poultry do not generally receive much attention, but the number of fowls kept on a farm is sometimes considerable.

According to the returns, out of a total of 2244 holdings 565 did not exceed 5 acres, 647 lay between 5 and 50, 224 lay between 50 and 100, and 808 were above 100, the great majority of which were between 250 and 350, and only 39 above 500. Leases of 19 years are almost universal except in the case of the smallest holdings. A good many farmers hold more than one farm, but the lease of each farm is usually kept separate. The character of the soil is very various, sometimes even on a single farm, and the differences of rental are consequently very great. In the section north of the Eden, the soil, though generally thin, is sharp and fertile, and the rental varies from £1, 10s. to £3. North-east of Leuchars it is very sandy, and a large tract is on that account incapable of cultivation. From St. Andrews all along the coast it is very productive, but the most valuable part is that adjacent to the East Neuk, which consists chiefly of clay and rich loam, and yields an average rental of from £4 to £5 an acre, and in some cases as much as £8. In the district of Elie the soil is generally light and sandy, but remarkably fertile, and in that of Largo it is mostly a rich clayey loam. The average rental of these districts is from £3 to £4 an acre. From Leven to Inverkeithing the land varies from a light and sandy to a rich and clayey loam, and the average rental is about £3. With the exception of the strath of the

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[1] Further particulars regarding the Fife coal-field will be found in the article COAL.

[2] A "Catalogue of the Brachiopoda of Fife and the Lothians" is contained in the *Transactions of the Edinburgh Geological Society* for 1877.

Leven, and part of the valley of the Eden, which consist chiefly of a rich and fertile loam, with a rental averaging from £1, 10s. to £2, 10s., the inland part of Fife is mostly cold and stiff clay or a thin loam with a strong clayey subsoil. It has, however, been greatly improved by cultivation, and the rental, which varies from 15s. to £2, is on an average about £1, 10s. Part of the Howe of Fife is light and shingly, and is covered principally with heather. There are a number of small peat mosses in the county, and near Lochgelly there is yet a pretty extensive tract of waste land, partly moss and partly heath. As nearly all the land suitable for cultivation has been reclaimed for about 40 years, the increase in the rental within that period is not so striking as in some other counties,—the difference since 1850 being only £93,833. Farm management is everywhere conducted on the best modern methods, and within the last twenty-five years the land has been nearly all redrained. A great many of the farmers' houses and of the farm-steadings have been rebuilt within the same period; and on most of the farms the servants' cottages are commodious and comfortable. About three-fourths of the ploughmen are married, and although the majority are only engaged for a year, not more than one-third change their quarters annually. An addition of milk and meal is made to the money wages, and in the case of the unmarried men this forms almost the sole article of diet. The married servants are generally allowed, besides a cottage garden, a portion of land for potatoes sufficient to enable them to rear a pig. All the most improved agricultural implements are in use. Steam cultivation, for which most of the land on account of its freedom from stones and its depth and stiffness of soil is specially well adapted, is being rapidly introduced. Reaping machines are almost universally employed, and most of the grain is thrashed by portable steam-mills. Full particulars regarding the whole subject of Fife agriculture will be found in a paper by James Macdonald, published in the *Transactions of the Highland and Agricultural Society of Scotland*, 1876.

According to the owners and heritages return, 1872–73, the land was divided between 10,410 proprietors, holding land the gross annual value of which was £905,577. Of the owners 82·9 per cent. possessed less than one acre, and the average value all over was £2, 19s. 6d. There were 11 proprietors holding upwards of 4000 acres, viz., John Balfour (Balbirnie) 10,590; George Johnston (Lathrisk) 10,005; Earl of Moray (Donibristle) 7463; Colonel Ferguson (Raith) 7135; Lieutenant-Colonel Tyndall Bruce (Falkland House) 7058; Randolph G. E. Wemyss and trustees of J. H. E. Wemyss (Wemyss Castle) 6925; Earl of Glasgow (Crawford Priory) 5625; Earl of Zetland 5566; Sir Coutts Lindsay (Balcarres) 4672; George Clark Cheape (Wellfield) 4230; and John Anstruther Thomson (Charleton) 4034.

Fife is perhaps below the average as a game-preserving county. Rabbits, hares, pheasants, and partridges are pretty numerous in some districts; roe deer are occasionally seen; wild geese, ducks, and teal frequent the lochs; and grouse and black-cock are somewhat plentiful on the Lomond moors. The pigeon houses have been estimated at 300. The county is particularly well adapted for fox-hunting, and the Fife fox-hounds are now divided into an eastern and a western pack.

Manufactures and Trade.—The staple manufacture is linen. The chief seats of the linen cloth manufacture—which ranges from the coarsest ducks and sackings to the finest damask—are Kirkcaldy and Dunfermline. The largest flax spinning mill is that at Prinlaws near Leslie. The other seats of the linen trade are Auchtermuchty, Cameron Bridge, Cupar, Dura Den, Dysart, Falkland, Freuchie, Guardbridge, Kinghorn, Kingskettle, Ladybank, Leven, Markinch, Newburgh, Springfield, Strathmiglo, Tayport, and East and West Wemyss. There are bleaching greens on the banks of the Eden and Leven, and also at Kirkcaldy, Ceres, and Dunfermline. According to the census of 1871 the number of persons engaged in the linen manufacture was 17,055, of whom 5742 were males and 11,313 females. In the jute manufacture 29 males and 23 females were employed. Kirkcaldy possesses 6 large floor-cloth manufactories, besides others for the manufacture of linoleum. In various towns woollen cloth is manufactured, but only to a small extent. There are fishing-net manufactories at West Wemyss, Kirkcaldy, and Largo. There are breweries and tanneries in the principal towns. The largest distilleries are at Cameron Bridge and Burntisland. Paper is manufactured at Guardbridge, Markinch, and Leslie; earthenware at Kirkcaldy; tobacco at Kirkcaldy and Dunfermline; and oilcake in a few places. Kirkcaldy and Dunfermline possess iron-foundries; and shipbuilding is carried on at Kinghorn, Dysart, Burntisland, Inverkeithing, and Tayport. The principal port is Kirkcaldy; the chief imports are flax and timber, and the chief exports coals and potatoes. The largest salmon fisheries are at Newburgh, but there are others at various parts on the east and south coast. The chief seat of the herring fishing is Anstruther; and the number of boats in the Anstruther district, which includes all the fishing stations in the county, is nearly 800, with a total value of nearly £100,000. For some years the take of herrings on the Fife coast has been very small, and the majority of the Fife fishermen now prosecute the herring fishing at the northern stations.

Towns and Villages.—The number of towns and villages in Fife is exceptionally great. The south coast especially is very thickly populated, and along its whole extent there is almost a continuous line of houses. The large extent of downs on the sea-coast affords great facilities for the Scottish national game of golf. Besides the famous golfing green at St. Andrews, there are others at Cupar, Crail, Elie, Lundinmill, Leven, Innerleven, Wemyss, and Burntisland. The number of boroughs is 16, of which three, Auchtermuchty (1082), Falkland (1144), and Newburgh (2182), are royal; and 13 royal and parliamentary, viz., Anstruther Easter (1289), Anstruther Wester (484), Burntisland (3265), Crail (1112), Cupar (5105), Dunfermline (14,963), Dysart (8919), Inverkeithing (1755), Kilrenny (2539), Kinghorn (1739), Kirkcaldy (12,422), Pittenweem (1760), and St. Andrews (6316). Among the other towns and villages the principal along the coast are Limekilns (735), with a small harbor; Charleston (749), the shipping port of Dunfermline, with an iron-foundry, limeworks, and manufactures of salt; Aberdour (622), a favorite watering place; the manufacturing village of East Wemyss (777); West Wemyss (1231), partly mining but chiefly fishing; the mining village of Methil (648); the fishing villages of Buckhaven (2187), Innerleven (358), and St. Monance (1648); the watering places of Leven (2501), Largo (521), and Earlsferry and Elie (1032); and on the northern coast the towns of Tayport (2498) and Newport (1507). Inland there are Freuchie (1195), Kingskettle (643), Ladybank (772), Leslie (3768) Milton of Balgonie (396), Pitlessie (401), Springfield (608), and Strathmiglo (1509), all chiefly manufacturing; Cairneyhill (435), Cardenden (355), Charleston (749), Coalton (442), Coaltown (343), Cowdenbeath (1457), Crossgates (1181), Donibristle (412), Dunshalt (481), Halbeath (800), Largoward (325), Lochgelly (2369), Methilhill (480), Thornton (526), Townhill (855), Wellwood (678), Windygates (420), all principally mining; and Ceres (1111), Colingsburgh (351), Fordel (641), Kennoway (835), Kilconquhar (381), Kingsbarns (411), Kirkton of Largo (353), Leuchars (523), Lundinmill (539), and Strathkinness (619), with a mixed population—mining, manufacturing, agricultural, or shopkeeping.

Railways.—Fife is crossed from Burntisland to Newport by the North British Railway between Edinburgh and Dundee; and from the main line branches diverge at Thornton to Dunfermline and Kinross, and to Leven and the east of Fife; at Markinch to Leslie; at Ladybank to Auchtermuchty and Kinross and to Perth; and at Leuchars to St. Andrews.

Population.—The total population of the county in 1871 was 160,735, of whom 75,127 were males and 85,608 females. The population in 1861 was 154,770. In the towns the population in 1871 was 73,929 as compared with 66,516 in 1861, in the villages 47,759 as compared with 41,627, and in the rural districts 39,047 as compared with 46,627.

One member of parliament is returned by the county; one each by the Kirkcaldy and St. Andrews districts of burghs; and Dunfermline and Inverkeithing are grouped with other boroughs under the Stirling district in returning a fourth.

History and Antiquities.—A dim conception of the kingdom of Fife at a period regarding which there are scanty written records may be obtained from its somewhat important and interesting archæological remains. Those of greatest antiquity are perhaps two canoes found more than 60 years ago in the bed of the Tay opposite Lindores; the relics of the *Bos primigenius*, an inhabitant of the primeval forest; and the remains of many of the ancient hill forts—chief of which may be mentioned those at Norman's Law and on the Craig of Clachard, both in the parish of Abdie—constructed at a period in all probability considerably anterior to the Roman invasion. Traces yet exist in several places of the foundations of those circular tent-like dwellings noticed by Julius Cæsar in other parts of Britain as identical with those of the Gauls of the continent of Europe. The marks of Roman occupation are now nearly all obliterated by cultivation, but sword blades, spear heads, and hoards of Roman coins have been found at various places; and vestiges of a number of Roman buildings were in existence 100 years ago. According to Sir Robert Sibbald, traces of Roman camps were in his lifetime visible near Burntisland and Dunfermline; and slight marks of two yet remain in the parish of Carnock at a place known by the name of the Camp Farm. At Lochore, near a place now occupied by the farm of Chapel, there existed about a century ago the outlines of a permanent Roman station of considerable strength, and occupying a central position on the route between Queensferry and the firth of Tay. It was near this fortification that in all probability took place the night attack on the ninth legion, mentioned by Tacitus in the 25th chapter of his *Agricola*.

The earliest inhabitants of Fife and Strathearn of whom we have any knowledge were of Celtic origin, and were called by the Romans Horesti. It is uncertain when the Romans retired from this district, but they did not occupy it for a length of time sufficient to effect any marked change on the civilization of the natives, who made frequent incursions into the Roman province, and received from their Romanized neighbors the name of Picti, the part of Scotland north of the Forth being known as Pictavia so late as the 8th century. The title kingdom ultimately inherited by Fife was doubtless applied in the first instance to the whole of Pictavia; and the continuance of the title to a smaller portion, of which the present Fife forms the eastern half, was due as much to its being the southern part of Pictavia as to its distinct peninsular form, and to the fact that Pictish kings had their residence within its territories. In any case the title as applied to Fife has the sanction of very ancient usage. In the tract of the *Scots of Dalriada* there occur the words the "men of Fife in the sovereignty;" and in Wynton's *Chronicle*, whose date is 1380, Fife is spoken of as a "kynrick" or kingdom. The power and influence of the thanes of Fife, and the existence afterwards of royal residences at Dunfermline and Falkland, doubtless aided in continuing the title down to later times. The first trace of the name Fife occurs in the old verses ascribed to St. Columba, where, under the form *Fif*, it is used as the designation of one of the seven provinces into which, according to Beda, the ancient kingdom of Pictavia was divided. As to the exact boundaries of Fife at this period there is no certain information, but in all probability it comprehended the greater part of the territory between the Forth and the Tay, thus including Monteith, Strathearn, and the shires of Clackmannan and Kinross, but probably in its south-western part ceding a portion of its present area to the province of Fortreim. At a later period Fife was divided into the "stewartries" of Clackmannan, Culross, and Kinross; and about 1426 Kinross was divided into the shires of Kinross and Fife. In 1685 the parishes of Orwell, Tulliebole, and Cleish were disjoined from Fife and added to Kinross. The term *Fiv* seems identical with the Jutland word *Fibh* (pronounced exactly as *Fife* is now pronounced), meaning forest, and was probably first made use of by the Frisians to designate the country immediately interior to the estuaries of the Tay and Forth, where an immigration of Frisian tribes took place about the end of the 4th century.[1] Evidence of a Danish settlement subsequent to the Frisian immigration is presented in the names of several of the homesteads, as well as in the presence of the word *Law* (Danish *Hleaw*, a heaped-up mound marking the graves of illustrious dead) in Norman's Law, Largo Law, Norris Law, and several other hills. On a mound at Norris Law a complete set of silver armor was discovered about 1817, but it found its way to the melting pot before its antiquarian importance was recognized. Several relics found along with it have, however, been preserved, and they are graven with symbols similar to those of the oldest sculptured stones, one of which yet exists at Lindores, and contains no Christian figures. The standing stones of Lundin, near Leven, are, according to the tradition of the district, the burial stones of Danish chiefs who fell in a battle which took place in the immediate neighborhood. Of the sculptured stones erected subsequent to the teaching of St. Columba, which are either cruciform or graven with a large cross, there are, besides several fragment at different places, four standing in a pretty entire condition, viz., at Docton Kinglassie, at Abercromby, at Sauchope near Crail, and at Mugdrum near Newburgh. Still more interesting memorials of the early Christian missionaries are the crosses and other figures graven on the walls of the numerous caves which exist along the coast from St. Andrews to Dysart.[2] After the time of the Culdees the next archæological relic of importance is the pedestal of the cross of Macduff near Newburgh, erected by the thane of Fife after his escape from the vengeance of the usurper Macbeth.

Monastic foundations were pretty numerous in Fife. On the island of Inchkolm there yet stand the cloister, prison, refectory, and chapter-house of an abbey of the Canons Regular, founded in 1213; and the same order possessed priories at Pittenweem (of which there are yet interesting ruins), at St. Andrews (founded in 1221), and in the Isle of May (1141). Convents of the Dominicans existed at Cupar, at St. Monans (1369), and St. Andrews (1274). The Benedictines founded Dunfermline Abbey in 1214; and Lindores Abbey, which, from the few architectural details now left, must have been of great elegance, owed its origin to the Tyronenses in 1178. Balmerino Abbey, of which there yet exist the roofless walls of the chapter-house with the cloisters, was founded by the White Cistercians in 1229. The Franciscans had a monastery at Inverkeithing; an Observantine convent was founded at St. Andrews in 1478; and one of the only two nunneries of the Clarisses in Scotland existed at Aberdour. The churches of Crail (1517), Kirkheugh, and St. Salvators (1450) were collegiate churches; St. Monans possesses a fine Gothic church of the Middle Pointed style, built about 1365, and restored in 1828; a fine old Norman church still stands at Aberdour; there are ruins of an old church at Abdie consecrated in 1242; and the semicircular apse of an old Norman structure forms part of the present parish church at Leuchars. Further particulars regarding the ecclesiastical antiquities of Fife will be found in the accounts of the different burghs.

Among the old castles not mentioned under the names of burghs the principal are the ruins of Balcomie Castle, near the East Neuk, where stress of weather compelled Mary of Guise to land in 1538; two square towers of an old building near East Wemyss, said to have been the residence of Macduff; the present castle of Wemyss—a plain building with an old castellated wing—where Queen Mary met her future husband Darnley; the ruin of Ravenscraig, near Dysart, referred to in Sir Walter Scott's ballad of "Rosabelle"; the ruined tower of the old castle of Balwearie, near Kirkcaldy, the birthplace of Sir Michael Scott the astrologer; the square tower of the old castle of Rosythe, near Inverkeithing, visited by Oliver Cromwell when in Fife; the castellated mansion of Aberdour, at one time the residence of James, fourth earl of Morton; the fortress of Lochore, built in the time of Malcolm Canmore; the old stronghold of Balgonie; part of the round tower of the old castle of Creich, the residence of the Beatons, and the birthplace of Mary Beaton, one of the "four Maries" of Mary Queen of Scotland; Ballinbreich Castle, in the parish of Flisk, for a long time the residence of the earls of Rothes; and the ruined castle of Dairsie, where, it is said, Archbishop Spottiswoode wrote his history.

Among the modern residences of the gentry may be mentioned Raith House (Col. Ferguson), built by Lord Raith in the 17th century, a plain building, finely situated on an elevated plateau; Balcarres House (Sir Coutts Lindsay), a baronial structure lately enlarged, with fine terraced gardens in front; Balcaskie House (Sir Robert Anstruther) with terraced gardens in the French style; Falkland House (Tyndall Bruce), a fine mansion in the Elizabethan style, and beautifully situated at the base of the East Lomond; Donibristle (Earl of Moray), and Dysart House (Earl of Rosslyn), both romantically situated close on the sea-shore; Leslie House (Hon. G. Waldegrave Leslie), at one time one of the largest mansions in Scotland, but on account of a fire now only a fourth of its original size, containing a gallery with portraits of the successive earls of Rothes and many of their contemporaries; Largo House, where at one time was the patrimony of Sir Andrew Wood; Inchdairnie (Roger Sinclair Aytoun), a fine mansion in the Scotch baronial style; Crawford Priory (Earl of Glasgow), a castellated mansion lately greatly enlarged; and Mount Melville (J. Whyte Melville).

On account of its isolated situation, Fife, except at the Reformation and during the times of the Covenanters, has not been prominently connected with the eventful periods of later Scottish history, the only circumstances worthy of mention being the battle of Dalcearrens Field, near Lindores, in which Sir William Wallace, in June, 1300, inflicted a heavy defeat on the English; the capture in 1651 of Burntisland by the soldiers of the Commonwealth, who garrisoned the town for several years, and in this way kept a check on the Royalist sympathizers of the "kingdom;" the landing of the earl of Mar at Elie in 1715 to take part in the Jacobite insurrection; and the arrival shortly afterwards of 4000 of the insurgents with the view of crossing from Fife in boats to join the southern army. Among the eminent persons connected with Fife may be mentioned Sir David Lindsay of the Mount, Sir Michael Scott the astrologer, the parliamentary general Leslie, Lord Leven, Sir David Wilkie, Adam Smith, Thomas Chalmers, Lord Chancellor Campbell, Mrs. Somerville, and the seventh and eighth earls of Elgin.

Sir Robert Sibbald's *History of the Sheriffdoms of Fife and Kinross* is chiefly of value for the information it contains regarding the condition of Fife at the period of the writer. Varied information regarding the history and antiquities of the shire will be found in Alex. Campbell's *Journey from Edinburgh through Fifeshire*, 1805; Rev. A. Small's *Roman Antiquities in Fifeshire*, 1823; Rev. J. W. Taylor's *Historical Antiquities of Fife*, 1875; and Rev. W. Wood's *East Neuk of Fife*, 1862. See also Swan's *Views of Fife;* the beautifully illustrated *Shores of Fife*, edited by Wm. Ballingall, 1872; and an interesting article on the "Kingdom of Fife," in *Fraser's Magazine* for January, 1878. (T. F. H.)

FIFTH MONARCHY MEN, a Puritan sect who supported Cromwell's government in the expectation that it was a preparation for the "fifth monarchy,"—that is, the monarchy which should succeed the Assyrian, the Persian, the Grecian, and the Roman, and during which Christ should reign with his saints on earth for a thousand years. Being disappointed at the delay in the fulfilment of their hopes, they attempted to foment a political agitation against the government of Cromwell, but the arrest of Feake and Powell, two of the most violent of their number, was sufficient for a time to damp their ardor, and they were content to nourish their dreams in secret until after the Restoration, when, on January 6, 1661, fifty of them, headed by a wine-cooper named Venner, made a mad effort to attain possession of London in the name of "King Jesus." Most of the fifty were either killed or taken prisoners, and on January 19 and 21 Venner and ten others were executed for high treason. From that time the special doctrines of the sect either died completely out, or became merged in a milder form of millenarianism similar to that which still exists at the present day.

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[1] See paper by W. F. Skene in the *Proceedings of the Society of Antiquaries of Scotland*, vol. iv.

[2] See notes on the sculptured caves near Dysart, by Miss C. M'Lagan, in vol. xi. of the *Proceedings of the Society of Antiquaries of Scotland;* and *Archaic Sculptures of Cups and Circles*, by Sir James Y. Simpson, 1867.

FIG, the popular name given to plants of the genus *Ficus*, an extensive group, included in the natural order *Moraceæ*, and characterized by a remarkable development of the pear-shaped receptacle, the edge of which curves inwards, so as to form a nearly closed cavity, bearing the numerous fertile and sterile flowers mingled on its surface (see BOTANY, fig. 150). The figs vary greatly in habit,—some being long trailing shrubs, others gigantic trees, among the most striking forms of those tropical forests to which they are chiefly indigenous. They have alternate leaves, and abound in a milky juice, usually acrid, though in a few instances sufficiently mild to be used for allaying thirst. This juice contains caoutchouc in large quantity.

Ficus Carica, which yields the well-known figs of commerce, is a bush or small tree, rarely more than 18 or 20 feet high,—with broad, rough, deciduous leaves, very deeply lobed in the cultivated varieties, but in the wild plant sometimes nearly entire. The green, rough branches bear the solitary, nearly sessile receptacles in the axils of the leaves. The male flowers are placed chiefly in the upper part of the cavity, and in most varieties are few in number. As it ripens, the receptacle enlarges greatly, and the numerous single-seeded pericarps become imbedded in it. The fruit of the wild fig never acquires the succulence of the cultivated kinds. The fig seems to be indigenous to Asia Minor and Syria, but now occurs in a wild state in most of the countries around the Mediterranean. From the ease with which the nutritious fruit can be preserved, it was probably one of the earliest objects of cultivation, as may be inferred from the frequent allusions to it in the Hebrew Scriptures. From a passage in Herodotus the fig would seem to have been unknown to the Persians in the days of the first Cyrus; but it must have spread in remote ages over all the districts around the Ægean and Levant. The Greeks are said to have received it from Caria (hence the specific name); but the fruit so improved under Hellenic culture that Attic figs became celebrated throughout the East, and special laws were made to regulate their exportation. From the contemptuous name given to informers against the violation of those enactments, *συκοφάνται* (*σῦκον* and *φαίνω*), our modern word sycophant is traced. The fig was one of the principal articles of sustenance among the Greeks; the Spartans especially used it largely at their public tables. From Hellas, at some prehistoric period, it was transplanted to Italy, and the adjacent islands. Pliny enumerates many varieties, and alludes to those from Ebusus (the modern Iviça) as most esteemed by Roman epicures; while he describes those of home growth as furnishing a large portion of the food of the slaves, particularly those employed in agriculture, by whom great quantities were eaten in the fresh state at the periods of fig-harvest. In Latin myths the plant plays an important part. Held sacred to Bacchus it was employed in religious ceremonies; and the fig-tree that overshadowed the twin founders of Rome in the wolf's cave, as an emblem of the future prosperity of the race, testified to the high value set upon the fruit by the nations of antiquity. The tree is now cultivated in all the Mediterranean countries, but the larger portion of our supply of figs comes from Asia Minor, the Spanish Peninsula, and the south of France. Those of Asiatic Turkey are considered the best. The varieties are extremely numerous, and the fruit is of various colors, from deep purple to yellow, or nearly white. The trees usually bear two crops,—one in the early summer from the buds of the last year, the other in the autumn from those on the spring growth; the latter forms the chief harvest. Many of the immature receptacles drop off from imperfect fertilization, which circumstance has led, from very ancient times, to the practice of *caprification*. Branches of the wild fig in flower are placed over the cultivated bushes. Certain hymenopterous insects, of the genera *Blastophaga* and *Sycophaga*, which frequent the wild fig, enter the minute orifice of the receptacle, apparently to deposit their eggs; conveying thus the pollen more completely to the stigmas, they insure the fertilization and consequent ripening of the fruit. By some the nature of the process has been questioned, and the better maturation of the fruit attributed merely to the stimulus given by the puncture of the insect, as in the case of the apple; but the arrangement of the unisexual flowers in the fig renders the first theory the more probable. In some districts a straw or small twig is thrust into the receptacle with a similar object. When ripe the figs are picked, and spread out to dry in the sun,—those of better quality being much pulled and extended by hand during the process. Thus prepared, the fruit is packed closely in barrels, rush baskets, or wooden boxes, for commerce. The best kind, known as elemi, are shipped at Smyrna, where the pulling and packing of figs form one of the most important industries of the people.

This fruit still constitutes a large part of the food of the natives of western Asia and southern Europe, both in the fresh and dried state. A sort of cake made by mashing up the inferior kinds serves in parts of the Archipelago as a substitute for bread; mixed with almonds, a similar preparation is sold in the streets of our large towns, and eaten as a luxury by the poor, under the name of "fig-cake." Alcohol is obtained from fermented figs in some southern countries; and a kind of wine, still made from the ripe fruit, was known to the ancients, and mentioned by Pliny under the name of *sycites*. Medicinally the fig is employed as a gentle laxative, when eaten abundantly often proving useful in chronic constipation; it forms a part of the well-known "confection of senna." Cut open, the fruit is a popular cataplasm for boils and sores, an application as old as the days of Hezekiah. It is recommended as a demulcent in disorders of the throat, being given in the form of decoction. The milky juice of the stems and leaves is very acrid, and has been used in some countries for raising blisters. The wood is porous and of little value; though a piece, saturated with oil and spread with emery, is in France a common substitute for a hone.

The fig is grown for its fresh fruit (eaten as an article of dessert) in all the milder parts of Europe, and in the United States, with protection in winter, succeeds as far north as Pennsylvania. In England it is usually trained against a wall, and sheltered with mats or branches in severe frosts, though in some warm places near the southern coast small plantations of standard bushes exist; one of the oldest is probably that at Tarring, near Worthing. The tree is propagated by cuttings or layers; it requires care in pruning, and the immature fruit, formed late in summer, should be removed to strengthen the shoots. The crop ripens in August and September. The fig was introduced into England by Cardinal Pole, from Italy, early in the 16th century.

The Sycamore Fig, *Ficus Sycomorus*, is a tree of large size, with heart-shaped leaves, which, from their fancied resemblance to those of the mulberry, gave origin to the name *Συκόμορος*. From the deep shade cast by its spreading branches, it is a favorite tree in Egypt and Syria, being often planted along roads and near houses. It bears a sweet edible fruit, somewhat like that of the common fig, but produced in racemes on the older boughs. The apex of the fruit is sometimes removed, or an incision made in it, to induce earlier ripening. The ancients, after soaking it in water, preserved it like the common fig. The porous wood is only fit for fuel.

The Sacred Fig, Pippul, or Bo, *Ficus religiosa*, a large tree with heart-shaped, long-pointed leaves on slender footstalks, is much grown in southern Asia. The leaves are used for tanning, and afford lac, and some caoutchouc is obtained from the juice; but in India it is chiefly planted with a religious object, being regarded as sacred by both Brahmans and Buddhists. The former believe that the last avatar of Vishnu took place beneath its shade. A gigantic bo, described by Emerson Tennent as growing near Anarajapoora, in Ceylon, is, if tradition may be trusted, one of the oldest trees in the world. It is said to have been a branch of the tree under which Gautama Buddha became endued with his divine powers, and has always been held in the greatest veneration. The figs, however, hold as important a place in the religious fables of the East as the ash in the myths of Scandinavia.

Ficus elastica, the India-rubber Tree, the large, oblong, glossy leaves, and pink buds of which are so familiar in our greenhouses, furnishes most of the caoutchouc obtained from the East Indies. It grows to a large size, and is remarkable for the snake-like roots that extend in contorted masses around the base of the trunk. The small fruit is unfit for food. For the BANYAN see vol. iii. p. 300.

The trade in the edible fig is one of long standing, and of considerable importance in the regions devoted to the cultivation of the tree. Figs are easily preserved by simply drying in the sun, the grape sugar which they contain in abundance being thus rendered available for their preservation. Recently the practice of preserving fresh undried figs in tins has been adopted, but the amount used in that form is as yet insignificant compared with the quantities preserved by drying. Of the dried and pressed fruit the import into Great Britain alone averages from six to seven thousand tons annually, the following being the official returns for the five years ended 1876:—

	Cwts.	Value.	Duty.
1872	141,847	£231,571	£38,885
1873	120,347	220,413	35,021
1874	74,168	149,089	23,685
1875	124,609	252,022	32,749
1876	163,163	318,717	39,925

The greater part (about four-fifths) of these imports comes from Asia Minor, the remainder being produced in various Mediterranean countries. (C. P. J.)

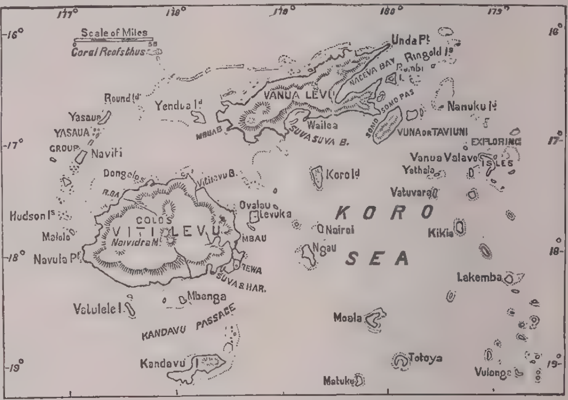
FIGARO, a famous dramatic character first introduced on the stage by Beaumarchais in the *Barbier de Séville*, the *Mariage de Figaro*, and the *Folle Journée*. The name is said to be an old Spanish and Italian word for a wigmaker, connected with the verb *cigarrar*, to roll in paper. Many of the traits of the character are to be found in earlier comic types of the Roman and Italian stage, but as a whole the conception was marked by great originality; and Figaro soon seized the popular imagination, and became the recognized representative of daring, clever, and nonchalant roguery and intrigue. Almost immediately after its appearance, Mozart chose the *Marriage of Figaro* as the subject of an opera, and the *Barber of Seville* was treated first by Parsiello, and afterwards in 1816 by Rossini. In 1826 the name of the witty rogue was taken by a journal which continued till 1833 to be one of the principal Parisian periodicals, numbering among its contributors such men as Jules Janin, Paul Lacroix, Léon Gozlan, Alphonse Karr, Dr. Veron, Jules Sandeau, and George Sand. Various abortive attempts were made to restore the *Figaro* during the next twenty years; and at length in 1854 the efforts of M. Villemessant were crowned with success. The new journal not only still exists, but has attained unusual popularity.

See Marc Monnier, *Les Aieux de Figaro*, 1868; H. de Villemessant, *Mémoires d'un Journaliste*, 1867.

FIGEAC, a town of France, capital of an arrondissement in the department of Lot, is situated on the right bank of the Selle, 32 miles N.E. of Cahors. It is enclosed by an amphitheatre of wooded and vine-clad hills, but is ill-built, and its streets are narrow and dirty. Many of the buildings are remarkable for their antique style. It was formerly surrounded by ramparts and ditches, but these were demolished in 1622, though remains of them still exist. Figeac has linen and cotton manufactures, dyeworks, and tanneries, and also a considerable trade in cattle and wine. Among the public edifices worthy of notice are the communal college, the hospital, the abbey church of St. Sauveur, the church of Notre Dame du Puy, and the Château de la Baleine, now transformed into a law court, but still retaining its feudal exterior. At the south and west extremities of the town are two obelisks called *les aiguilles*, octagonal in form, and upwards of 50 feet in height, which were used in former times as fire beacons to guide travellers by night. Champollion the archæologist was born at Figeac in 1790, and an obelisk has been erected to his memory near the river. The town owes its origin to a Benedictine abbey founded by Pepin the Short in 755. It was besieged by the Huguenots in 1568 without success, but was conquered by them in 1576, and remained one of their chief fortresses till 1622. The population in 1876 was 5660.

FIGUERAS, a frontier town of Spain, in the province of Gerona, and 20 miles W.N.W. of the town of that name. It is a straggling town, situated in a rich plain of olives and rice. It possesses a beautiful parish church, two monasteries, and a hospital. The principal manufactures are leather and paper, and it has some trade with France. The citadel, an irregular pentagonal structure on the principles of Vauban, is considered one of the strongest fortresses in Europe. It was built by Ferdinand VI., and its situation renders it the key to the frontier. Its cost amounted to £285,000, and it contains accommodation for 16,000 men and 500 horses. The buildings inside the walls are all bomb-proof, and the natural adaptation of its situation has been so taken advantage of that trenches can scarcely be opened on any side, the ground being everywhere rocky. In 1794 it was surrendered to the French, but it was retaken in 1795. It was again captured by the French in 1808, and though they were forced to vacate it in 1811, they recaptured it on the 19th August of the same year. In 1813 they were again driven out, but it again capitulated to them in 1823. The population of Figueras is about 10,000.

FIJI ISLANDS. The Fiji, or more correctly Viti, archipelago (Fiji being the pronunciation in the eastern part of the group frequented by the Tongans) is one of the most important in the South Pacific. Its nearest neighbors are the Samoan group 300 miles to the N.E., and the Tongan or Friendly rather nearer to the S.E. Lying between 177° E. and 178° W. long., and between 15° 40′ and 20° S. lat., it is beyond the limits of the perpetual S.E. trades, while not within the range of the N.W. monsoons. From April to November the winds are steady between S.E. and E.N.E., after which the weather becomes uncertain and the winds often northerly. In February and March heavy gales are frequent, and hurricanes sometimes occur, causing scarcity by destroying the crops. The rainfall is much greater on the windward than on the lee sides of the islands (108 inches at Levuka), but the mean temperature is much the same, viz., about 80° F. The greatest rise and fall of the tide is six feet. The islands cover an area of some 7400 square miles, or about that of Wales. Excluding the two large islands, they are classed by the natives in three groups, viz., the "Lau" or Windward Islands, mostly small, but many of them very fertile, of which Lakemba is the most important; "Loma-i-Viti," or Inner Fiji, *i.e.*, the islands inclosed between the Lau and the two great islands Viti Levu (Great Viti) and Vanua Levu (Great Land); and the "Ra" or Leeward Islands, a chain of numerous small islands bounding the group to the westward.



Map of Fiji Islands.

Scenery.—There is not much level country, except in the small coral islets, and certain rich tracts along the coasts of the two large islands, especially near the mouths of rivers. Elsewhere hill and valley, peak and precipice, assume the most romantic forms, clothed almost always with a beautiful and luxuriant vegetation. The large islands have a considerable extent of undulating country, dry and open on their lee sides; the peaks rise from 4000 to 5000 feet.

Climate and Diseases.—The climate, especially from November to April, is somewhat enervating to the Englishman, but not unhealthy. Fevers are hardly known. Dysentery, which is very common, and the most serious disease in the islands, is said to have been unknown before the advent of Europeans. Elephantiasis is common, but is curable by removal into higher and better air. It is sometimes produced by immoderate use of kava. Influenza is at times prevalent and very fatal. Rheumatism is common. The natives have a bad skin disease, thoko, affecting also the bones, from which few escape; but it is said to be avoidable by a sounder hygiene.

Rivers.—Streams and rivers are abundant,—the latter very large in proportion to the size of the islands, affording a water-way to the rich districts along their banks. These and the extensive mud flats and deltas at their mouths are often flooded, by which their fertility is increased, though at a heavy cost to the cultivator.

Geological Formation.—The geological features of the group point to repeated volcanic action at considerable intervals. The tops of many of the mountains, from Kandavu in the S.W., through Nairai and Koro, to the Ringgold group in the N.E., have distinct craters, but their activity has long ceased. The various decomposing volcanic rocks—tufas, conglomerates, and basalts—mingled with decayed vegetable matter, and abundantly watered, form a very fertile soil. Most of the high peaks on the larger islands are basaltic, and the rocks generally are igneous, with occasional upheaved coral found sometimes over 1000 feet above the sea; but certain sedimentary rocks observed on Viti Levu seem to imply a nucleus of land of considerable age. Hot springs occur on Viti Levu, on Ngau, at Wainunu and Savu-Savu on Vanua Levu; the last have a temperature of 200°–210° F., and cover an area of half a square mile. Earthquakes are occasionally felt. Volcanic activity in the neighborhood is further shown by the quantities of pumice-stone drifted on to the south coasts of Kandavu and Viti Levu; malachite, antimony, and graphite, gold in small quantities, and specular iron-sand occur.

Islands.—The islands number about 250, of which perhaps 80 are inhabited. Viti Levu, about 80 by 55 miles, is the largest and most important from its fertility and variety of surface, number of large rivers, and population,—which is about one-third of that of the whole group. Vanua Levu, somewhat smaller, about 100 by 25 miles, and less fertile and populous, has good anchorages along its entire south coast. All the others are much smaller. Taviuni, 25 by 5 miles, with a central ridge 2100 feet high and a lake at the top, is fertile, but exceptionally devoid of harbors. Kandavu, 25 miles long and very narrow, well-timbered, with a good harbor, contains a Wesleyan training institution and model village. Fulanga and Kambara are well-timbered and frequented by canoe-builders. Totoya, Moala, Ngau, Mbengga, Nairai, Koro, are all valuable islands (the last especially fertile), 15 to 30 miles in circumference. The Wilson or Exploring group consists of seven islands of considerable size, well situated for the resort of vessels, with anchorages safe and easily reached, and supplies abundant. The navigation between the islands is in many places intricate, but the dangers can be much lessened by good surveys, careful pilotage, and increased use of steam. There are good anchorages inside the barrier reefs; the best harbors are those of Suva in Viti Levu, Savu-Savu and Mbua or Sandalwood Bays in Vanua Levu, Galoa Bay in Kandavu, and Levuka.

Vegetation.—The vegetation is mostly of a tropical Indo-Malayan character,—thick jungle with great trees covered with creepers and epiphytes. The lee sides of the larger islands, however, have grassy plains suitable for grazing, with scattered trees, chiefly *Pandanus*, and ferns. The flora has also some Australian and New Zealand affinities (resembling in this respect the New Caledonia and New Hebrides groups), shown especially in these western districts by the *Pandanus*, by certain acacias, epacrids, *Casuarinæ*, and *Dammara*, and by the peculiar habit of other species. At about 2000 feet the vegetation assumes a more mountain type.

Among the many valuable timber trees are the vesi (*Afzelia bijuga*); the dilo (*Calophyllum Inophyllum*), the oil from its seeds being much used in the islands, as in India, in the treatment of rheumatism; the dakua (*Dammara Vitiensis*) allied to the New Zealand kauri; the vaivai (*Serianthes Vitiensis*), the *Casuarina*, and others, chiefly conifers, Guttiferæ, Myrtaceæ, and Leguminosæ. Most of the fruit trees are also valuable as timber. The native cloth (masi) is beaten out from the bark of the paper-mulberry (*Broussonetia papyrifera*), cultivated for the purpose. Several useful fibres are supplied by plants of the Musaceæ, Bromelideæ, Thymeleæ, and other orders. Of the palms the cocoa-nut is by far the most important. Dr. Seemann discovered a sago-palm known to the natives by the name of sogu, though they were then ignorant of its use. The yasi or sandalwood is now rarely found, and only in a small district at the western extremity of Vanua Levu. There are various useful drugs, spices and perfumes; and many plants are cultivated for their beauty, to which the natives are keenly alive. Among the plants used as pot-herbs are several ferns, and two or three Solanums, one of which, *S. anthropophagorum*, allied to our *S. nigrum*, was one of certain plants always cooked with human flesh, which is said to be otherwise difficult of digestion. The use of the kava root, here called yanggona (*Macropiper methysticum*), from which the well-known national beverage is made, was introduced, it is said, from Tonga.

Of fruit-trees, besides the cocoa-nut, we can only mention the many varieties of the bread-fruit, of bananas and plantains, of sugar-cane and of *Citrus;* the wi (*Spondias dulcis*), the kavika (*Eugenia malaccensis*), the ivi or Tahitian chestnut (*Inocarpus edulis*), the pine-apple, and others recently introduced. Edible roots are especially abundant. The chief staple of life is the yam, the names of several months in the calendar having reference to its cultivation and ripening. The *Dioscorea alata* is the variety chiefly planted; its roots are sometimes 8 feet long and 100 ℔ in weight. The kawai (*D. aculeata*) is also a very fine esculent, and there are several wild species. The yaka, which also grows wild, is a papilionaceous creeper (*Pachyrhizus angulatus*), with roots 6 to 8 feet long and as thick as a man's thigh; it is also much valued for its fibre. The taro or dalo (*Colocasia esculenta*) is grown in ditches, by streams, or on irrigated ground; and there are other aroideous plants growing wild, with huge edible corms. The natives use no grain or pulse, but make a kind of bread (*mandrai*) from the above roots, as well as from the banana (which is the best), the bread-fruit, the ivi, the kavika, the arrow-root (*Tacca pinnatifida* and *T. sativa*), and in times of scarcity the mangrove. This bread is made by burying the materials for months, till the mass is thoroughly fermented and homogeneous, when it is dug up and cooked by baking or steaming. This simple process, applicable to such a variety of substances, is a valuable security against famine.

The islands are well suited to sugar, maize, coffee, cotton (which here becomes a perennial several feet high), tobacco, manilla, india-rubber, etc.

Animals.—Besides the dog and the pig, which (with the domestic fowl) must have been introduced into the Pacific islands in very early ages, the only land Mammalia are a rat and five species of bats. Insects are numerous, but the species few. Of 41 species of land birds, 17, Mr. Wallace says, are characteristic of the Australian region, 9 peculiarly Polynesian, and 15 belong to wide-spread genera. Birds of prey are few; the parrot and pigeon tribes are better represented; of 15 aquatic species only one is peculiar. Fishes, of an Indo-Malay type, are numerous and varied; Mollusca, especially marine, and Crustaceæ are also very numerous. These three form an important element in the food supply.

Exports.—Numbers of cocoa-nuts have been planted, and the export of copra (the dried kernel of the nut) is rapidly increasing. The chief exports in 1876 were—copra £41,900, sugar £9036, maize £8465,—which are all on the increase; cotton £11,922, and bêche-de-mer £2491, which have decreased; coir £2727, pearl-shell, and arrow-root. The value of exports from Levuka was £80,890, of imports £112,806. The customs returns were estimated at £15,000; the native land revenue was assessed at £22,000. The revenue of 1878 is estimated at £60,000.

People.—The Fijian character was till lately proverbial for every savage abomination. Cannibalism, if fenced round at one time by religious sanctions, had degenerated to a morbid craving recklessly indulged whenever possible. Shipwrecked or helpless strangers were nearly always killed and eaten. Widows were strangled at the death of their husbands, slaves killed at the death of their masters; victims were slain in numbers at the building of a house or of a canoe, or at the visits of embassies from other tribes. The lives of individuals were always subject to the caprices of the chiefs. In the atmosphere of suspicion and treachery thus engendered few virtues could be developed. Yet the people were always hospitable, open-handed, and remarkably polite. They themselves attribute to affection the practice of killing their sick or aged relations. They are sensitive, proud, vindictive, boastful, cleanly in their houses, cookery, etc., with good conversational and reasoning powers, much sense of humor, tact, and perception of character. Their code of social etiquette is minute and elaborate, and the gradations of rank well-marked These are—1, chiefs, greater and lesser; 2, priests; 3, *Mata ni Vanua* (lit., eyes of the land), employés, messengers, or counsellors; 4, distinguished warriors of low birth; 5, common people; 6, slaves.

Political Institutions.—The family is the unit of political society. The families are grouped in townships or otherwise (*qali*) under the lesser chiefs, who again owe allegiance to the supreme chief of the *matanitu* or tribe. The chiefs are a real aristocracy, excelling the people in physique, skill, intellect, and acquirements of all sorts; and the reverence felt for them, now gradually diminishing, was very great, and had something of a religious character. All that a man had belonged to his chief. On the other hand, the chief's property practically belonged to his people, and they were as ready to give as to take. In a time of famine, a chief would declare the contents of the plantations to be common property. A system of feudal service-tenures (*lala*) is the institution on which their social and political fabric mainly depended. It allowed the chief to call for the labor of any district, and to employ it in planting, house or canoe building, supplying food on the occasion of another chief's visit, etc. This power was often used with much discernment; thus an unpopular chief would redeem his character by calling for some customary service and rewarding it liberally, or a district would be called on to supply labor or produce as a punishment. The privilege might of course be abused by needy or unscrupulous chiefs, though they generally deferred somewhat to public opinion; it has now, with similar customary exactions of cloth, mats, salt, pottery, etc., been reduced within definite limits. An allied custom, *solevu*, enabled a district in want of any particular article to call on its neighbors to supply it, giving labor or something else in exchange. Although, then, the chief is lord of the soil, the inferior chiefs and individual families have equally distinct rights in it, subject to payment of certain dues; and the idea of permanent alienation of land by purchase was never perhaps clearly realized.[1] Another curious custom was that of *vasu* (lit., nephew). The son of a chief by a woman of rank had almost unlimited rights over the property of his mother's family, or of her people.

War.—In time of war the chief claimed absolute control over life and property. Warfare was carried on with many courteous formalities, and considerable skill was shown in the fortifications. There were well-defined degrees of dependence among the different tribes or districts: the first of these, *bati*, is an alliance between two nearly equal tribes, but implying a sort of inferiority on one side, acknowledged by military service; the second, *qali*, implies greater subjection, and payment of tribute. Thus A, being bati to B, might hold C in qali, in which case C was also reckoned subject to B, or might be protected by B for political purposes.

Religion. — The people are now almost all Christians. Their former creed, which had much in common with the Polynesian, included a belief in a future existence, and in two classes of gods,—the first immortal, of whom Ndengei is the greatest, said to exist eternally in the form of a serpent, but troubling himself little with human or other affairs, and the others had usually only a local recognition. The second rank (who, though far above mortals, are subject to their passions, and even to death) comprised the spirits of chiefs, heroes, and other ancestors. The gods entered and spoke through their priests, who thus pronounced on the issue of every enterprise, but they were not represented by idols; certain groves and trees were held sacred, and stones which suggest phallic associations. The priesthood usually was hereditary, and its influence great, and it had generally a good understanding with the chief. The institution of Tabu existed in full force. The mburé or temple was also the council-chamber and place of assemblage for various purposes.

Customs.—They have various games and amusements, dancing, story-telling, and songs being especially popular. Their poetry has well-defined metres, and a sort of rhyme. Their music is rude, and is said to be always in the major key. The excellence of their pottery favors a good and varied cuisine, and they have great and elaborate feasts; the preparations are sometimes made months in advance, and enormous waste results from them. Mourning is expressed by fasting, by shaving the head and face, or by cutting off the little finger. This last is sometimes done at the death of a rich man in the hope that his family will reward the compliment; sometimes it is done vicariously, as when the chief cuts off the little finger of his dependants in regret or in atonement for the death of another. Only the women are tattooed.[2]

Houses.—The houses, of which the framework is timber and the rest lattice and thatch, are ingeniously constructed, with great taste in ornamentation, and are well furnished with mats, mosquito-curtains, baskets, fans, nets, and cooking and other utensils.

Population.—The population forty years ago was about 200,000; it has since rapidly diminished, owing at first to the evils above described (aggravated probably by contact with the vicious European element), and afterwards to that fatal languor which so often accompanies the introduction of civilization, the deaths now outnumbering the births. Before the annexation to Britain (1874) there were about 140,000, but 40,000 fell victims to measles soon after. This diminution might perhaps be combated by the encouragement of their old athletic sports under an enlightened Christianity. The exact ethnological position of the people is a problem. They occupy the extreme east limits of Papuan territory, but far surpass the pure examples of that race, combining their dark color, harsh, hirsute skin, crisp hair,[3] and muscular limbs with the handsome features of the brown Polynesian race. They are tall and well-proportioned, the average physical development being much higher than our own. The features are strongly marked, but not unpleasant, the eyes deep-set, the beard thick and bushy. The chiefs are fairer, much better looking, and of a less negroid cast of face than the people. This negroid type is especially marked on the west coasts, and still more in the interior of Viti Levu. Many other characteristics of both races are found,—*e. g.*, the quick intellect of the fairer, and the savagery and suspicion of the dark; they wear a minimum of covering, but, unlike the Melanesians, are strictly decent, while they are more moral than the Polynesians. A partial circumcision is practised, which is exceptional with the Melanesians, nor have these usually an elaborate political and social system like that of Fiji. The status of the women is also somewhat better,—those of the upper class having considerable freedom and influence. Till taught by the Tongans they were, like other Melanesians, timid sailors. The prevalence of one language (though in several dialects) contrasts with the endless variety among the Melanesians. It is copious, flexible, vigorous, — fundamentally Melanesian, but largely modified in vocabulary and even in structure by the Polynesian. It has been argued from, among other considerations, the number of places with Tongan names, and from certain old Tongan traditions, that the ancestors of that people, in their migration from the west, were, after remaining a long time in Fiji, finally expelled thence by the aboriginal and darker race. Fijian traditions, however, point to no such movement, only asserting the greater unity of the race in former times, and placing even the creation of man, the scene of the deluge, and of the building of a tower of Babel, on Fijian soil. At all events, the Fijian is a well-established race, and the fusion of the elements which produced it certainly dates from a remote past.

If less readily amenable to civilizing influences than their neighbors to the eastward, they show greater force of character and ingenuity. Possessing the arts of both races, they practise them with greater skill than either. They understand the principle of division of labor and production, and thus of commerce. They are skilful cultivators and good boat-builders, the carpenters being an hereditary caste; there are also tribes of fishermen and sailors; their mats, baskets, nets, cordage, and other fabrics are substantial and tasteful; their pottery, made—like much of the above—by women, is far superior to any other in the South Seas, but, with many other native manufactures, is being supplanted by European articles.

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[1] Of the 4½ million acres in Fiji, 854,956 acres, comprising all the best land, were purchased by whites before the annexation; but all the titles have not yet (1878) been confirmed.

[2] It will be understood that in the present state of transition some of the curious polity and customs here recorded are becoming obsolete.

[3] The elaborate mop into which the hair is trained (as among certain tribes in East Africa and elsewhere) has led to the belief that its peculiar appearance is due to irregular aggregations of the follicles, but this has been disproved.

History.—A few islands in the N.E. of the group were first seen by Tasman in 1643. The southernmost of the group, Turtle Island, was discovered by Cook in 1773. Bligh visited them in 1789, and Captain Wilson of the "Duff" in 1797. In 1827 D'Urville in the "Astrolabe" surveyed them much more accurately, but the first thorough survey was that of the United States exploring expedition in 1840.

Up to this time, owing to the evil reputation of the islanders, European intercourse was very limited. About the year 1804 some escaped convicts from Australia and runaway sailors established themselves around the east part of Viti Levu, and by lending their services to the neighboring chiefs probably led to their preponderance over the rest of the group. Na Ulivau, chief of the small island of Mbau, established before his death in 1829 a sort of supremacy, which was extended by his brother Tanoa, and by Tanoa's son, the well-known Thakombau, a ruler of considerable capacity. In his time, however, difficulties thickened. The Tongans, a Polynesian people 250 miles to the S.E. (see FRIENDLY ISLANDS), who had long frequented Fiji (especially for canoe-building, their own islands being deficient in timber), now came in larger numbers, led by an able and ambitious chief, Maafu, who, by adroitly taking part in Fijian quarrels, made himself chief in the Windward group, threatening Thakombau's supremacy. He was harassed, too, by an arbitrary demand for £9000 from the American Government, for alleged injuries to their consul. Several chiefs who disputed his authority were crushed by the aid of King George of Tonga, who (1855) had opportunely arrived on a visit; but he afterwards, taking some offence, demanded £12,000 for his services. At last Thakombau, disappointed in the hope that his acceptance (1854) of Christianity would improve his position, offered (1858) the sovereignty to England, with the fee simple of 100,000 acres, on condition of her paying the American claims. Colonel Smythe, R. A., was sent out to report on the question, and decided against annexation, but advised that the British consul should be invested with full magisterial powers over his countrymen, a step which would have averted much subsequent difficulty.

Meanwhile Dr. Seeman's favorable report on the capabilities of the islands, followed by a time of depression in Australia and New Zealand, led to a rapid increase of settlers—from 200 in 1860 to 1800 in 1869. This produced fresh complications, and an increasing desire among the respectable settlers for a competent civil and criminal jurisdiction. Attempts were made at self-government, and the sovereignty was again offered, conditionally, to England, and to the United States. Finally, in 1871, a "constitutional government" was formed by certain Englishmen under King Thakombau; but this, after incurring heavy debt, and promoting the welfare of neither whites nor natives, came after three years to a dead lock, and the British Government felt obliged, in the interest of all parties, to accept the unconditional cession now offered. It had besides long been thought desirable to possess a station on the route between Australia and Panama; it was also felt that the Polynesian labor traffic, the abuses in which had caused much indignation, could only be effectually regulated from a point so contiguous to the recruiting field, and where that labor was extensively employed. To this end the governor of Fiji is also "High Commissioner for the Western Pacific." Native laws, customs, and polity have been tenderly handled, and utilized, as far as possible, under the new rule. The chiefs are held responsible for good order, and for payment of the revenue. Certain higher chiefs, called "Roko Tuis," receive salaries, with executive and magisterial powers, assisted in the latter function by a large number of native subordinates, "Bulis," all under the eye of a very few European stipendiary magistrates. The employment of native labor is under strict regulations. The revenue is raised in conformity with native ideas, each district being assessed yearly to furnish certain supplies in kind, which are disposed of by tender. The white settlers at the end of 1876 numbered 1569.

The labors of the Wesleyan missionaries must always have a prominent place in any history of Fiji. They came from Tonga in 1835, and naturally settled first in the Windward Islands, where the Tongan element, already familiar to them, preponderated. They perhaps identified themselves too closely with their Tongan friends, whose dissolute, lawless, tyrannical conduct led to much mischief; but it should not be forgotten that their position was a difficult one; their services to humanity were certainly great, and it was mainly through their efforts that the heathen abominations so recently in full vigor have become a thing of the past.

Bibliography.—*The United States Exploring Expedition*, by Wilkes and Hale, 1838–42; *Viti; an account of a Government Mission in the Vitian* or *Fijian Islands*, 1860–61, by Seemen; Williams, *Fiji and the Fijians*, and Calvert, *Missionary Labors among the Cannibals;* Meinicke, *Die Inselm des Stillen Oceans;* Von der Gabelentz, *Die Melanesischen Sprachen;* Erskine, *Journal of a Cruise in the Pacific;* Smythe, *Ten Months in the Fiji Islands;* Findlay's *Sailing Directory for the Pacific Ocean;* Pritchard, *Polynesian Reminiscences;* Parliamentary papers. (C. T.)

FILANGIERI, CARLO (1783–1867), an Italian general, son of the economist Gaetano Filangieri, was born at Naples in 1783, not long before his father's death. In 1799 he came to France, and, through the influence of the first consul, was admitted to the prytanée, then the training school for young officers, where he remained for the usual period of two years. Entering the French army, he was promoted to the rank of captain on the field of Austerlitz. He afterwards connected himself with the Neapolitan army which he accompanied to Spain (1808), where he distinguished himself by a brilliant, though not always considerate, valor. He fought many duels, one with General Franceschi, whom he killed. In 1815 he was created general by Murat, and decorated with the order of the Deux-Siciles, after being severely wounded by the Austrians while reconnoitring on the Tanaro. On the restoration of the Bourbons to the throne of Naples, Filangieri opposed the constitution of 1820, and showed himself a most decided partisan of absolute power. He, however, incurred the displeasure of Ferdinand I.; but on the accession of Ferdinand II., he was placed at the head of the artillery and engineers. In 1848 he powerfully helped to check the revolutionary movement, by taking Messina after a terrible bombardment which lasted four days; and six months after, when the armistice imposed by England and France expired, he completed the submission of Sicily, of which he was appointed governor-general with dictatorial powers. As a reward for his services he received the title of duke of Taormina. He died in 1867.

FILANGIERI, GAETANO (1752–1788), an eminent Italian publicist, was born at Naples on the 18th of August, 1752. He was the third son of Cæsar prince of Arianiello, and through his mother he was connected with the ducal house of Fragnito. Gaetano was from his infancy destined for the profession of arms; when only seven years of age he received a military appointment, and at fourteen he began actual service. His early years gave no promise of future distinction; he seems originally to have manifested a positive dislike for the classics, while his interest in the exact sciences, it is said, was first awakened at a comparatively mature age by a trivial circumstance. His brother's tutor had made a mistake in the solution of a mathematical problem; Gaetano had been acute enough to discover and rectify the error. From that day his great intellectual powers began to develop rapidly, and such was his diligence that, at twenty years of age, besides being well grounded in mathematical science, he had acquired a competent knowledge of Latin and Greek, of ancient and modern history, as well as of the principles of law, and, moreover, had composed a couple of essays, one on "Educational Reform" and another on the "Morals of Princes." Meanwhile he had quitted the military service, and, yielding to the wishes of his friends rather than to his own inclinations, had entered on the profession of the law. At the bar his knowledge and eloquence soon secured his success, and special circumstances still further helped his advancement. In the year 1774 King Charles III. of Naples, at the instance of his minister Tanucci, had issued a much-needed ordinance for the reform of abuses in the administration of justice. Although this reform had been generally welcomed, it had excited the murmurs of the bar. Filangieri now became the advocate of the court, and published a defence of the royal decree founded upon the most enlarged views of law and equity. The extensive knowledge and matured judgment displayed in this performance called forth the warm commendation of Tanucci, who encouraged its author to pursue the course in which he had already acquired so much distinction. Through this influence and that of his uncle the archbishop of Palermo he received, in 1777, several honorable appointments at court; but his residence there neither broke in upon his regular habits of life, nor interrupted the course of his studies; nor did he allow it to interfere with the composition of the great work, *La Scienza della Legislazione*, on which he was engaged, and to which, rather than to practice at the bar, he had all along been devoting his chief attention. The first and second books, containing respectively an exposition of the rules on which legislation in general ought to proceed, and a discussion of political and economic laws in particular, appeared at Naples, 1780. Its success was great and immediate. Not only in Italy, but throughout Europe at large, the author forthwith took rank with the most celebrated publicists,—with his own countrymen Gravina, Vico, and Beccaria, and with the illustrious

Montesquieu. Although in the course of his observations he had found it necessary to point out many faults committed by his own Government, so skilfully had he discharged the delicate task of stating obnoxious truths without giving offence to those in power that he was promoted by the king to a commandery in the royal order of Constantine. In 1783 he was married to Caroline von Frendel, an Hungarian lady; and in order that he might the more fully enjoy domestic happiness, and at the same time have leisure for the composition of his work, on which he became every day more intent, he, with the consent of the king, resigned all his military appointments and his offices at court, and retired to a country seat at Cava, some twenty miles from Naples. In the same year he published the third book of his *Scienza*, relating entirely to the principles of criminal jurisprudence. Even his earlier volumes had not failed to rouse the antipathies of an interested and influential class; but in this certain suggestions which he had made as to the need for reform in the Roman Catholic Church called forth the censure of the ecclesiastical tribunals, and his book was condemned by the congregation of the Index in 1784. In the following year he nevertheless published three additional volumes, dealing with education and morals, these forming the fourth book of his great work. He was proceeding with the preparation of the remaining three books, but his health was now considerably impaired, owing to an excess of application, so that composition advanced but slowly; and other interruptions soon followed. In 1787 the new king, Ferdinand IV., summoned him to Naples to assist in the council of finance; and there for a time he was wholly engrossed with this important public business. But severe domestic misfortunes, combined with over-work, soon compelled his withdrawal from office once more. He had just finished the first part of his fifth book, in which he treats of the different systems of religion which preceded Christianity, when he died on the 21st of July, 1788. Of the second part of the same book he had only made a rude sketch, in which were noted down the principal subjects of discussion,—such as the advantages of Christianity, and the dangers of superstition; the inconveniences of not distinguishing the spiritual from the temporal power; the evils of an ignorant, venal, excessively wealthy clergy. He was then to have considered the principles of ecclesiastical jurisprudence; and a chapter on toleration was to have completed the book. In the sixth book he proposed to treat of the laws relating to property; and in the seventh and last, of those regarding the patria potestas and the government of families. It is much to be regretted that the author was not spared to complete his great work. Though unfinished, it has exercised considerable influence on the thought and feeling of Europe, particularly in Italy, where, at the time of its publication, the feudal system of legislation was still in full force. In some portions, particularly in the chapters on criminal law, it is not even now out of date. Filangieri had also other important works in contemplation when he died. One, of which he had written a short fragment, was to have been entitled *Nuova Scienza delle Scienze;* another was to have contained a system of universal history.

His great work, *La Scienza della Legislazione*, has gone through many editions, and has been translated into most of the languages of Europe. The best Italian edition is perhaps that of Livorno, in 5 vols. 8vo (1807). The Milan edition (1822) contains the *Opusculi scelti* and a life by Donato Tommasi. A French translation, by Gallois, appeared in Paris in 7 vols. 8vo (1786–98); it was republished in 1822–24, with the addition of the *Opuscules* and notes by Benjamin Constant. *The Science of Legislation* was translated into English by Sir R. Clayton (London, 1806).

FILBERT. See HAZEL.

FILE, a bar of steel having sharp teeth on its surface, and used for abrading or smoothing hard substances. Some uncivilized tribes polish their weapons with such things as rough stones, pieces of shark skin, or fishes' teeth. The operation of filing is recorded in 1 Sam. xiii. 21; and, among other facts, the similarity of the name for the filing instrument among various European peoples points to an early practice of the art. A file differs from a *rasp* (which is chiefly used for working wood, horn, and the like) in having its teeth cut with a chisel whose straight edge extends across its surface, while the teeth of the rasp are formed by solitary indentations of a pointed chisel. According to the form of their teeth, files may be *single-cut* or *double-cut;* the former have only one set of parallel ridges (either at right angles or at some other angle with the length); the latter (and more common) have a second set cut at an angle with the first. The double-cut file presents sharp angles to the filed surface, and is better suited for hard metals. Files are also classed according to fineness of teeth, being known (in order of increasing fineness) as *rough, bastard, second-cut, smooth,* and, *superfine* or *dead smooth.* The shapes of files present almost endless varieties. Common forms are—the *flat* file, of parallelogram section, with uniform breadth and thickness, or tapering, or "bellied;" the *four-square* file, of square section, sometimes with one side "safe," or left smooth; the so-called *three-square* file, having its cross section an equilateral triangle, the *half-round* file, a segment of a circle, the *round* or *rat-tail* file, a circle; these are generally tapered. The *float* file is like the *flat*, but single-cut. There are many others. Files vary in length from three-quarters of an inch (watchmakers') to two or three feet and upwards (engineers'). The length is reckoned exclusively of the spike or tang which enters the handle. Most files are tapered; the *blunt* are nearly parallel, with larger section near the middle; a few are parallel. The *rifflers* of sculptors and a few other files are curvilinear in their central line.

Cast-steel is the material chiefly used for files, though the larger and rougher varieties are sometimes made from blister-steel. In manufacture, the blanks are forged from bars that have been tilted or rolled as nearly as possible to the sections required. They are then annealed with great care, and when sufficiently softened are taken out, straightened, if necessary, with hand hammers, and then rendered clean and accurate in form by filing or grinding. They are now ready for cutting. In this process, as performed by hand, the cutter sits before a square stake or anvil, on which the blank, slightly greased, is held (having its tang towards him) by means of two leather straps passed round its ends, and held fast below, one by each foot. He holds in his left hand a short chisel (the edge of which always exceeds the width of the file), placing it on the blank with a slight inclination from him, and beginning near the further end. He strikes the chisel sharply with a hammer, an indentation is thus made, and the steel, slightly thrown up on the side next the tang, forms a ridge. The chisel is then transferred to the uncut surface, and slid from the operator till it reaches the ridge just made; thus the position of the next cut is determined; the chisel is again struck, and so on. (The end part of the file is dealt with separately.) The workman seeks to give his blows as uniformly as possible. Sixty to eighty cuts are made in one minute. After finishing the first *course* of cuts, he proceeds, if the file is to be double-cut, to make the second course, the cuts of the latter being generally somewhat finer. Thus the surface is covered with teeth inclined towards the point of the file. If the file is flat and is to be cut on the other side, it is turned over, and a thin plate of pewter placed below it to protect the teeth. Triangular and other files are supported in grooves in lead. In cutting round and half-round files, a straight chisel is applied as tangent to the curve. The round face of a half-round file requires eight, ten, or more courses to complete it.

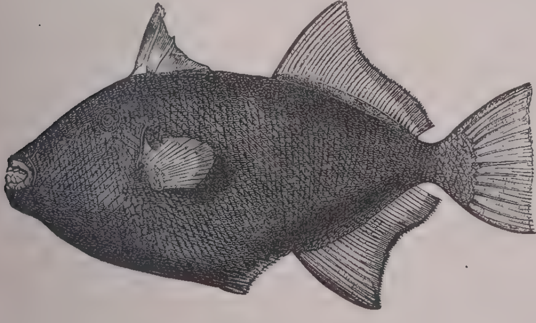
The file is next hardened. Being first covered with a paste to protect the teeth from the direct action of fire, etc. (*e.g.*, passed through beer-grounds to make it sticky, then through a mixture of common salt with roasted and pounded cow's hoof), it is heated to an even red heat, and then suddenly cooled by plunging in cold water or brine. It is removed before cooling throughout, that it may be straightened if necessary (which is done by pressure). Then it is cooled in oil. The tang is next submitted to a softening process, and the file, after being wiped, and the teeth brushed clean, is ready for fixing into the handle and for use.

In England files are chiefly made in Sheffield and Warrington, those of the latter place being generally known as Lancashire files. It is remarkable that while many other operations that appear more difficult than file-cutting are now effected by machinery, and while numerous file-cutting machines have been invented, the work continues (in England) to be largely done by hand. This is perhaps partly due to strong opposition on the part of operatives to introduction of machinery, and also to a foolish prejudice in favor of hand-cut files (machine-cut files, indeed, are not unfrequently sold as hand-cut), but probably also to the problem of cutting files by machinery being really somewhat difficult. In most of the machines invented for that purpose, the idea has been to construct an iron arm and hand to hold the chisel, and a hammer to strike the blow, and so to imitate, as closely as possible, the manual process. Bernot's machine is an improvement on this. In it the blow is given by pressure of a flat steel spring pressing on the top of a vertical slide, at the lower end of which the chisel is firmly fixed. The slide is acted on by a cam making about one thousand revolutions a minute, and the chisel consequently strikes that number of blows per minute. The vibration is thus lessened. The history of file-making by machinery in America (where it has been extensively practised) seems to indicate that much of the failure experienced has been due to the fatal defect in the machinery used, of producing extreme regularity in the teeth. This gives rise to complaints by artisans about files "running in grooves," "chattering," etc. The grooves produced by the file (if double-cut especially) at the beginning of its movement are deepened as it is moved further. With irregular teeth, on the other hand, such as are found in all hand-made files, the grooves made in the first instance have their sides cut away as the file is advanced. The Nicholson File Company, in Providence, Rhode Island, have used, with large and increasing success a machine which imitates, to some extent, this irregular result of the hand process, cutting the files so that no two spaces are found exactly alike in the entire length.

The filing of a flat surface perfectly true is the test of a good filer; and this is no easy matter to the beginner. The piece to be operated upon is generally fixed about the level of the elbow, the operator standing, and, except in the case of small files, grasping the file with both hands, the handle with the right, the further end with the left. The great point is to be able to move the file forward with pressure in horizontal straight lines; from the tendency of the hands to move in arcs of circles, the heel and point of the file are apt to be alternately raised. This is partially compensated by the bellied form given to many files (which also counteracts the frequent warping effect of the hardening process, by which one side of a flat file may be rendered concave and useless). In bringing back the file for the next thrust it is nearly lifted off the work. Further, much delicacy and skill are required in adapting the pressure and velocity, ascertaining if foreign matters or filings remain interposed between the file and the work, etc. Files can be cleaned with a piece of the so-called *cotton-card* (used in combing cotton wool) nailed to a piece of wood. In *draw-filing*, which is sometimes resorted to to give a neat finish, the file is drawn sideways to and fro over the work. New files are generally used for a time on brass or cast-iron, and when partially worn they are still available for filing wrought iron and steel.

An interesting application of the sandblast to sharpening the teeth of files has recently been made by Mr. Tilghman. (A. B. M.)

FILE-FISH and **Trigger-fish** are names given to fishes of the genus *Balistes* (and *Monacanthus*) inhabiting all tropical and subtropical seas. Their body is compressed and not covered with ordinary scales, but with small juxtaposed scutes. Their other principal characteristics consist in the structure of their first dorsal fin (which consists of three spines) and in their peculiar dentition. The first of the three dorsal spines is very strong, roughened in front like a file, and hollowed out behind to receive the second much smaller spine, which, besides, has a projection in front, at its base, fitting into a notch of the first. Thus these two spines can only be raised or depressed simultaneously, in such a manner that the first cannot be forced down unless the second has been previously depressed. The latter has been compared to a trigger, hence the name of *Trigger-fish*. Also the generic name *Balistes* and the Italian name of "Pesce balistra" refer to this structure. Both jaws are armed with eight strong incisor-like and sometimes pointed teeth, by which these fishes are enabled, not only to break off pieces of madrepores and other corals on which they feed, but also to chisel a hole into the hard shells of Mollusca, in order to extract the soft parts. In this way they destroy an immense number of mollusks, and become most injurious to the pearl-fisheries. The gradual failure of those fisheries in Ceylon has been ascribed to this cause, although evidently other agencies must have been at work at the same time. The *Monacanthi* are distinguished from the *Balistes* in having only one dorsal spine and a velvety covering of the skin. Some 30 different species are known of *Balistes*, and about 50 of *Monacanthus*. Two species (*B. maculatus* and *capriscus*), common in the Atlantic, sometimes wander to the British coasts.



Balistes vidua.

FILELFO, Francesco (1398–1481), was born in 1398 at Tolentino, in the March of Ancona. When he appeared upon the scene of human life, Petrarch and the students of Florence had already brought the first act in the recovery of classic culture to conclusion. They had created an eager appetite for the antique, had disinterred many important Roman authors, and had freed Latin scholarship to some extent from the barbarism of the Middle Ages. Filelfo was destined to carry on their work in the field of Latin literature, and to be an important agent in the still unaccomplished recovery of Greek culture. His earliest studies in grammer, rhetoric, and the Latin language were conducted at Padua, where he acquired so great a reputation for learning that in 1417 he was invited to teach eloquence and moral philosophy at Venice. According to the custom of that age in Italy, it now became his duty to explain the language, and to illustrate the beauties of the principal Latin authors, Cicero and Virgil being considered the chief masters of moral science and of elegant diction. Filelfo made his mark at once in Venice. He was admitted to the society of the first scholars and the most eminent nobles of that city; and in 1419 he received an appointment from the state, which enabled him to reside as secretary to the consul-general of the Venetians in Constantinople. This appointment was not only honorable to Filelfo as a man of trust and general ability, but it also gave him the opportunity of acquiring the most coveted of all possessions at that moment for a scholar—a knowledge of the Greek language. Immediately after his arrival in Constantinople, Filelfo placed himself under the tuition of John Chrysoloras, whose name was already well known in Italy as brother of Manuel, the first Greek to profess the literature of his ancestors in Florence. At the recommendation of Chrysoloras he was employed in several diplomatic missions by the emperor John Palæologus. Before very long the friendship between Filelfo and his tutor was cemented by the marriage of the former to Theodora, the daughter of John Chrysoloras. He had now acquired a thorough knowledge of the Greek language, and had formed a large collection of Greek manuscripts. There was no reason why he should not return to his native country. Accordingly, in 1427 he accepted an invitation from the republic of Venice, and set sail for Italy, intending to resume his professorial career. From this time forward until the date of his death, Filelfo's history consists of a record of the various towns in which he lectured, the masters whom he served, the books he wrote, the authors he illustrated, the friendships he contracted, and the wars he waged with rival scholars. He was a man of vast physical energy, of inexhaustible mental activity, of quick passions, and violent appetites; vain, restless, greedy of gold and pleasure and fame; unable to stay quiet in one place, and perpetually engaged in quarrels with his compeers.

When Filelfo arrived at Venice with his family in 1427, he found that the city had almost been emptied by the plague, and that his scholars would be few. He therefore removed to Bologna; but here also he was met with drawbacks. The city was too much disturbed with political dissensions to attend to him; so Filelfo crossed the Apennines and settled in Florence. At Florence began one of the most brilliant and eventful periods of his life. During the week he lectured to large audiences of young and old on the principal Greek and Latin authors, and on Sundays he explained Dante to the people in the Duomo. In addition to these labors of the chair, he found time to translate portions of Aristotle, Plutarch, Xenophon, and Lysias from the Greek. Nor was he dead to the claims of society. At first he seems to have lived with the Florentine scholars on tolerably good terms; but his temper was so arrogant that Cosimo de' Medici's friends were not long able to put up with him. Filelfo hereupon broke out into open and violent animosity; and when Cosimo was exiled by the Albizzi party in 1433, he urged the signoria of Florence to pronounce upon him the sentence of death. On the return of Cosimo to Florence, Filelfo's position in that city was no longer tenable. His life, he asserted, had been already once attempted by a cut-throat in the pay of the Medici; and now he readily accepted an invitation from the state of Siena. In Siena, however, he was not destined to remain more than four years. His fame as a professor had grown great in Italy, and he daily received tempting offers from princes and republics. The most alluring of these, made him by the duke of Milan, Filippo Maria Visconti, he decided on accepting; and in 1440 he was received with honor by his new master in the capital of Lombardy.

Filelfo's life at Milan curiously illustrates the multifarious importance of the scholars of that age in Italy. It was his duty to celebrate his princely patrons in panegyrics and epics, to abuse their enemies in libels and invectives, to salute them with encomiastic odes on their birthdays, and to compose poems on their favorite themes. For their courtiers he wrote epithalamial and funeral orations; ambassadors and visitors from foreign states he greeted with the rhetorical lucubrations then so much in vogue. The students of the university he taught in daily lectures, passing in review the weightiest and lightest authors of antiquity, and pouring forth a flood of miscellaneous erudition. Not satisfied with these outlets for his mental energy, Filelfo went on translating from the Greek, and prosecuted a paper warfare with his enemies in Florence. He wrote, moreover, political pamphlets on the great events of Italian history; and when Constantinople was taken by the Turks, he procured the liberation of his wife's mother by a message addressed in his own name to the sultan. In addition to a fixed stipend of some 700 golden florins yearly, he was continually in receipt of special payments for the orations and poems he produced; so that, had he been a man of frugal habits or of moderate economy, he might have amassed a considerable fortune. As it was, he spent his money as fast as he received it, living in a style of splendor ill befitting a simple scholar, and indulging his taste for pleasure in more than questionable amusements. In consequence of this prodigality, he was always poor. His letters and his poems abound in impudent demands for money from patrons, some of them couched in language of the lowest adulation, and others savoring of literary brigandage.

During the second year of his Milanese residence Filelfo lost his first wife, Theodora. He soon married again; and this time he chose for his bride a young lady of good Lombard family, called Orsina Osnaga. When she died, he took in wedlock for the third time a woman of Lombard birth, Laura Magiolini. To all his three wives, in spite of numerous infidelities, he seems to have been warmly attached; and this is perhaps the best trait in a character otherwise more remarkable for arrogance and heat than for any amiable qualities.

On the death of Filippo Maria Visconti, Filelfo, after a short hesitation, transferred his allegiance to Francesco Sforza, the new duke of Milan; and in order to curry favor with this parvenu, he began his ponderous epic, the *Sforziad*, of which 12,800 lines were written, but which was never published. When Francesco Sforza died, Filelfo turned his thoughts towards Rome. He was now an old man of seventy-seven years, honored with the friendship of princes, recognized as the most distinguished of Italian humanists, courted by pontiffs, and decorated with the laurel wreath and the order of knighthood by kings. Crossing the Apennines and passing through Florence, he reached Rome in the second week of 1475. The terrible Sixtus IV. now ruled in the Vatican; and from this pope Filelfo had received an invitation to occupy the chair of rhetoric with good emoluments. At first he was vastly pleased with the city and court of Rome; but his satisfaction ere long turned to discontent, and he gave vent to his ill humor in a venomous satire on the pope's treasurer, Milliardo Cicala. Sixtus himself soon fell under the ban of his displeasure; and when a year had passed, he left Rome never to return. Filelfo reached Milan to find that his wife had died of the plague in his absence, and was already buried. His own death followed speedily. For some time past he had been desirous of displaying his abilities and adding to his fame in Florence. Years had healed the breach between him and the Medicean family; and on the occasion of the Pazzi conspiracy against the life of Lorenzo de' Medici, he had sent violent letters of abuse to his papal patron Sixtus, denouncing his participation in a plot so dangerous to the security of Italy. Lorenzo now invited him to profess Greek at Florence, and thither Filelfo journeyed in 1481. But two weeks after his arrival he succumbed to dysentery, and was buried at the age of eighty-three in the church of the Annunziata.

Filelfo deserves commemoration among the greatest humanists of the Italian Renaissance, not for the beauty of his style, not for the elevation of his genius, not for the accuracy of his learning, but for his energy, and for his complete adaptation to the times in which he lived. His erudition was large but ill-digested; his knowledge of the ancient authors, if extensive, was superficial; his style was vulgar; he had no brilliancy of imagination, no pungency of epigram, no grandeur of rhetoric. Therefore he has left nothing to posterity which the world would not very willingly let die. But in his own days he did excellent service to learning by his untiring activity, and by the facility with which he used his stores of knowledge. It was an age of accumulation and preparation, when the world was still amassing and cataloguing the fragments rescued from the wrecks of Greece and Rome. Men had to receive the very rudiments of culture before they could appreciate its niceties. And in this work of collection and instruction Filelfo excelled, passing rapidly from place to place, stirring up the zeal for learning by the passion of his own enthusiastic temperament, and acting as a pioneer for men like Poliziano and Erasmus. All that is worth knowing about Filelfo is contained in Rosmini's admirable *Vita di Filelfo*, Milan, 1808; but the student may also consult Roscoe's *Life of Lorenzo de' Medici*, Vespasiano's *Vite di Uomini Illustri*, and Burckhardt's *Italian Renaissance*, with profit. (J. A. S.)

FILIBUSTER, a name first given to the buccaneers, a band of piratical adventurers who maintained themselves chiefly in the Caribbean seas during the 17th century (see BUCCANEER). The origin of the term has been explained in two ways,—some deriving it from the English word *flyboat*, French *flibot*, Spanish *flibote*, a name given to a small vessel not exceeding 100 tons, which, on account of its sailing qualities, was much used by pirates, while others make it synonymous with the Dutch *vry buiter*, German *freibeuter*, English *freebooter*, the word changing first into *fribustier*, and then into French *flibustier*, Spanish *filibustero*. *Flibustier* has passed into the French language and *filibustero* into the Spanish language as a general name for a pirate, and the term *filibuster* was revived in America to designate those adventurers who, after the termination of the war between Mexico and the United States, organized expeditions within the United States against the Spanish West Indies.

FILICAIA, VINCENZO DA (1642–1707), sprung from an ancient and noble family of Florence, was born in that city December 30, 1642. From an incidental notice in one of his letters, stating the amount of house rent paid during his childhood, his parents must have been in easy circumstances, and the supposition is confirmed by the fact that he enjoyed all the advantages of a liberal education, first under the Jesuits of Florence, and then in the university of Pisa. At Pisa his mind became stored, not only with the results of patient study in various branches of letters, but with the great historical associations linked with the former glory of the Pisan republic, and with one remarkable institution of which Pisa was the seat. To the tourist who now visits

Pisa the banners and emblems of the order of St. Stephen are mere matter of curiosity, but they had a serious significance two hundred years ago to the young Tuscan, who knew that these naval crusaders formed the main defence of his country and commerce against the Turkish, Algerine, and Tunisian corsairs. After a five years' residence in Pisa he returned to Florence, where he married Anna, daughter of the senator and marquis Scipione Capponi, and withdrew to a small villa at Figline, not far from the city. Abjuring the thought of writing amatory poetry in consequence of the premature death of a young lady to whom he had been attached, he occupied himself chiefly with literary pursuits, above all the composition of Italian and Latin poetry. His own literary eminence, the opportunities enjoyed by him as a member of the celebrated Academy Della Crusca for making known his critical taste and classical knowledge, and the social relations within the reach of a noble Florentine so closely allied with the great house of Capponi, sufficiently explain the intimate terms on which he stood with such eminent men of letters as Magalotti, Menzini, Gori, and Redi. The last-named, the author of *Bacchus in Tuscany*, was not only one of the most brilliant poets of his time, and a safe literary adviser; he was the court physician, and his court influence was employed with zeal and effect in his friend's favor. Filicaia's rural seclusion was owing even more to his straitened means than to his rural tastes. If he ceased at length to pine in obscurity, the change was owing not merely to the fact that his poetical genius, fired by the deliverance of Vienna from the Turks in 1683, poured forth the right strains at the right time, but also to the influence of Redi, who not only laid Filicaia's verses before his own sovereign, but had them transmitted with the least possible delay to the foreign princes whose noble deeds they sung. The first recompense came, however, not from those princes, but from Christina, the ex-queen of Sweden, who, from her circle of savans and courtiers at Rome, spontaneously and generously announced to Filicaia her wish to bear the expense of educating his two sons, enhancing her kindness by the delicate request that it should remain a secret. And now the tide of Filicaia's fortunes turned. The grand-duke of Tuscany, Cosmo III., conferred on him an important office, the commissionership of official balloting. He was named governor of Volterra in 1696, where he strenuously exerted himself to raise the tone of public morality. Both there and at Pisa, where he was subsequently governor in 1700, his popularity was so great that on his removal the inhabitants of both cities petitioned for his recall. He passed the close of his life at Florence; the grand-duke raised him to the rank of senator, and he died in that city on the 24th of September, 1707. He was buried in the family vault in the church of St. Peter, and a monument was erected to his memory by his sole surviving son Scipione Filicaia. In the six celebrated odes inspired by the great victory of Sobieski, Filicaia took a lyrical flight which has placed him at moments on a level with the greatest Italian poets. They are, however, unequal, like all his poetry, reflecting in some passages the native vigor of his genius and purest inspirations of his tastes, whilst in others they are deformed by the affectations of the *Seicentisti*. When thoroughly natural and spontaneous,—as in the two sonnets "Italia, Italia, o tu cui feo la sorte" and "Dov' è, Italia, il tuo braccio? e a che ti serve;" in the verses "Alla beata Vergine," "Al divino amore;" in the sonnet "Sulla fede nelle disgrazie"—the truth and beauty of thought and language recall the verse of Petrarch. Besides the poems published in the complete Venice edition of 1762, several other pieces appeared for the first time in the small Florence edition brought out by Barbera in 1864.

FILIGREE, formerly written filigrain or filigrane (the Italian *filigrana*, Fr. *filigrane*, Span. *filigrana*, Germ. *Drahtgeflecht*), jewel work of a delicate kind made with threads and beads usually of gold and silver. The compound word from the Latin *filum*, thread, and *granum*, grain, is not found in Ducange, and is indeed of modern origin. Though filigree has become a special branch of jewel work in modern times it was anciently part of the ordinary work of the jeweller. Signor Castellani states, in his lecture on "Antique Jewelry," that all the jewelry of the Etruscans and Greeks was made by soldering together wires and grains or minute plates of gold rather than by hammering or stamping the precious metals in dies.

The art may be said to consist in curling, twisting, and plaiting fine pliable threads of metal, and uniting them at their points of contact with gold or silver, solder and borax, by the help of the blow-pipe. Small grains or beads of the same metals are often set in the eyes of volutes, on the junctions, or at intervals at which they will set off the wire work effectively. The more delicate work is generally protected by framework of stouter wire. Brooches, crosses, earrings, and other personal ornaments of modern filigree are generally surrounded and subdivided by bands of square or flat metal, giving consistency to the filling up, which would not otherwise keep its proper shape.

Probably the oldest existing jewel work is that which has been found by Belzoni, Wilkinson, Mariette, and other Egyptian discoverers in the tombs of Thebes and other places. Filigree forms an important feature of the ornamentation. Amongst the jewelry now in the British Museum, and in the Louvre in Paris, are examples of the round plaited gold chains of fine wire, such as are still made by the filigree workers of India, and known as Trichinopoly chains. From some of these are hung smaller chains of finer wire with minute fishes and other pendants fastened to them. Most of the rings found in these collections are whipped with gold wire soldered to the hoop. The Greek and Etruscan filigree of about 3000 years ago is of extraordinary fineness and very perfect execution. A number of earrings and other personal ornaments found in Central Italy are preserved in the Campana collection of the Louvre and amongst the gems of the British Museum. Almost all of them are made of filigree work. Some earrings are in the form of flowers of geometric design, bordered by one or more rims each made up of minute volutes of gold wire, and this kind of ornament is varied by slight differences in the way of disposing the number or arrangement of the volutes. But the feathers and petals of modern Italian filigree are not seen in these ancient designs. In many earrings chains hang from the upper part, and tiny birds, such as doves or peacocks covered with enamel, are set amongst these hanging ornaments. Other Etruscan earrings are short tubes of gold, half or three-quarters of an inch long by half an inch or less in diameter, with a plate of gold attached to the side, and the whole surface covered with filigree soldered on in minute patterns. Many rings resemble fishes with the tails in their mouths, made up of thin plates of gold and wire work of the same metal. A beautiful collection of antique examples of Greek jewelry found in the Chersonese and along the coast of Asia Minor was placed, before the Crimean war, in a museum at Kertch. Many bracelets and necklaces in that collection are made of twisted wire, some in as many as seven rows of plaiting, with clasps in the shape of heads of animals of beaten work. Others are strings of large beads of gold, with grains of gold, or with volutes and knots of wire soldered over the surfaces. (See the *Bosphore Cimmerien*, in which will be found careful engravings of these objects.) In the British Museum a sceptre, probably that of a Greek priestess, is covered with plaited and netted gold wire, finished with a sort of Corinthian capital and a boss of green glass.

It is probable that in India and various parts of central Asia filigree has been worked from the most remote period without any change in the designs. Whether the Asiatic jewellers were influenced by the Greeks settled on that continent, or merely trained under traditions held in common with them, it is certain that the Indian filigree workers retain the same patterns as those of the ancient Greeks, and work them in the same way, down to the present day. Wandering workmen are given so much gold, coined or rough, which is weighed, heated in a pan of charcoal, beaten into wire, and then worked in the courtyard or veranda of the employer's house according to the designs of the artist, who weighs the complete work on restoring it and is paid at a specified rate for his labor. Very fine grains or beads and spines of gold, scarcely thicker than coarse hair, projecting from plates of gold are methods of ornamentation still used. This work requires the utmost delicacy of hand to execute, and is of extraordinary richness of effect. Signor Castellani, the modern Cellini of Italy, who has made the antique filigree work of the Etruscans and Greeks his special study, found it for a long time impossible to revive this particular process of delicate soldering; but the difficulty has been overcome at last.

Passing to later times we may notice in many collections of mediæval jewel work (such as that in the South Kensington Museum) reliquaries, covers for the gospels, etc., made either in Constantinople from the 6th to the 12th centuries, or in monasteries in Europe, in which Byzantine goldsmiths' work was studied and imitated. These objects, besides being enriched with precious stones, polished, but not cut into facets, and with enamel, are often decorated with filigree. Large surfaces of gold are sometimes covered with scrolls of filigree soldered on; and corner pieces of the borders of book covers, or the panels of reliquaries, are not unfrequently made up of complicated pieces of plaited work alternating with spaces encrusted with enamel. Byzantine filigree work occasionally has small stones set amongst the curves or knots. Examples of such decoration can be seen in the South Kensington and British Museums.

In the north of Europe the Saxons, Britons, and Celts were from an early period skilful in several kinds of goldsmiths' work. As early as the middle of the 5th century the brooches and other personal ornaments of the "Littus Saxonicum" in England were encrusted with enamel, often set in bands of pure gold, and the enamel work varied with borders or centres of filigree.

The Irish filigree work is more thoughtful in design and more varied in pattern than that of any period or country that could be named. It reached its highest perfection, according to Dr. Petrie, in the 10th and 11th centuries. The Royal Irish Academy in Dublin contains a number of reliquaries and personal jewels, of which filigree is the general and most remarkable ornament. The "Tara" brooch has been copied and imitated, and the shape and decoration of it are well known. Instead of fine curls or volutes of gold thread, the Irish filigree is varied by numerous designs in which one thread can be traced through curious knots and complications, which, disposed over large surfaces, balance one another, but always with special varieties and arrangements difficult to trace with the eye. The long thread appears and disappears without breach of continuity, the two ends generally worked into the head and the tail of a serpent or a monster. The reliquary containing the "Bell of St. Patrick" is covered with knotted work in many varieties. A two-handled chalice, called the "Ardagh cup," found near Limerick a few years since, has belts, bosses at the junctions of the handles, and the whole lining of the foot ornamented with work of this kind of extraordinary fineness. The late Lord Dunraven (*Royal Irish Academy Trans.*, vol. xxiv.) numbers forty varieties of pattern on this cup alone. Some are the Greek fret with Celtic varieties, spiral trumpet-shaped lines, interlaced bands, knots, and arabesques, all in several varieties.

Much of the mediæval jewel work all over Europe down to the 15th century, on reliquaries, crosses, croziers, and other ecclesiastical goldsmiths' work, is set off with bosses and borders of filigree. Filigree work in silver was practised by the Moors of Spain during the Middle Ages with great skill, and was introduced by them and established all over the Peninsula, where silver filigree jewelry of delicate and artistic design is still made in considerable quantities. The manufacture spread over the Balearic Islands, and among the populations that border the Mediterranean. It is still made all over Italy, and in Albania, the Ionian Islands, and many other parts of Greece. That of the Greeks is sometimes on a large scale, with several thicknesses of wires alternating with larger and smaller bosses and beads, sometimes set with turquoises, etc., and mounted on convex plates, making rich ornamental headpieces, belts, and breast ornaments. Filigree silver buttons of wire work and small bosses are worn by the peasants in most of the countries that produce this kind of jewelry. Silver filigree brooches and buttons are also made in Denmark, Norway, and Sweden. Little chains and pendants are added to much of this northern work. Beautiful specimens have been contributed to the various international exhibitions.

Some very curious filigree work was brought from Abyssinia after the capture of Magdala—arm guards, slippers, cups, etc., some of which are now in the South Kensington Museum. They are made of thin plates of silver, over which the wire work is soldered. The filigree is subdivided by narrow borders of simple pattern, and the intervening spaces are made up of many patterns, some with grains set at intervals.

Great interest has been felt in the revival of the designs of antique jewelry by Signor Castellani. He collected examples of the peasant jewelry still made in many provinces of Italy on traditionary designs preserved from a remote antiquity. Most of the decoration is in filigree of many varieties. It was in part through the help of workmen in remote villages, who retained the use of various kinds of solders, long forgotten elsewhere, that the fine reproductions of antique gold filigree have been so beautifully carried into execution in Italy, and by Italian jewellers in London.

For examples of antique work the student should examine the jewel room of the British Museum, the Campana collection in the Louvre in Paris, and the collection in the South Kensington Museum. The last contains a large and very varied assortment of modern Italian, Spanish, Greek, and other jewelry made for the peasants of various countries. The Celtic work is well represented in the Royal Irish Academy in Dublin. (J. H. P.)

FILIPPINO. See Lippi.

FILLAN, St. The accounts given by various writers of this saint, in so far as they supply any details, are, as in many similar cases, purely legendary and conjectural. That such an ecclesiastic existed, that he was of Irish origin, and that he was venerated in Glendochart and Strathfillan in Perthshire as early as the 8th or 9th century, may be held as certain. There was an ancient monastery in that district dedicated to St. Fillan, which, like most of the religious houses of early times, was afterwards secularized. The lay-abbot, who was its superior in the reign of William the Lion, held high rank in the Scottish kingdom. This monastery was restored in the reign of Robert Bruce, and became a cell of the abbey of canons-regular at Inchaffray. The new foundation received a grant from King Robert, in gratitude for the aid which he was supposed to have obtained from a relic of the saint on the eve of the great victory of Bannockburn. Another relic was the saint's staff or crozier, which became known as the coygerach or quigrich, and was long in the possession of a family of the name of Jore or Dewar, who were its hereditary guardians. They certainly had it in their custody in the year 1428, and their right was formally recognized by King James III. in 1487. The head of the crozier, which is of silver-gilt with a smaller crozier of bronze inclosed within it, is now deposited in the National Museum of the Society of Antiquaries of Scotland. It was secured for them through the exertions of Dr. Daniel Wilson, author of the *Prehistoric Annals of Scotland.* This crozier has attracted much attention among Scottish antiquaries, and its history has been minutely investigated.

On the subject of this article reference may be made to Cosmo Innes's *Sketches of Early Scottish History*, pp. 389–394, 623–624; Bishop Forbes's *Kalendars of Scottish Saints*, pp. 341–346; and specially to the *Historical Notices of St. Fillan's Crozier*, by the late eminent antiquary Dr. John Stuart, who died while this, his latest work, was passing through the press.

FILLMORE, Millard (1800–1874), thirteenth president of the United States of America. His family was of English stock, and had early settled in New England. His father, Nathaniel Fillmore, made in 1795 a clearing within the limits of what is now the town of Summer Hill, Cayuga co., New York, and there the future president was born, January 7, 1800. The father went by the title of "the squire," and served as a justice in the beginnings of the settlements nearest to him, which were very sparsely occupied. Millard, to the age of fourteen, could have shared only the simplest rudiments of education, chiefly from his parents, with slight help from a school. At that age he was apprenticed, for the usual term, to a fuller and clothier, to card wool, and to dye and dress the cloth from the farmers' houses. Two years before the close of his term, he, by a promissory note for thirty dollars, bought the remainder of his time from his master, and entered a retired lawyer's office as a student and helper at the age of nineteen. He, of course, received and accepted the usual honor extended to young men of his proclivities, to deliver the Fourth of July Oration, before he was twenty-one years of age. In 1820 he made his way to Buffalo,—then only the germ of the present flourishing city,—and supported himself as a student in another law office by teaching a school and aiding the postmaster. In 1823 he was admitted an attorney in the court of common pleas, Erie co., and then took up legal practice at Aurora, to which his father had removed. Hard study, temperance, and integrity gave him a good reputation and moderate success, and he was made an attorney and counsellor of the supreme court of the State. In 1826 he married Abigail, daughter of the Rev. Lemuel Powers. Returning to Buffalo in 1830 he formed a partnership with two lawyers, both afterwards distinguished in public life, and became successful at the bar. From 1828 to 1831 he served as a representative in the State legislature, coming in as an anti-mason. In the single term of 1832–4 he was a representative of his district in the national Congress, as anti-Jackson, or in opposition to the administration. From 1836 to 1842, when he declined further service, he represented his district as a member of the Whig party. In Congress he opposed the annexation of Texas as slave territory, was a warm advocate of internal improvements and a protective tariff, supported J. Q. Adams in maintaining the right of offering anti-slavery petitions, advocated the prohibition by Congress of the slave trade between the States, and favored the exclusion of slavery from the District of Columbia. His speech and tone, however, were moderate on these exciting subjects, and he claimed the right to stand free of pledges, and to adjust his opinions and his course by the development of circumstances. The Whigs having the ascendency in Congress during the latter part of his membership, he was made chairman of the House Committee of Ways and Means. Against a strong opposition he carried an appropriation of 30,000 dollars for Morse's telegraph, and secured important provisions in the new tariff measures of 1842. He found some supporters of his proposed nomination as a candidate for vice-president in the Whig National Convention at Baltimore. In May, 1844, being the Whig candidate for the governorship of New York, he was defeated by Silas Wright. In 1847 he was made comptroller of the State of New York, an office of manifold responsibilities and duties, which he resigned on his election, in November, 1848, as vice-president of the United States, Zachary Taylor being president. He presided over the senate ably and impartially during the seven months of exciting debate and agitation on the so-called "Compromise Measures," and Mr. Clay's "Omnibus Bill," which, though finally defeated as a whole, substantially succeeded in its general bearing on several matters of intense import to the nation as connected with the subject of slavery.

President Taylor died July 9, 1850, and the next day Fillmore, according to the special provision of the constitution, took the oath and acceded to the highest office, being then fifty-one years old. The cabinet which he called around him contained many distinguished men, as Webster, Corwin, Crittenden, Graham, Hall, and Kennedy. On the death of Webster in 1852, Edward Everett succeeded him as secretary of state. The president sent a force to protect New Mexico in the dispute as to its boundaries with Texas. The critical matter which gave its historic significance to his administration was that chief one of the class of "compromise" measures, the enactment of the Fugitive Slave Law, to make effective a provision of the constitution for the rendition of "fugitives from labor or service." Being instructed by Crittenden, his attorney-general, that the bill was not inconsistent with the constitutional sanction of the Habeas Corpus, the president signed the bill, and issued a proclamation calling upon Government officials to enforce it. These measures roused the most passionate opposition and animosity, among Whigs as well as anti-slavery men. The attempt to enforce the odious law was restricted by mobs in various free States, and was made, for the most part, wholly ineffectual, the people being resolved to regard it as annulled by the "higher law." The fact that the president had signed and sought to enforce the law, though he might plead for himself constitutional obligation, and a purpose of patriotic fidelity in the exercise of his best judgment, made a breach between him and his party. But few questioned the sincerity and purity of his intentions, or his own full persuasion that the measures were of vital necessity to pacify the nation. Still, as the result was a sharp and embittered variance among his previous supporters, his administration was regarded as inglorious, if not as a failure. In many other matters of high public concern, his official course, as indicated by his appointments, the recommendations in his messages, and the projects which he devised, was characterized by sound discretion, by humane promptings, and practical wisdom. His advice, however, even on these matters, was not always followed by Congress. That body having approved a plan for the extension of the Capitol, the president, on July 4, 1851, laid the cornerstone of the new edifice, Daniel Webster being the orator of the occasion. In the same year he interposed promptly and effectively in thwarting the projects of the "filibusters," under Lopez, for the invasion of Cuba. Commodore Perry's expedition to Japan, that of Lieutenant Lynch to Africa, and that of Ringgold to the Chinese Seas, with the exploration of the valley of the Amazon by Herndon and Gibbon, may be referred to as engaging the executive ability and wide forethought of the president. His term closed March 4, 1853. In the preceding autumn he had been an unsuccessful candidate for nomination for the presidency by the Whig National Convention, and he yielded his place to Franklin Pierce. Three weeks before the close of his term his wife died in Washington, and he quietly returned, with a son and a daughter, to private life in Buffalo. In 1854, he travelled extensively through the southern and western States, and in 1855–6 he visited Europe, moving from place to place in a quiet and unostentatious way, but receiving much courteous attention. He declined the proffered honor of D.C.L. from Oxford. While in Rome he was informed of his nomination for the presidency by the "Native American" party, the nominees of the other parties being Buchanan and Fremont. In 1858 he married Mrs. Caroline M'Intosh of Albany, a lady of fortune and culture. Retiring to his home in Buffalo, he enjoyed a studious retirement among his books and friends, taking no public share in political affairs. He took great interest in the Buffalo Historical Society, of which he was the president. His life closed March 8, 1874, in his seventy-fifth year. All who knew him in any relation accorded in regarding him as an upright and conscientious man, blameless, loving simple ways, and heartily devoted to the best interests of his country. (G. E. E.)

FILM. See CAPILLARY ACTION and OPTICS.

FILMER, SIR ROBERT, a writer of the 17th century, remarkable for his singular political theory, which deserves notice on account of the great attention which it excited, was the son of Sir Edward Filmer of East Sutton in Kent. He studied at Trinity College, Cambridge, where he matriculated in 1604. His death has been fixed at widely different dates, but of these the most probable is 1653. Filmer was already a middle-aged man when the great controversy between the king and the Commons roused him into literary activity. His writings afford an exceedingly curious example of the doctrines held by the most extreme section of the Divine Right party. Filmer's theory is founded upon the statement that the government of a family by the father is the true original and model of all government. In the beginning of the world God gave authority to Adam, who had complete control over his descendants, even as to life and death. From Adam this authority was inherited by Noah; and Filmer quotes as not unlikely the tradition that Noah sailed up the Mediterranean and allotted the three continents of the Old World to the rule of his three sons. From Shem, Ham, and Japheth the patriarchs inherited the absolute power which they exercised over their families and servants; and from the patriarchs all kings and governors (whether a single monarch or a governing assembly) derive their authority, which is therefore absolute, and founded upon divine right. The difficulty that a man "by the secret will of God may unjustly" attain to power which he has not inherited appeared to Filmer in no way to alter the nature of the power so obtained, for "there is, and always shall be continued to the end of the world, a natural right of a supreme father over every multitude." The king is perfectly free from all human control. He cannot be bound by the acts of his predecessors, for which he is not responsible; nor by his own, for "impossible it is in nature that a man should give a law unto himself"—a law must be imposed by another than the person bound by it. With regard to the English constitution, he asserted, in his *Freeholder's Grand Inquest touching our Sovereign Lord, the King and his Parliament* (1648), that the Lords only give counsel to the king, the Commons only "perform and consent to the ordinances of parliament," and the king alone is the maker of laws, which proceed purely from his will. It is monstrous that the people should judge or depose their king, for they would then be judges in their own cause. The most complete expression of Filmer's opinions is given in the *Patriarcha*, which was published in 1680, many years after his death. His position, however, was sufficiently indicated by the works which he published during his lifetime:—the *Anarchy of a Limited and Mixed Monarchy* (1646), an attack upon a treatise on monarchy by Nicholas Hutton, which maintained that the king's prerogative is not superior to the authority of the houses of parliament; the pamphlet entitled *The Power of Kings, and in particular of the King of England* (1648); and his *Observations upon Mr. Hobbes's Leviathan, Mr. Milton against Salmasius, and H. Grotius De Jure Belli et Pacis, concerning the Originall of Government* (1652). Filmer's theory, owing to the circumstances of the time, obtained a recognition which it is now difficult to understand. Nine years after the publication of the *Patriarcha*, at the time of the Revolution which banished the Stuarts from the throne, Locke singled out Filmer as the most remarkable of the advocates of Divine Right, and thought it worth while to attack him expressly in the first part of the *Treatise on Government*, going into all his arguments *seriatim*, and especially pointing out that even if the first steps of his argument be granted, the rights of the eldest born have been so often set aside that modern kings can claim no such inheritance of authority as he asserted.

FILTER, an arrangement for the separation of impurities from liquids, by passage through porous material. The filtering process is common in nature. The clearness of spring water is due to it; for such water generally comes from a considerable depth in the ground (as appears, *e.g.*, from its equable temperature throughout the year); and having traversed a variety of porous strata, it has undergone a straining action, producing the beautiful transparency we observe. This does not, of course, represent absolute purity, for the liquid retains in solution various substances acquired by contact with the strata through which it has percolated. The operation of filtration is extensively practised in purification of water, on a large scale for supply of towns and cities (now an important branch of civil engineering), and on a small scale for domestic purposes, and for the use of ships on a long voyage, etc. It is also a valued method in chemistry and the arts.

The mechanical action of straining, by which all particles larger than the interstices of the porous material are arrested, is one important function of filters, and it used to be commonly represented as their only function. They may act, however, in other ways to purify water. Not to speak of the further mechanical actions of subsidence on upper surfaces of particles of the filtering medium, and lateral attraction and adhesion of suspended matter (which doubtless occur in some measure), it is an important fact, now well ascertained, that a filter may separate from water a portion of the matter held in solution. On the other hand, it is often precisely such matter, when of organic origin and putrescent (and minute invisible disease-germs may here be included with the matter in solution), that it is specially desirable to remove from drinking water as being prolific of mischief when taken into the system. In numerous instances an outbreak of virulent disease, such as typhoid fever, has been clearly traced to water so contaminated. The danger is the greater that such water may be bright and sparkling, and peculiarly palatable.

That even sand has the power of removing dissolved matter from water was shown by Mr. Witt's valuable experiments at Chelsea, described in 1856. In one of these, *e.g.*, water containing 1·42 grains of chloride of sodium per gallon (70,000 grains) was deprived of 22 per cent. of that substance by filtration through a depth of 1 foot 9 inches of sand. The sand had no appreciable action on dissolved organic matter, as charcoal had, but the quantity of such matter originally present was small. It is probable that all finely porous material has such action, more or less. The efficiency of charcoal in this respect, and especially fresh animal charcoal, has been well demonstrated and utilized. The mode of the disappearance of dissolved organic impurities has been a disputed point. Some say they are retained and accumulated in the pores of the charcoal; but the experimental evidence seems to leave little doubt that they are mainly oxidized, so as hardly to impair the activity of the filter. In fact, the value of a filtering material will be found to depend chiefly on the power it has of bringing oxygen, stored in its fine pores or otherwise provided, into chemical union with the dissolved organic matter and destroying it. At the same time it is obvious that, chiefly by the mechanical action of straining, organic matter may accumulate in a filtering medium, and in course of time, through decomposition, render the water which passes through more impure and less wholesome than in its unfiltered state.

We may remark here that river water and shallow well water, while extensively used for water supply, are in general the most largely polluted. Rivers commonly receive large volumes of sewage, impure surface water from cultivated land, and other contamination. The water of shallow wells, especially in large towns, or when near churchyards, stables, cesspools, etc., is often contaminated with organic matter of the worst kind, in large quantity. While rain water, collected from the roofs of houses in butts, no doubt contains organic matter, this hardly bears comparison in amount to the organic impurity in rivers (thus Dr. Hassall found it a hundredfold less). Deep spring water, again, is freed from much of its organic impurity through natural filtration. The advantages of a good lake-supply for large towns has been amply demonstrated in these days, notably in the case of Glasgow, which draws its water from Loch Katrine.

Though the arrangements for water supply of most of our large towns include filtering processes by means of which, as a rule, excellent drinking water is abundantly provided, so that in the opinion of some chemists a domestic filter may be superfluous, while it is sometimes a source of harm (owing to lack of proper attention), it is generally thought a wise additional safeguard to employ one of those instruments, in view, more especially, of some of the possible consequences of epidemics and floods, and the necessity of house-storage of the water received. In country places, and in various other circumstances, their use is often quite imperative if the laws of health are to be respected.

The Japanese and Egyptians seem to have used water filters at an early period. These consisted of sandstone or unglazed earthenware, and were of bowl or egg shape, with small projections at the top resting on a wooden frame. The water poured into this vessel filtered through to a vessel below. About the middle of last century, slabs of a lias found in Picardy were used as a filtering agent, being fitted as a false bottom in water cisterns; the water was drawn off through a tap from the space below. A porous filtering stone of Teneriffe was at one time imported largely into England. The "alcarrhazas" are filter vessels of porous biscuit stoneware made in Spain.

One of the earliest filters in England was that patented by Mrs. Johanna Hempel in 1790. It was a supported basin made of tobacco pipe (or similar) clay and coarse sea, river, drift, or pit sand, and hardened in the furnace. In the following year (1791) the ascending principle was first applied by Mr. James Peacock. Water from an upper reservoir was admitted through a pipe to the bottom of a box containing strata of sand, gravel, and a mixture of charcoal and powdered calcareous stone. Passing up through this, it was drawn off by a pipe at the top. The filter was occasionally cleaned with an exhausting and condensing pump, which sucked up water rapidly through the filtering material and then sent it back with force, washing out the dirt.

The construction of filters is a matter on which inventiveness has been largely exercised. All sorts of porous substances have been called into requisition, as may be seen by a glance at the patent records. Thus, to mention some of these, we have various kinds of stone, sand, gravel, powdered glass, clay, porous sulphur, preparations of iron, charcoal (vegetable and animal), cloth, felt, horsehair, skins, paper, silicated carbon, sponge, wood, wool, cane, capillary threads, and so on. Vegetable charcoal, we may note, was first employed in 1802, animal charcoal in 1818, and solid carbon blocks in 1834.

It is impossible here, and it would be tedious, to give anything like a detailed account of the changes that have been rung on the filtering principle for domestic filters. In the simplest and most familiar forms, of course, the water passes down by its own gravitation through the filtering medium to a reservoir below. The force of downward pressure has sometimes been augmented by a head of water, sometimes by a force pump, and sometimes by means of air condensed above the water to be passed through the filter. Or the air has been extracted from the vessel containing the filtered liquid, thus adding force to the atmospheric presure above. The ascending principle has appeared in various applications; and in some cases the water has been caused first to descend and then to ascend through filtering material (a vertical partition, *e.g.*, being fixed in a vessel so as to reach nearly to the bottom, and layers of sand and vitrified limestone being placed on either side of the lower part; the water is poured in on one side of the partition and drawn from the other side near the top). Lateral filtration has also been tried. Filters have been arranged to act in the cistern, or in connection with the service pipe between the cistern and the water tap, or independently, and, in the latter case, either having the unfiltered water poured into them, or being placed in a vessel of it, and giving filtered water through a tube. Sometimes a series of separate connected vessels have been employed; and for very dirty water it is often advantageous to have one system of filtration for the coarser, and another for the finer impurities. Once more, filters have been rendered self-supplying by means of a ball-cock. These are some of the general forms which the filter has taken.

The application of pressure to filters cannot as a rule be pursued very far, for it tends to derange the apparatus and render the filtered liquid muddy. Enlargement of surface is a better means of obtaining rapid filtration. Upward filtration, while it offers some advantages over downward, has not hitherto come very much into use. It is open to objection in that the water sent upwards has a tendency to force a passage through certain channels, without being uniformly disseminated in the material; and the deposit of any filth is excluded from view, and mostly also from smell, instead of being exposed and giving us warning.

In passing now to examine more closely some of the approved forms of domestic filter at present in use, it should be borne in mind that while any of these filters will doubtless purify water both mechanically and chemically, more or less, it is only on condition of their being properly attended to, and the filtering material renovated at intervals depending on its nature and the nature and amount of impurity in the water. The term "self-cleansing," applied to some filters, may have a (limited) true sense, but if understood to imply that a filter, let alone, will go on *ad infinitum* giving pure water, it is quite inapplicable; solid impurities *must* accumulate and call for removal. The statement, occasionally made, that a filter is "warranted to remove all impurities" from water is absurd and hardly deserves notice. Absolutely pure water is a thing almost unknown; careful distillation alone will give an approximation to it. Again, the claim that a filter will remove *all* lime from water is often false; filtration is capable of removing only a small quantity of lime. It must be allowed that sundry points in the process of filtration still remain in some obscurity, and it is matter of regret that the action of some common filtering agents has not been so fully cleared up by scientific experiment as others. Still enough has been ascertained probably to guide to the construction of a filter on rational principles.

In a large proportion of filters, as already indicated, some form or other of carbon is the chief filtering agent. The well-known filters of Lipscombe are cylindrical-shaped covered vessels of glazed earthenware, in which the filtering medium, a mixture of vegetable and animal charcoal, in granular form, is enclosed between two slabs cemented in the case. The upper (glazed earthenware) slab has a central aperture with raised border, and a small perforated basin immediately below it; into this is inserted a sponge to arrest the grosser impurities, which is taken out and cleaned at short intervals. The filtered water passes through the lower (and porous) slab to the reservoir below, which communicates above with the outer air by a narrow tube passing up within to the top of the apparatus, and delivers its water through a tap.

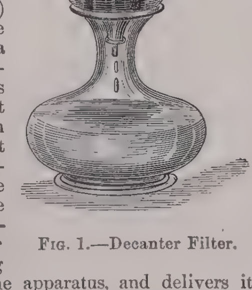


FIG. 1.—Decanter Filter.

Charcoal in the form of solid finely porous blocks, which can be conveniently brushed and cleaned externally, is now often moulded for filters. The convenient decanter filter in which the water passes through the block to a central tube, forms an elegant addition to the sideboard. The annexed figure (1) represents one of these as made by Atkins, who also furnishes earthenware filter vessels having a division across the inside wherein a carbon block is fitted water-tight, which can readily be taken out and cleaned and replaced, or a fresh one substituted. Sometimes the block is fitted in a movable pan. Again, in the filter shown in fig. 2 a double filtration is effected, the water passing first through loose charcoal B, then through a charcoal block C, supported as shown. The block in this case is said to last longer without cleaning. The movable and perforated earthenware plate A, which is placed above the charcoal (see fig. 3), allows of easy renewal of the latter. The charcoal used in these filters is chiefly of vegetable origin. They are found to remove more or less of organic and inorganic matter dissolved in water.

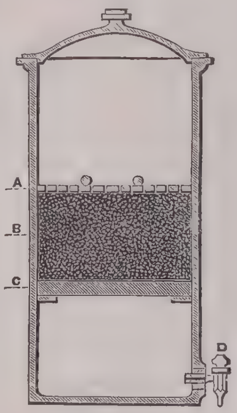


FIG. 2.—Filter with double action.

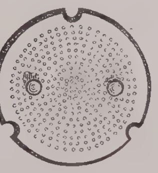


FIG. 3.—Plate at A in figure 2.

It may be useful here to call attention to some of the conclusions arrived at regarding charcoal in the sixth report of the Royal Commission on Rivers' Pollution a short time ago. *Fresh* animal charcoal has been proved to act powerfully in the removal of organic impurity (considerably more so than vegetable charcoal), as well as of mineral matter. But, according to Dr. Frankland, its reduction of the hardness ceases in about a fortnight, the removal of organic matter continuing even after six months, though to a much less extent, especially if the filter be much used. It was found necessary to renew the charcoal every six months when used for filtering the comparatively pure water of the London New River Company, whilst the water of the Thames required renewal of the charcoal every three months. If this be not done, myriads of minute worms, we are told, are developed in the material passing out with the filtered water. Other statements of scientific weight, regarding animal charcoal are more favorable to it, and seem to show that under certain conditions, perhaps imperfectly understood, it may give better results.

In Major Crease's system, which is adopted in the British army and navy, loose animal charcoal is compressed between plates by means of a screw, the amount of compression being determined by the degree of impurity in the water to be filtered.

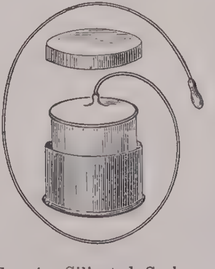


FIG. 4.—Silicated Carbon Siphon Filter.

The silicated carbon of Mr. Dahlke's filters is obtained by mixing animal or vegetable charcoal with the residue of distillation of Boghead coal. By adding a little clay to the latter product, and saturating the whole with oily matter, it can be moulded, after which it is burnt. In one form of the filter, two carbon blocks are sealed into the interior of an earthenware vessel, granulated carbon being placed between them; in another, a double action is obtained by placing a carbon block over the entrance to a second carbon medium. These filters have been highly commended for their chemical properties, attributed to magnetic oxide of iron present in the medium. We give (fig. 4) a representation of the silicated carbon siphon filter with its case. Water may be sucked through it from a stream directly into the mouth, or passed siphon-wise from one vessel into another. These and similar pocket filters of Atkins's were supplied to the Ashantee expedition.

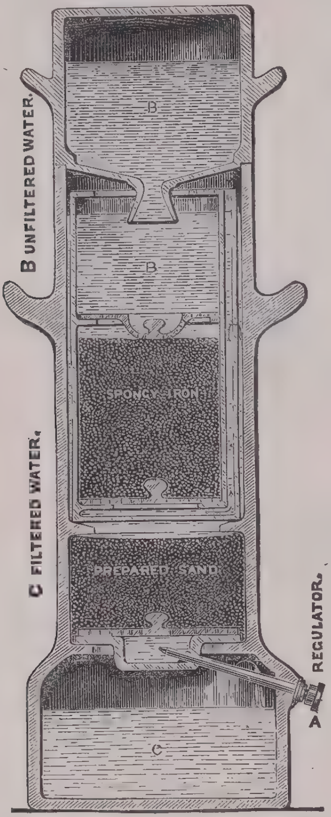


Fig. 5.—Bischof's Spongy Iron Filter.

A very powerful filtering medium was discovered and introduced many years ago by Mr. Thomas Spencer. It is called *magnetic carbide*, and consists of protoxide of iron in chemical combination with carbon. It is obtained by roasting hematite iron-ore with granulated charcoal for twelve to sixteen hours at a dull red heat. Mr. Spencer considers the purifying property of the oxide to be due to its power of attracting oxygen to its surface, without the latter being acted upon, the oxygen attracted being then changed into ozone, by which the organic matter of the water is consumed. The magnetic carbide is used in granular form. This filter gained prize medals at the last London and Paris exhibitions, and its efficiency was demonstrated by the *Lancet* Sanitary Commissioners' report on filters in 1867.

The only other system we shall here notice is that in which spongy iron is used. This substance is metallic iron which has been reduced from an oxide without fusion. It is in a spongy or porous state of extremely fine division. Its remarkable purifying action on water was discovered by Professor Gustav Bischof of the Andersonian University, Glasgow; and experiments made with his filters by the Royal Commissioners already referred to showed that their power both of removing organic matter and reducing the hardness of water even increased during upwards of eight months' constant use. The general form of the filter is represented in fig. 5. An inner vessel containing the spongy iron is supported in a case, which, below, contains some prepared sand, a regulator A, and a receptacle C, for filtered water (with tap, not shown). The unfiltered water B is in this form supplied from a bottle which is inverted into the upper part of the inner vessel (a method familiar to chemists). After passing through the spongy iron, the water ascends through an overflow pipe in the direction of the arrows; the object of this is to keep the spongy iron, when once wet, constantly under water, as otherwise it is too rapidly oxidized. The object of the prepared sand (which is generally in three layers, viz., pyrolusite at the top, then sand, then gravel) is to separate traces of iron retained in solution. The regulator A consists of a tin tube cemented in the position shown; it is open at the inner end, which is below the perforated bottom supporting the sand, and closed by a screw cap at its outer end. It has also a small lateral perforation, through which alone the filtered water passes into the reservoir. Should the perforations get choked, the screw cap is removed, and a brush inserted; on starting at first, too, the cap is unscrewed, that the materials may be well washed out without soiling the lower reservoir. With a ball-cock and constant supply of water, the inner vessel is dispensed with.

The nature of the action of the metal on organic matter is rather obscure. Mr. Bischof considers there are both reducing and oxidizing agencies constantly at work, and that the oxides of iron, being present in their nascent state,

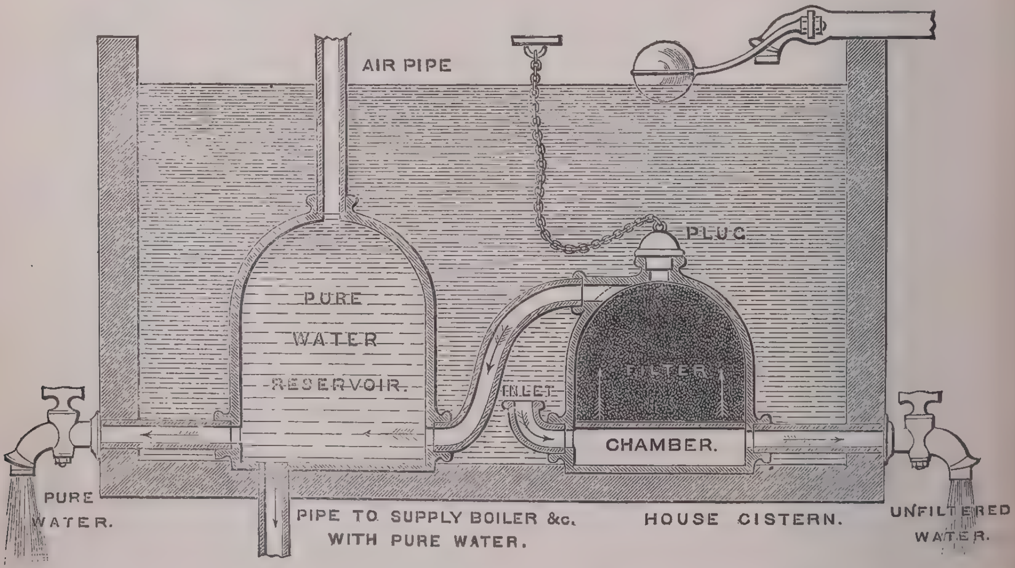


Fig 6—Lipscombe's Cistern Filter.

must be very energetic in their action. Probably ferric hydrate, the last product of oxidation, takes an active part in separation of the organic matter, transferring oxygen to it. Again, spongy iron is known to be very energetic in precipitating any lead or copper. Its reduction of the hardness of water presents some difficulty.

This filter, we may add, recently gained the prize medal for general excellence given by the Sanitary Institute of Great Britain, and has been otherwise commended.

The subject of cistern filters (of which there are many varieties) need not detain us long here. The arrangement adopted by Lipscombe, shown in fig. 6, may be taken as an example. The impure water passes through the inlet into the chamber of the filter, thence upwards through a plate of porous stone, then through powdered charcoal into the pure water reservoir, whence it may be drawn off cold by the pure water tap, or hot and pure from the boiler. When the filter is in action, the grosser impurities are stopped by the porous stone, while the finer pass into the charcoal and are chemically acted on. Each time the unfiltered water tap is opened to obtain water, unfiltered water enters the inlet and scours out the impurities in the chamber. To clean the filter, once every six months or other period, a plug is drawn up by means of a galvanized chain (attached as shown) from the top of the filter and dropped into the inlet. The unfiltered water tap is then turned on several minutes, so that the cistern water rushes down through the filter and out of the tap, carrying out impurities from the filter.

In the filtration of water for supply of towns, galleries of masonry are often constructed in the sand and gravel forming the river bed or banks; the water percolates through and enters these tunnels at the bottom and by side channels; it is thence pumped to the town. Genoa, Toulouse, Lyons, and Perth present examples of this system, which is apt to prove rather costly. The system of artificial filter-beds of sand resting on gravel, etc., is now more generally adopted. It was first introduced into London by Mr. Simpson, in 1839, after a study of various works in the north, and especially of the costly experience of Glasgow. For the Chelsea Water Company he had a series of tunnels built of brick without mortar; these were covered with a layer of fine gravel 2 feet thick, then a 2-feet stratum of fine gravel and coarse sand, and lastly 2 feet of fine sand, or 6 feet in all. The sand was periodically removed to the depth of about half an inch. To the filter bed, covering 1 acre, were attached two reservoirs, slightly higher; into these river water was pumped, which, after time for subsidence, was admitted to the filter beds through small pipes.

The eight Water Companies of London all use similar beds, increasing in coarseness downwards, of various depth and proportion of materials. A sharp siliceous sand is preferred for the upper bed (the true filtering agent), and the stratum is seldom made less than 2 or more than 3 feet thick. Sometimes this bed is laid immediately on a bed of small shells.

It is considered that filtration through sand, to be effective, should not proceed more rapidly than 6 inches of descent per hour (in the London beds the rate varies from 2·5 to 10·7 inches), and that there should be about 1½ square yards of filtering area for each 1000 gallons per day. The depth of water maintained on filter beds varies between 1 foot and 7 or 8 feet. The inlet arrangements should be such as to produce little disturbance of the sand in charging; thus the water may be admitted into a long trough from which it gently overflows, or through an inlet pipe carried to the centre of the bed and turned upwards (at Chelsea the water enters through a wall of gravel between two horizontal concentric arches of brickwork with vertical joints). The beds are drained variously, *e.g.*, by means of perforated stoneware pipes, or pipes with open joints, sometimes leading into a brick culvert which traverses the bed. A good method of draining is that of Mr. Muir, adopted by the New River Company. It consists of two courses of bricks laid flat and dry; in the lower, the bricks are placed end to end in series alternating with half-brick spaces which serve as drains leading to a central culvert; in the upper course, the bricks are laid close together, forming a floor, on which a thin layer of fine gravel supports a bed of sand.

Filter beds require to be cleaned, at intervals varying from one week to six or eight, by removal of about half an inch of sand. The clean sand remaining is loosened with a rake and exposed to the air some time, then smoothed over. The filter bed may be made with several compartments, some of which may remain in action while others are being cleansed. There are various contrivances for washing sand previous to its replacement. Filter beds are sometimes arranged to be cleansed by a reverse current sent upwards with force,—an operation which may be aided by stirring the surface sand after the water has come above it. Such a system is practised, *e.g.*, in the Greenock, Paisley, and Dunkirk water works. At the last-named place, washed coke is among the filtering agents used. (For an account of the works at Dunkirk see *Engineering*, vol. xiv. p. 206.) In the system of M. Maurraz the water is filtered both *per ascensum et descensum*, the two portions of water, which flow in opposite directions, uniting at the middle. The sand is retained in closed and perforated boxes. This filter also permits of cleansing by reversal of the current. Mr. Spencer's carbide system has been applied successfully on a large scale at Wakefield and other places, the carbide layer being combined with others of sand and gravel. With carbide, the total thickness of bed may be considerably reduced.

Filtering is frequently practised by the chemist. And whereas in the ordinary filtration of water above described the purified liquid is the object of the process, while the matter retained is merely to be got rid of and destroyed, the reverse may be the case in the laboratory, the retained matter being sought, while the "filtrate," as it is called, is disregarded. For most laboratory preparations the material used is unsized paper. Swedish filtering paper (which is prepared with very pure spring water) possesses the advantage of filtering very rapidly, and of being singularly free from inorganic matter. Cloth is employed in the case of viscid liquids such as syrup or white of egg; while corrosive liquids may be filtered through pounded glass. Asbestos is a valuable filtering material, since, by making it red hot, all organic matter may be destroyed, and acid and alkalies have scarcely any action in it. Being nearly indestructible, it can be repeatedly used. Glass-wool has also of late years been recommended.

Paper filters, to be placed in a funnel, are sold ready cut of circular shape. The paper is folded twice to the form of a quadrant, and this, when half opened, forms a cone, whose edges meet at an angle of 60°. To facilitate passage of the filtered liquid, small folds are sometimes made in the filter all round. In a filter devised by Bunsen, the neck of the filter is inserted in the caoutchouc stopper of a lower vessel, and through this stopper also passes a tube connected with an exhausting apparatus. The production of a partial vacuum below accelerates the filtering process. Sometimes substances have to be filtered under the influence of heat, as they solidify at ordinary temperature. In such cases the funnel may be surrounded by a sleeve containing water, which is heated with a lamp.

In Robinson's oil filter, oil is forced up from a cask into and through the filtering apparatus (containing charcoal or other medium) by water entering below from an upper reservoir. Sundry modes of filtration practised in the arts (sugar-refining, etc.) will be referred to elsewhere. In some of them centrifugal force is employed.

Circumstances are not uncommon in which it is very desirable to remove impurities from air by a process of filtration. Cutlers and other grinders use respirators to arrest the small particles which would otherwise find their way into the lungs. For steel particles magnetic gauze is an efficient protective. Professor Tyndall's respirator for firemen consists of an iron cylinder, attached to a mask, and containing charcoal, and three layers of cotton wool, one moistened with glycerine; the ends of the case are of wire gauze. With this respirator it is possible to enter an atmosphere of dense smoke and remain in it over a quarter of an hour. The disinfecting properties of charcoal have been turned to good account by Dr. Stenhouse for purifying air, the substance being used in the construction of respirators, or at the outlet of sewers, etc. An interesting application of the principle was made in the justice room of the Mansion House, London, in 1854, where offensive smells originating just under one of the windows were effectually removed. There are various devices in existence for purifying the air admitted to railway carriages and other inclosed spaces. Thus the air may be passed through wire screens, or through a spray of water, etc. In connection with biological research and the germ theory of disease, the removal, by filtration, of minute foreign particles from air is a matter of great moment.

For further information see, among other works, Humber's *Water Supply of Cities and Towns*, 1876; *Sixth Report of the Royal Commission on Rivers' Pollution* (published in 1875); *Lancet Sanitary Commissioners' Report on Filters*, 1867; Wanklyn and Chapman's *Water Analysis; Philosophical Magazine*, 4th series, vol. xii. p. 30 (Witt); *Proceedings of the Institution of Civil Engineers*, May, 1867 (Byrne); Paper by Mr. Pearse, on *Water Purification, Sanitary and Industrial*, to Society of Engineers, March 4, 1878; Paper by M. Bischof, on *The Purification of Water*, to Society of Arts, April 25, 1878; Registrar-General's Returns for 1876, etc.; *Chemical News*, vols. xxxiii. and xxxiv. (Wanklyn, Hildebrand); Dictionaries of Ure, Knight, Tomlinson, Watts, etc. (A. B. M.)

FINALE DELL' EMILIA, a town of Italy, circle of Mirandola, province of Modena, is situated on the right bank of the Panaro, 10 miles from its junction with the Po. It receives its name from its situation on the border line between the duchy of Modena and the States of the Church. It has manufactures of silk and woollen fabrics, and some trade in corn, wine, hemp, and fruits. Finale owes its origin to a castle connected with the monastery of Nonantola. The town was taken by the imperial troops in 1703 on its being abandoned by the French. It was again taken by the French in 1704, and by Prince Eugene in 1706. The population in 1871 was 4456.

FINANCE. In the 13th and 14th centuries, the words finare, finacio, and financia were employed, principally by writers in France, to denote those bargains by which the indefinite liabilities of ancient tenures were commuted for fixed sums payable to the immediate lord of the tenant. It was at this time that the commutation became general, except when the service of the tenant was of a military or dignified character. Even here, however, a remarkable innovation was made at an early period in English social history, on which we shall comment presently. In course of time the word finance became nearly synonymous with the product of taxation, and the finances of a country (though the phrase is sometimes used to denote the aggregate revenues of those who are liable to taxation) are understood to be the ways and means by which the expenditures of government, imperial and local, are met. In the present article we shall deal with the history of finance only. Under the head of TAXATION, the reader will find an analysis of the economical theory, in accordance with which taxation is shown to be innocuous and equitable, or the reverse.

The most ancient forms of finance have always been taxes on produce. Such appear to have been the taxes of ancient Egypt; such were and still are the principal taxes of Turkey and Hindustan. Whatever may have been the character of the first agricultural settlement, the development of a central government has always been assisted by a theory that the true lordship of the soil is the property of the state or the ruler, on which the immediate occupant of the soil is dependent, and to which a portion of the produce is due. The conquests of Rome always involved a confiscation of the vanquished nation's land, and the re-grant of a portion of the confiscated estate on what we might call by analogy a base tenure. In the same way, when in the 10th and 11th centuries the Christianized Teutonic tribes of north-eastern Europe pressed on the heathen Slavs, the victory of the former was always followed by the establishment of a military and well-endowed church, on which a third of the conquered territory was generally settled, the vanquished race being permitted, though in a state of dependence, to occupy the residue. The settlement of Ægina and Eubœa by the Athenian lot-holders, to say nothing of more ancient occupancies, was of the same character. Here indeed the state distributed the ownership which it had acquired by its arms among its citizens, though doubtless it claimed military service from them as a garrison, and probably exacted a revenue which was similar in its nature to a rent.

The financial system of ancient states was, as a rule, exceedingly simple. The charges of government were few, except in the vast despotisms of Asia and Egypt, and later on in the great military republics of Carthage and Rome, where the revenues of the king and state were derived from tribute in money or kind from inferior or dependent districts and races. The district of the Aristotelian ideal city (*Politics*, vii. 10, 11) is to be divided into two portions, one the property of the state, out of the produce of which the charges of the national religion and the costs of the common tables are to be supplied, the other to be held in private ownership. The philosopher does not contemplate the necessity of making provision for the ordinary charges of government. The magistrates were unpaid; the army was a militia, serving at its own charges. When the Lacedæmonians undertook the command of the allies in the Peloponnesian war, they had no public revenue. Later on in their history, we are told by Aristotle that the public exchequer of the Lacedæmonians was ill managed, for most of the land of Laconia belonged to the Spartiats, and they assessed themselves.

The beginning of Athenian finance was a revenue derived from the silver mines in the promontory of Sunium, the ownership of which was, it seems, vested in the state. It was the practice of the Athenian Government to grant a perpetual lease of allotments in these mines, and to exact, moreover, a small percentage on the produce, reserving to itself a right of forfeiture and re-entry if the terms of the lease were infringed, or the produce rents were unpaid. With the proceeds of these mines the Athenians built their first navy, and with this navy they won the victory of Salamis, thus paving the way to their naval supremacy.

The next great source of Athenian revenue was the contribution from those protected states which failed to supply a proper naval contingent for the defence of the Ægean. Most of the Greek cities of Asia Minor and the islands owed their security from the attacks of the Phœnician navy, then dependent on Persia, to the vigorous and effective sea forces of the Athenian republic. It was cheaper for them to commute their contingent for a money payment, and the police of the sea became far more efficient when wielded by a single power, which had every interest in bringing its navy to the highest pitch of serviceableness. The Athenians contrived to economize, and, later on, to increase the contributions of those states whom they protected. Considering that they had fully satisfied the terms of their own bargain if they thrust back the Persian despot, they concluded that they might fairly accumulate a surplus in the public treasury, and even expend a portion of their revenues in embellishing their city. We may be certain that the power which this revenue gave the Athenian republic was the chief cause of that jealous fear which precipitated the thirty years' war of the 5th century B.C., and which produced results as disastrous to the progress of mankind as a war of the same duration twenty centuries later did on the rapidly growing civilization of central Europe. So desperate and so penniless were the military rivals of Athens, overwhelming as their land forces were, that they even thought of appropriating the sacred treasures of Delphi, a proposal, in the 5th century before Christ, which was as shocking as it would have been in the 12th century after Christ to have suggested that the sacred vessels and shrines of the great churches and monasteries should be coined in order to pay the soldiers of the crusade.

The finance of antiquity derived a revenue from customs. These customs were, at least in Athens, an ad valorem duty of two per cent. as a war measure. Twelve years before the conclusion of the great thirty years' struggle, the Athenians levied a five per cent. ad valorem duty on their subject cities, though this was in substitution for the old contribution on account of the police of the seas. A poll-tax was levied on foreign residents, perhaps on slaves; and it appears that, possibly as a measure of police, another poll-tax was imposed on the inmates of disreputable houses.

The revenue, therefore, of that Greek state whose history is best known to us was derived from the rent of public lands, especially the mines, from a composition paid by the allies in lieu of naval service, from very moderate customs duties, and from a few personal taxes. It must not, however, be imagined that the finance of antiquity was successful in the eyes of those who saw how inelastic it was. There is still extant a treatise by a very practical man. Xenophon, in the oldest work on finance, discusses the means by which the Athenian home revenue might be conveniently increased, and, like many other speculative thinkers, suggests projects which would have created far more mischief than they would have remedied. It will be obvious, also, that by far the most important item in Athenian finance, the contributions from the allies in lieu of personal service, was necessarily precarious, and that when the Athenian empire was finally broken up, the revenue of the state was gone, while the necessity of finding ways and means for the public defence was as urgent as ever.

This brings us to another aspect of Athenian finance, viz., the extraordinary taxes on property which the Government levied, and which the contributors paid apparently with the greatest readiness. These were the *Λειτουργίαι*, exceptional imposts with a view to defraying certain kinds of public expenditure; and property taxes assessed on a valuation, and graduated according to the means of the contributor.

The principal liturgies, as they are called from the Greek word quoted above (the word is suggestive of the process by which it was finally appropriated in the ecclesiastical vocabulary), were three in number, two religious and one secular. The tendency of a religion like that of Greece, in which so much nature-worship was contained, was to associate many of the acts of life with religious ceremonies, and, as culture progressed, with art. Thus the drama of antiquity arose from the worship of the wine-god and the vintage, and the arts of sculpture and painting had originally a similar religious origin. The dramatist who succeeded in securing a representation of his composition had assigned to him a citizen whose wealth was sufficient to defray some of the charges of representation, as the instruction, maintenance, and dresses of the actors. A second and similarly religious service was the public games. Here again a considerable portion of the expenses incurred in the performance were imposed on wealthy persons. The third was the trierarchy, the equipment and command of a ship of war. The state supplied the ship, the trierarch its stores and tackling, and in some cases provisions and pay. In return, the trierarch was captain of the ship. This arrangement is closely analogous to that financial arrangement in England by which, after the Revolution, local regiments were raised, clothed, and officered by wealthy men, who had in return the colonelcy of the regiment, and the right of appointing its subordinate officers.

The liability to these charges, distributed, as it seems, at the discretion of the Government, was a serious charge on the wealthy. Hence, when the state fell on evil days, and reverses had impoverished the Athenian people, persons were allowed to club together in order to supply these public functions. To abandon them would have been to incur the wrath of the gods, or imperil the safety of the state. The modern critics of Greek sentiment are amazed at the fact that only on the very eve of the great crisis in which the fate of Greece was finally determined, the battle of Chæronea, Athens reluctantly devoted the taxes which had hitherto been employed for ecclesiastical purposes to the pressing necessities of the public defence. The theoric fund was that portion of the revenues of the state which was assigned to those sacred purposes. It was distributed nominally among the spectators as the price of tickets for admission. It actually was paid over to the managers of those public buildings in which the ceremony was performed.

If the person on whom the duty of supplementing the charges of the state was imposed conceived that he was unfairly selected, or asserted that his means were inadequate for the purpose, he was allowed to name another citizen to whom he could proffer an exchange of property. In this offer the other was bound to acquiesce, unless he consented to allow himself to be substituted for the individual on whom the duty was originally set. In short, the possession of property involved serious liabilities in Athens, though it seems that men of substance gloried in the satisfaction of these public charges, and completely conformed themselves to public opinion. For it will be found to be a fundamental law in successful finance that those imposts are always found to be most productive which are most in accord with public opinion, and that in the selection of a system of taxation it is not always possible to adopt that which is most expedient or even most just, but that which can be most readily enforced and is most willingly accorded.

But the most remarkable illustration of Athenian opinion in matters of finance is the regular property tax. In the costly services which have been sketched above, some compensation was afforded to the contributor by the position he occupied. The choragus was the chief official in rank at those religious ceremonies in which the drama was the highest act of worship; the chief of the gymnasts exercised authority over his staff of competitors in the public games, and was even empowered to compel parents to allow their children to take part in the contest. The man of substance on whom the state imposed the duty of equipping, manning, and provisioning a hull was captain of the vessel, and though he was liable to a due performance of his service, and subject to an audit on the termination of his year of office, he exercised full authority during his command, and might be, indeed was, rewarded for exceptional diligence and smartness during the period of his office.

The property tax was a contribution which did not make the tax-payer conspicuous, and did not confer on him any distinction. The impost dates from the earliest records of the Athenian constitution. It was graduated, being a heavier percentage in the case of the richer citizens than in that of the middle classes. It passed through several notable changes, always, however, in the same direction, the particulars of which are well given in Boeckh's *Public Economy of Athens*. But the principles of the assessment are very simple, though the process by which the result was finally arrived at is somewhat artificial.

The property of every Athenian citizen was assessed, whether it were movable or immovable, and the amount was entered in a public register. The assessment included the value of slaves, manufactured goods, and raw materials. A register of the assessment was open for examination, and undoubtedly re-valuations were frequent. The state was informed as to the property which each citizen—and indeed every resident alien—possessed, and made this property the basis of direct taxation. It then proceeded to divide all assessments into several schedules, assuming in each schedule a variable quantity, varying from a fifth to a tenth, as the taxable property of the individual. On this sum it levied a fixed rate. Thus, if a very wealthy man possessed an estate valued at 500 talents, *i. e.*, nearly £122,000, his taxable wealth was treated as £24,400, and a five per cent. tax, £1220, exacted from him; while the owner of property valued at 25 minæ, *i. e.*, about £101, 10s, the lowest sum apparently which was liable to property tax, found his property assessed for purposes of taxation at £10, 3s., and his property tax of five per cent. at a little over 10s.

In the budget speech which the great statesman of the Athenian empire delivered before the commencement of the Peloponnesian war, and of which Thucydides gives us the heads, we learn that the revenue of Athens from the contributions of her allies amounted on an average to 600 talents (£147,250) a year, and that there was an existing accumulation of treasure in coined silver amounting to a million and a half sterling, besides other immediate resources. It is to be regretted that the historian did not supply us with further particulars as to the finance of his country during the period of her greatest wealth and power. These resources, had Athens merely carried on a defensive warfare, would, as the statesman justly argued, have rendered the country not only unconquerable, but practically invulnerable.

The high rate of interest, and the general insecurity of society, excluded the states of ancient Greece from having recourse to regular loans, though not from attempting to meet current exigences by anticipations of revenue. Occasionally portions of the revenue were assigned to creditors; sometimes the public lands were granted for a term, during which the principal and interest might be repaid. Instances may even be found in which the state issued a currency of tokens, which fulfilled some of the functions of state paper in modern times. Another financial expedient, always followed by the most mischievous consequences, was occasionally adopted, the issue, namely, of a debased currency. But from this fraud Athens always kept herself free, not only inflicting the punishment of death on those who put base money into circulation (the criminal code of Athens having been generally very lenient), but abstaining in her deepest distress from the temptation of supplementing her revenues by the temporary issue of base money. So studious was Athens of her reputation in this respect that, when she was the home of the fine arts, she continued to maintain the clumsy archaic type of her coinage, although the arts of die-sinking and coining were carried to perfection in states which were far less scrupulous.

The revenue of Rome in the earlier ages of the republic was derived from the lands of the state, payments in kind or money from subjects, from import and export duties, and a few taxes on products and articles of luxury. Partly as compensation for the loss of the national domain, partly as a means of checking discontent, the state, in the later ages of the republic and the beginning of the empire, undertook the maintenance of its poorer citizens, either by gratuitous distributions of corn, or by the sale of food at low fixed prices. Cicero calculates the charge incurred by the revenue in consequence of this expedient at one-fifth of the public expenditure. Augustus increased the charges of maintaining these state paupers till the cost amounted to more than half of what had been the revenue of republican Rome. The emperor Vespasian declared (Suet., *Vesp.* 16) that the necessities of government in Rome required a sum of £400,000.000 sterling, apparently after the destructive civil war which preceded the elevation of the Flavian family to the throne. But the manner in which the revenue of the Roman empire was collected was even more destructive than the crushing weight of the charge itself.

The collection of taxes in Rome, both under the republic and the early empire, was entrusted to contractors, who purchased by auction the right of levying the tax. The character of the Roman contractor is aptly illustrated by Livy, who narrates the frauds practised by those persons on the Roman treasury during the deepest distresses of the second Punic war, and the violence with which other contractors defended the interests of the order in general, and the convicts in particular. But after the Macedonian war, the Roman citizen was relieved from direct taxes, the weight of which fell on the provincials. Associations of wealthy men were formed, who could give security to the Government, and who, being protected by the Government, could practise what extortion they pleased on the provincials. The law, indeed, provided that such persons should be liable to prosecution for corrupt and illegal practices, but the law was far too weak to check the malpractices of the officials. It appears that the province was divided into districts, or dioceses, as they are called, a manager being appointed for each district, who was in regular correspondence with the chief of the office at Rome. The law recognized the guild of the publicans, who were indeed, by their agency, the centre of the Roman system of finance, and in many emergencies the parties with whom the state negotiated for an advance on the security of its revenues. But, on the other hand, it was said with too much truth that where the tax-gatherer appeared public law and private liberty vanished.

Taxes paid in kind were the tenth of corn and the fifth of fruit. Such taxes were imposed in Sicily, in Africa, in Sardinia, and in Egypt. Spain was treated more generously, partly to compensate for the reputed unproductiveness of its soil, partly in all likelihood from fear of the high-spirited character of its inhabitants. In some cases, the contributor of the tithe had to carry his quota to the nearest port for shipment to Rome. The rest of the empire paid money taxes, partly from an assessment on the value of property, partly by what appears to be a poll tax, but was really an artificial estimate, under which several needy persons might be made to represent a unit, and on the other hand one wealthy person might be treated as many units. The assessment lasted for a definite period, which, in the age of Constantine at least, got the name of the Indiction. In the sense of a tax, this term is as old as Pliny, if indeed it cannot be carried back to the early empire.

The finance of the Roman empire imposed a tax on the profits of trade, which seems to have been collected with great severity, and to have exposed those who were liable to it to strict scrutiny, and to degrading punishments in case of default. Capitation taxes were levied on cattle, on imports and exports, on slaves kept for the purpose of luxury, on auctions (1 per cent.), on sales in the public markets, analogous to the octroi in the French towns, on salt works, on emancipated slaves, and on successions in cases where the inheritance went by devise to strangers. The Roman empire even anticipated the benevolences of the Plantagenet and Stuart kings of England in the coronary gold, which was first received as a present on the occasion of a triumph, but afterwards exacted as a right on such occurrences as the emperor might choose to proclaim.

The distinction of Roman and provincial was merged in a common servitude under the edict of Caracalla, which conferred the Roman franchise upon all the subjects of the empire. The task of collecting and transmitting the taxes from the provinces to Rome, and subsequently to Constantinople, was imposed on the decurions, the senate of the colonies. These persons exercised what little authority was left to the local magistracy by the centralization and despotism of the empire, and were exempted from some of the more degrading punishments which were imposed on the mass of the people. But they bought their rank and privileges at a dear rate. They were liable, in case they failed to collect it, to the whole impost which was assessed on the locality whose affairs they administered. To escape from the dignity and responsibility of the decurion's office, without sinking into the condition of an unprotected citizen, was the object of numerous petitions to the emperor. The privilege was occasionally, sometimes lavishly, awarded as a matter of special favor. But the necessities of the public revenue demanded that enough decurions should be left for the purpose of meeting the burden of taxation. Hence, under the financial system of the later empire, the weight of fiscal charges fell with increasing severity on the middle classes, so that at last, when the military system of Rome collapsed, nothing remained to withstand the assaults of the barbarian invaders. One is struck at finding how small are the armies which subverted the Roman empire, and how easily they occupied Gaul, Spain, and northern Italy.

The fiscal and military system of the Roman empire caused the downfall of ancient civilization. The Roman army and the Roman exchequer were developments from a centralized despotism. The army exhausted the free growth of Italy, devoured the population of those most warlike races who were successively allowed to recruit the Roman legions; and when the subject races, from which new blood could be introduced into the forces, were thoroughly drained, the Government was forced to enlist soldiers from those foreign hordes who were already threatening, and were soon about to overthrow the empire. Civil society was simultaneously crushed by a prodigious weight of taxation, arbitrarily imposed, and rigorously exacted. Before the final collapse occurred, wide regions, once occupied by opulent and populous cities, were found to be destitute of inhabitants, and released from taxation on the plea that there was no population left from which to collect a revenue. Large tracts of Asia, southern Europe, and northern Africa have never recovered from the desolating effects which were induced on them by the fiscal and military policy of imperial Rome. A great break occurred in the history of human progress. Social development was thrown back for centuries, and in some particulars has not even yet recovered the ground on which it stood in the first century before our present era. Not a few fragments, too, survive from that imperial system which was the downfall of ancient civilization, and which will remain an impediment to modern civilization until they are completely taken out of the societies in which they have been embedded.

The history and progress of modern finance may be best studied in English fiscal history. Some countries, as Holland, adopted expedients in finance long before other states understood or accepted them; others, as France, have been informed by many acute authors of the means by which a sounder, fairer, and more productive fiscal system might be adopted in place of one which was ruinous, oppressive, and unproductive. But in England only theory and practice have gone on together,—not indeed simultaneously, for the English legislature has accepted scientific principles with hesitation and slowness, but progressively, the result being a compromise, which is open indeed to serious criticism from the point of view of the economist, but is, under existing circumstances, of easy manipulation to the financier. Into the former of these we do not propose to enter; it will be treated under TAXATION; but the latter can be presented from an historical point of view.

English finance is historically connected with the foundation and growth of the English exchequer. It is further divisible into two periods,—one in which almost the whole income of the sovereign, acting for the state, was derived from direct taxation; another in which a continually increasing revenue has been obtained from the indirect taxation of consumable articles. The dividing line in these two systems is the civil war of the 17th century; and it may be affirmed confidently that nothing but the emergencies of a great convulsion like that of the parliamentary war could have reconciled the English people to so total a change in the system of taxation as the adoption of the excise was. For more than a century after the compromise was effected, of which the perpetual or, as it was called at first, the hereditary excise was the outcome, the impost was detested. A generation has hardly passed away since offences against the excise have ceased to command public sympathy, and, despite the severity with which the law treated frauds on the revenue, have been looked on as venial acts, detection in which was rather thought unlucky than scandalous. We no doubt owe the change in public sentiment, in accordance with which frauds on the excise are considered criminal, to the happy change in the fiscal policy of the country, under which taxes are imposed for the purposes of revenue only, and are no longer seen to be protective or partial.

The origin of the English exchequer is variously ascribed to William the Norman and his youngest son Henry I. It is certain that the great cadastre of Domesday Book, the terrier of inhabited England, was treated as the register of the exchequer, the authority of which, as a record of the crown's title to lands and services, and of the subjects' tenure, was held in the exchequer court to be conclusive. It is also certain that whatever arrangement may have been made by the first and third Norman kings, the system was suspended during the troubles of Stephen's reign, and that the exchequer was reconstructed by Henry II. It appears, too, that the machinery of the exchequer was perfected by a family of clerical financiers, who held at once high dignities in the church and confidential offices in the state; that they were, and avowed themselves to be, eager advocates of regal rights; and that they strove to extend, as far as possible, the liabilities and responsibilities of the subject towards the crown. They also found means by which the judicial powers of the crown, the protection which the powers of police wielded by the crown could afford to the subject, and even the validity of contracts, were made the machinery for securing a revenue.

The Norman and Plantagenet kings were not only the overlords of all their subjects, and therefore interested in the escheat of their estates by failure of heirs, but by far the largest landholders in the country. The royal estates were managed, at least in the 13th and 14th centuries, just as the estates of the nobles and gentry were. They were superintended by bailiffs, generally of very low social rank, and cultivated by customary and hired labor. The profits of the estate, as long as this system was continued, were paid into the exchequer by the bailiffs, and after the king ceased to cultivate land with his own stock and capital, the collectors of rents succeeded to similar duties with those of the more ancient bailiffs. The sheriffs collected the customary charges which were imposed on the counties, and the extraordinary receipts of the crown, making audit of their liabilities twice a year, and receiving a quittance when those liabilities were discharged. Careful search was made into the estates of deceased tenants of the crown, and the antiquary or genealogist has derived the largest amount of his information as to family and local history from the numerous and exact *inquisitiones post mortem* which were taken by the proper authorities. As certain offences involved a forfeiture, and as all offences might be condoned by the payment of mulcts, the attention of the royal officials was stimulated to all such cases of misconduct, and except in matters of petty police, adjudicated in the manorial courts, the royal tribunals rapidly superseded private jurisdictions. In England these private jurisdictions disappear in the middle of the 14th century; in Scotland they survived till they were abolished after the insurrection in 1745; in France they existed till the eve of the Revolution. Nothing has tended so much to develop English nationality, and to consolidate the authority of the crown, as the royal tribunals, working through and for the machinery of the exchequer.

As the King's Bench dealt with pleas of the crown, when the king's peace was broken, and the exchequer hunted up and punished offences against the revenue, and through both agencies assisted the revenue, so a further source of royal income was derived from the fees levied for the administration of justice between subject and subject. There are many forms of conveyance known to those who are curious in legal antiquities. But the court of Common Pleas competed against them, by recognizing a form of conveyance transacted in court, recorded, and thereupon protected by valid evidence of title. "No assurances," said Clarendon, when, in the full tide of revived loyalty, the cavaliers of the Restoration strove to reverse or make void disadvantageous or forced sales made by themselves during the course of the civil wars, "are equal in validity to titles created by fines," as these kinds of conveyances were called. "There is no precedent of their being vacated by judgment or Act of Parliament, or otherwise, without the consent of the parties." So conclusive was this form of conveyance, that when Viscount Purbeck surrendered his title to the king by the process of a fine, the Lords, though they protested against the act, did not venture on demanding that it should be void. This form of conveyance also supplied a revenue to the crown. The exchequer, in short, was ubiquitous, constantly searching after means by which the finances of the crown could be recruited or enlarged, and sometimes offering very solid advantages to the subject in return for business of which the law courts, centred in the exchequer, took cognizance.

Besides these revenues, the crown derived an income from the corporations whose charters were granted in lieu of annual payments, and were renewed on further payments. Sometimes the accession of a new sovereign was made the the ground for fresh demands on the re-grant of charters, and payment was always expected for the concession of new rights. All these receipts, from whatever sources derived, were entered in the annual registers, the great rolls of the Pipe, a series of documents still preserved, and extending without break from early in the reign of Henry II. down to the reign of William IV., when offices, long obsolete, and already mere sinecures, were abolished. But for nearly seven centuries the financial history of England is contained in an unbroken series of public records, carefully made up from year to year, and as carefully audited. And as the receipts of the exchequer were exactly scheduled, so the payments were checked. No mere order, even of the sovereign, was valid for payment, unless it were countersigned by some official—originally the treasurer—and therefore duly subjected to a formal examination.

It is reasonable to conclude that arbitrary taxation was, if not unknown, always unconstitutional in England. The strict definition of the crown's rights in relation to revenue, which Domesday Book defended, and which the exchequer interpreted, naturally suggests that the rights of the subject were equally acknowledged and intelligible. Hence it was a general opinion, pretty freely expressed when the administration was unpopular, that the king should live within that income, in ordinary times at least, which had, under good management, been found sufficient for the dignity of the crown, and the good government of the kingdom. The risk of the crown's impoverishment, and the consequent necessity of grants from the subject, made the English people exceedingly hostile to favorites, and led parliaments to recommend or even insist on a resumption of grants. The improvidence of Henry III. led to the Barons' War. The worse improvidence of Henry VI.'s administration, when the crown was in abject penury, was a principal stimulant to the party of the duke of York. The last echo of this discontent was the dissatisfaction felt at the grants made by William III. to the Bentincks and the Keppels, grants which had to be revoked in part, and which were only confirmed in part by the adroit manner in which the Whigs proposed to extend the same resumption to the estates bestowed on the numerous illegitimate children of Charles II.

One financial expedient, however, adopted, as is supposed, at the instigation of Becket, and certainly introduced in the middle of the 12th century, had such lasting and peculiar effects on the fiscal and political system of the country that it should be explained. This was the commutation of foreign military service for a fixed money payment.

The policy of Henry II. was to strengthen the revenue, and to make it the instrument of government. Beyond his immediate and obvious interests, the warning which he derived from the straits to which his great rival Louis VII. was constantly reduced was enough to make him eager to secure and perpetuate the means for carrying out his own designs. The expedient on which he hit led to three results, two of which had an overwhelming influence on the mediæval history of England and of western Europe, while in the third was contained the solution of the greatest problem with which civilization has had to grapple, which ancient politics failed to grasp, but which is the great victory of modern politics. The commutation of foreign military service for a fixed money payment was, first, the cause why the Norman settler and the subject Englishman rapidly developed a common sentiment against the royal prerogative; was, secondly, the origin of that irresistible English army before which, till it was rivalled by the Swiss infantry, no feudal levy could hold its ground; and, thirdly, was the unwilling parent of representative government, of parliamentary control, and finally of scientific finance.

The king, under that system of reciprocal obligation between overlord and tenant which is called, somewhat loosely, feudalism, had a right to the military service of such among his subjects as held lands by military tenure. Sometimes, to be sure, as in France and Germany in the 11th and 12th centuries, the suzerain was not in a position to enforce the obligation; sometimes, as in the kingdom of Jerusalem, the obligation was rendered stringent by the necessity of defence against a common enemy. It would seem that the position of the English king and Norman duke was intermediate to the above. There was no doubt that he could call on his subjects in England to do battle on behalf of interests which were indisputably insular, his Norman subjects for such interests as were indisputably continental. But it was not quite so clear that an English tenant was bound to defend the transmarine interests of the English king, or that a Norman, a Gascon, or Languedoc tenant should be constrained to vindicate the English rights of a Norman duke. But there was so much to be said on behalf of the king's claim that a compromise was possible, and it was so much to the advantage of the English monarch that such a compromise should be made, that the bargain known as escuage or scutage was struck between the English king and his barons.

Military service rendered by a military tenant was a tax in kind. In 1158 Henry II. laid claim to the great fief of Toulouse in right of his wife. If this fief could be transmitted through females, his claim, according to the public law of the time, was good. But another family had been in possession for nearly a century, and it was plainly inexpedient to the French king that his dominions should be completely girdled round, from Flanders to the Alps, by the fiefs of the English king, who, by various titles, had inherited or claimed the whole seaboard of France. The recovery, therefore, of the fief of Toulouse was sure to be an arduous task, and in effect Henry did not achieve it. But by bargaining for a money payment instead of personal service he could supply himself with the most effective means towards the object aimed at. A feudal army was collected slowly, was destitute of solid organization, and was at once disbanded when the time of its service was passed. An enlisted army, paid and commanded by the sovereign, gathered by careful selection, and drilled with all the skill which the age possessed, was a far more efficient instrument of warfare.

The assize of arms under which the militia was enrolled defined the equipment of the national forces as precisely as those of Rome were defined under the so-called constitution of Servius. Each social order had its proper arms and place in the army. None but freemen were entitled to serve. But in the king's enlisted army a serf could be enrolled, and rise to knighthood and even to nobility. During the long wars of Edward III. many such persons of originally ignoble birth became distinguished captains. The royal army became, like the church, the road by which humble merit might be promoted to rank and affluence. Such an army, was highly paid, well drilled, rapidly manœuvred, and prodigiously effective. Though small, it easily routed hosts many times greater in numbers than itself. The chivalry of France went down before the English footmen at Crecy, Poitiers, Agincourt, and Verneuil, as the Persian armies were destroyed at Granicus, Issus, and Arbela, and as the native forces of India were routed at Plassy or Assaye. It is true that these English victories were ultimately barren, because the victors were too few to hold the country which they conquered. But in action, as long as the army was true to its drill and discipline, it was irresistible, and could only be beaten or dislodged in detail. Perhaps it is not too much to say that the tradition of these exploits has had a permanent effect.

Again, the commutation first adopted in 1158 united the two races, Norman and English, in a common policy. In accordance with the spirit of the time the bargain was a record and a precedent. If it strengthened the king's military power, it weakened his civil power. The feudal chieftain might not be unwilling to undertake a campaign from which he might get plunder or glory, or the solid advantages of successful and appreciated service. But it was another thing to find the funds from which others might be hired, and drilled, and win these advantages. The military tenant began to criticise the sovereign's policy in undertaking foreign wars, and to demur to his demands for escuage. His natural ally against the power of the crown was the free peasant. In little more than half a century after the bargain which Becket made with the military tenants of the crown, the whole nation, churchmen, nobles, burghers, and peasants, were united against John and his mercenaries, forced the Great Charter from him, and despite the anathemas of the most powerful pope which ever sa at Rome, insisted that the Charter should be maintained The history of no European nation supplies a parallel to the events of 1215. It will be found also that this common purpose influenced the minds of all ranks of Englishmen, till, under the unhappy reign of Henry VI., the feuds of the nobles made havoc of English liberty for a century and a half. But it was during the period of national resistance to the excesses of prerogative, *i. e.*, during the 13th, 14th, and the first half of the 15th century, that those precedents were created which served the parliamentary opposition of the 17th century to such good purpose.

In the third place, the commutation of personal service was the true cause of parliamentary representation. It is known that the earliest traces of representation are to be found in those elections of county knights who were appointed to assess the contributions for extraordinary necessities which the irregular councils or assemblies of the earlier Plantagenet kings had conceded. From local or county assessments to a national or general assessment, based on uniform principles, was only a step. At first there was no need that any but the country districts should be dealt with in this fashion. The resources and liabilities of the towns were well known, and the king could treat directly with the borough authorities. These relations of the crown to the chartered boroughs is the explanation of those anomalous franchises which characterized so many of the boroughs before the Reform Act of 1832. At last, in 1265, Simon de Montfort summoned the representatives of the boroughs as well as the counties, avowedly for the purpose of obtaining their adhesion to his policy, and the precedent was copied thirty years later by Edward I.

How the parliament gradually, through its control over the supply of funds for the extraordinary necessities of the crown, undertook the cognizance and remedy of abuses, assumed legislative functions, affirmed its own privileges, debated political questions, changed or determined the succession to the crown, extended or narrowed the franchises of the electors, and criticised the royal administration and expenditure, is matter of familiar history. The origin of the English parliament was peculiar, as its place in modern European history was unique, till, at the conclusion of the 18th century, other countries began to imitate the forms and traditions of the English constitution, and at last a free parliament has become a symbol and condition of constitutiona government.

It has been stated that finance, during the Plantagenet and Tudor dynasties, consisted mainly in the occasional imposition of direct taxes. The crown made known its necessities, and the parliament declared the amount of supply. At a period which is not settled, the right or duty of originating supply became vested in the lower chamber. It is probable that this great privilege, to which the House of Commons owes its ascendency, but which was formally conceded only in the reign of Charles II., was partly due to the willingness of the Lords to throw on the lower chamber the odium or danger of refusing or cutting down the demands of the crown, partly to the original character of parliamentary representation,—the fact, namely, that it was called into being for the purpose of assessment. In course of time, the House of Commons assumed the right of giving validity to the grants of the clergy in their Convocations, a right which they angrily affirmed in the first session of the Long Parliament. Here, again, it is probable that the clergy had, at some period which cannot be now defined, attempted to protect themselves against the heavy demands of the king by putting their grants under the sanction of the popular chamber.

The direct taxes of the Plantagenet and Tudor times were percentages on the annual value of lands and tenements, property taxes strictly so called on personal estate, and percentages on ecclesiastical revenues. The first two were granted by the secular, the last by the clerical parliament. Very early in the history of English finance, the district from which the tax was raised was assessed, and the assessment was made a permanent valuation. It seems that this was even done with the tax on personalty. The town, for instance, from which the tax was collected was set down at a fixed sum, and the sum thus fixed was raised *ratably* by the local authorities. Hence in the time of James I. the subsidies and fifteenths, as the direct taxes on real and personal property were called, produced less than they did more than three centuries before, though the money of the Stuart sovereign contained only one third of the specie which was coined in pieces bearing the same name in the 13th century, and prices had risen owing to the increasing cheapness with which silver was obtained. It is likely that the motive for maintaining the same assessment was that parliament might exactly understand the amount of the burden, and the extent of the aid given to the king. The taxing rolls in which the amounts levied are set down exist by thousands in the national archives, and might be made the material for illustrating the social condition and opulence of mediæval England. Similarly the value of benefices was assessed and remained constant, the tax levied being a percentage on the nominal value as entered on the books of the pope or the king.

The tax levied on the clergy was always a higher percentage than that imposed on the laity. It was reasonably argued that a tax on tithes was a lighter burden than a tax on products or annual value, since the tithe-owner had contributed neither in labor nor capital to his share in the produce. Hence Edward I. demanded, in 1296, an enormous percentage—a third—on the revenues of the clergy. The clergy had procured a bull from Boniface VIII., under which they were forbidden to pay taxes to lay persons. That this bull was obtained at their solicitation seems manifest, since the crown was in want of money for carrying on war with Philip the Fair, with whom the pope was at constant feud, and against whom he would be likely to support any enemy. The attitude which Edward instantly assumed towards the clergy, the success which attended his policy, and the serious diminution in their privileges and prestige which followed from the expedient so unluckily adopted, are matters of familiar history. From the time of Edward there are only faint and occasional signs of that clerical independence which had exhibited such vigor in earlier times. During the 15th century the clergy had ceased to be a separate power in the state, though they exercised a great conservative influence in the obscure politics of the Lancastrian and Yorkist period.

Sometimes the king received taxes in kind, especially in wool, the principal export of English produce. It appears that sheep-feeding was almost confined to England, probably because the peace was better kept in England than elsewhere, and destitution was nearly unknown. Hence it was possible to put a heavy export duty on the produce, or, what was the same in effect, to sell it at a much higher price than it was purchased at, by assuming a temporary monopoly of the article. Such an expedient was adopted by Edward I. in 1297, and several times over by Edward III. The importance of English wool to the Flemish manufactures was so great, and the trade was so easily manipulated by the English government, that, from the time of Edward I. till that of Henry VII., *i.e.*, during two centuries, the political sympathies of the Flemish were easily secured on the side of England through the agency of commercial intercourse. When Margaret of Burgundy gave a refuge to the Yorkist exiles, and sent forth pretenders to disturb the throne of Henry Tudor, the negotiation of a commercial treaty with Flanders, the Intercursus Magnus, formed an effectual bar to her intrigues.

The direct taxes of the period before us were doled out sparingly and grudgingly. Sometimes, as in the minority of Richard II., they were appropriated, to use a modern phrase, by the hands of a body of commissioners appointed for the purpose. On the occasion referred to, Sir Richard Whittington was one of the persons selected to see that the moneys granted were duly applied to the war with France. It may also be stated that munitions for the defence of Cherbourg, saltpetre and sulphur, were sold to the Government of this time by Sir William Walworth, well known in history as the slayer of Wat Tyler, the leader of the Kentish insurgents in the peasants' war. It is almost superfluous to say, that supply was granted on the condition that the grievances were redressed. In the early part of the 15th century, when it was seen that the officials of the court evaded the redress of that which the Commons prayed for and paid for, the practice became general of drawing up petitions in the form of bills, and thus of making the redress of grievances the basis of a legislative act.

It is a commonplace with historians to assert that the right of the crown to purveyance, *i.e.*, to provisions and labor, purchased at market rates, or distrained for royal works, was a serious grievance in the Middle Ages. There is no evidence that it was so. The present writer has read many thousands of mediæval accounts, and has rarely found that the forced purchases of the crown were treated as a wrong. Sometimes a great courtier, such as was the younger Despencer in the reign of Edward II., usurped a right which belonged to the crown, and injured the proprietor. But, as a rule, the crown paid its way honestly during the Plantagenet period. It was especially in the reign of the first two Stuarts that the grievance of purveyance was felt. But the discontent was due to the fact that the crown had determined on paying for supplies at the old rates of value which prevailed before the currency was changed and prices had risen. Such a system put on the county, through the justices at quarter sessions, the cost of the difference between nominal and market rates: and the crown, when the supplies were not forthcoming from the county, purchased on its own account, and forced the county to pay extravagant, perhaps factitious, prices for that which it had failed to purvey. An additional cause of discontent was found in the fact that, though purveyance was claimable only while the king was in the district, the Stuart kings demanded the contribution when the court was in London, or at any rate at some distance from the locality which was charged, and often overcharged for default.

In the 14th century a practice of making voluntary gifts to the crown began. Stories are told of Pole and Whittington having made presents or loans to the king, and of the latter having cancelled the king's debts at a banquet which he gave to his sovereign. In the 15th century the voluntary gifts of rich men were modified into a system of begging, under the name of a benevolence. It is probable that the extreme poverty of the crown during the latter years of Henry VI.'s reign, and the growth of partisan spirit among the nobles and gentry of this time, may have led to the practice becoming common. At any rate the custom became general during the twenty-five years of Yorkist ascendency. That it was exceedingly unpopular is shown by an Act of Richard III.'s single parliament, in which benevolences were declared illegal. The successors of the usurper pretended to treat this statute as inoperative since it was enacted during an illegal government. Henry VII. and his successors constantly supplemented their revenues by benevolences. Chancellor Morton's fork, by which parsimonious and expensive opulence were equally invited to aid the king's necessities,—the one out of savings, the other out of expenditure,—is well known. The practice continued down to the eve of the Long Parliament, if indeed it can be said to have ceased, as far as the Royalist party was concerned, before the final collapse of Charles I.'s fortunes at Naseby. It was a commonplace with the courtiers of the day that the king might, if he wished, take the subject's wealth without asking leave. On the other hand, they who refused professed that they were restrained from giving by the anathemas of the Great Charter, by which those were denounced who violated any of the provisions which the Great Charter contained, and notably that by which common assent must be accorded to taxation. Anticipations of revenue by loans were common. The foolish project of Henry III., which was set on foot in order to secure the throne of Sicily for his second son, more accurately in order to enable the pope to crush the reigning members of the house of Swabia, loaded the king with debt, and, forcing him to consult his nobles as to the means of liquidating his obligations, gave an occasion for Simon de Montfort's abortive political and financial reforms. The long wars of Edward III. compelled him to make loans, and ultimately to repudiate his debts; and we are told that his bankruptcy brought down some of the most opulent financial houses in Florence. Henry VIII., who squandered the enormous treasure which his father had accumulated, and afterwards the great personal estates of the church, and finally its lands, —reputed, and perhaps with reason, to have been, in the wealthiest age of its existence, one-third of the fertile land in the kingdom,—constantly incurred large debts, from which he was relieved by his obsequious parliaments. Charles and his son incurred debts which were never paid, and Macaulay does not misstate the case when he says that public debt was not incurred for the first time at the Revolution; what did happen was the satisfaction of the obligation to pay the interest and, if possible, the principal.

One of the financial expedients of the Middle Ages, and indeed of much later times, was a depreciation of the currency by means of issues which, nominally of the same value with an older issue, were intrinsically below it. This is not the place in which one might point out how disastrous and suicidal a policy it is to tamper with the currency, how mischievously the forces of Government are employed when they undertake this kind of fraud, and how enduring are the calamities which result from so great a political crime. Not a little of the stability and progress of England has been due to the fact that dishonesty on the part of Government in dealing falsely with the currency has been a very rare offence,—has, indeed, been committed only within a short but continuous period. The evil, however, which the action caused to England, even for so short a time, was so great that it reduced this country from the position of a first-rate to that of a third-rate power in Europe for more than a century.

At the close of the 13th century, the pound sterling contained what its name imported, a pound weight of silver, of 11·2 fineness,—the penny, which was the commonest coin, containing the 240th part of a pound. Between this period and the first quarter of the 16th century, the penny was reduced to one-third of its ancient weight. But there is reason to believe, from direct and indirect evidence, that it was the practice to pay by weight and not by tale. It is inconceivable that the crown would, for the sake of a temporary gain, have sacrificed the fixed or quit rents, which constituted, after the beginning of the 15th century, the greater part of the revenues raised from crown lands and regalian rights. Besides, the evidence of prices is conclusive as to the alternatives that the value of silver must either have quadrupled in the 15th century, or that payments must have been made by weight, for during three-fourths of the 15th century the prices of the necessaries of life are much lower than they are in the 14th. During the whole of this period, however, the coinage was kept to its customary standard of fineness, and therefore no uncertainty was induced upon pecuniary transactions.

In 1543 Henry VIII. commenced an issue of base coin. At first the alloy was only one-sixth of the silver; but in 1545 a second issue was put into circulation, in which the alloy was one-half, and in 1546 a third issue only contained one-third of silver. Henry died on January 28, 1547. The guardians of his son continued the practice during the first five years of his reign, coining money in 1547 which was only one-third fine, in 1549 of one-half fineness, and in 1551 of only one-fourth fineness. An attempt was made at the conclusion of this reign to issue a coinage of genuine quality, but as the base money continued in circulation, the attempt was futile. Mary was anxious to restore the ancient standard, but found it impossible to do so. Elizabeth called in her father's and brother's base money at a low fixed rate, which gave her a considerable profit, and put into circulation money of the old character and quality. This was effected in 1560, so that England suffered from the evils of a base currency for seventeen years. The effect was disastrous in the highest degree, for it impoverished the nation, and for a long time disabled it from filling that place in Europe which it had occupied for centuries before.

Among the sources of the royal revenue, the ancient customs of tonnage and poundage occupied an inconsiderable place. These were dues levied upon exports and imports, and seem to have been yielded from the earliest times. They are justified on the ground that the sovereign was under the obligation of maintaining the police of the narrow seas. Attempts of a more or less successful kind were made for the purpose of securing this part of the revenue by limiting exports and imports to certain towns, and particularly by fixing the market of exports in particular localities, known as towns of the staple. Thus, for a long time, Calais was by law the sole market of English wool, and the West of England tin was sold at Bodmin and some other Cornish towns. Towards the latter end of the 16th century the growth of foreign trade was rapid and considerable. But the old dues on exports and imports, which had been granted to the crown on the occasion of each accession from the 15th century, were small and inelastic. An attempt was therefore made to revise them, and in 1608 Cecil, James I.'s minister, drew up a new book of rates.

It is well known that these new taxes, for the imposition of which many plausible reasons were alleged, were the commencement of that quarrel between king and parliament which culminated in the civil war. The law courts decided in favor of the crown, and it does not appear that at this time the special scandal of the Stuart government,—the practice, namely, of displacing such judges as gave decisions on points of constitutional law or public justice that were distasteful to the sovereign,—had commenced. But, on the other hand, it was seen clearly enough that, if the crown could, at its own discretion, impose what taxes it pleased on trade, the checks which parliament might impose on the administration would be annihilated. In point of fact, the Book of Rates had very much this effect. Practically there was no parliament between 1610 and 1621, for the parliament of 1611 was dissolved without passing a bill or making a grant. But in the latter part of this period, owing to the skill and energy of Cranfield, the first of English financiers, the king was relieved from his debts, and put in possession of a revenue which was independent of parliamentary supply under ordinary circumstances. The election of 1621 was simply due to the outbreak of the Thirty Years' War, and the disastrous condition to which the king's son-in-law was reduced.

Another expedient by which the crown strove to increase its fiscal receipts was the grant of monopolies. It seems that the creation of a trading company, and the accord of special privileges to those who founded a market in those regions which were opened up to trade by the discovery of the Cape passage and the New World, was deemed to be incontestably the province of the crown. The houses of parliament could not have ventured on criticising the action of a chartered company, much less have pretended to define its privileges. Now the papal see had granted to Spain the whole of the New World, or at least such parts of it as were in any way inviting, and had made a similar grant to Portugal of the district which lay on the road to India. By the death of Cardinal Henry in 1580, the succession of Portugal passed to Philip II., who thus united under one rule the West and the East. But the Dutch were now engaged in the War of Independence, and were assisted by the English, though war had not actually broken out between England and Spain. The war came at last, and the eastern possessions of Spain were obviously the most convenient spot in which the power of Spain might be attacked. There was every reason, then, in according trade privileges to a company which had to contend against the power of Spain, to build forts and factories in which trade could be secured and extended, and to deal discreetly with rivals who were associated with Protestant England by a common European interest, but were sooner or later to come into collision in more distant regions. The massacre of Amboyna was the beginning of those differences which culminated in the wars with Holland during the protectorate and after the monarchy was restored. On December 31, 1600, the first East India Company was created by charter. So far was the revenue from being the better for this charter that the queen granted the company an exemption from customs duties for the first four of their voyages.

From the undisputed power of granting charters for the monopoly of foreign trade there was only a step to the grant of monopolies to the home trade, though of course always on the plea that the monopoly was really a control which it was in the public interest to exercise. It is well known that, when these monopolies caused discontent, Elizabeth graciously cancelled them. They were renewed by James, were again the subject of remonstrance, and were abandoned by the king with so little conciliation that the surrender of the practice gave no great ground for gratitude. The other fiscal expedients which James adopted were the creation of a new title which was conferred by purchase, the sale of peerages, and the rigorous exaction of feudal rights. In the parliament of 1610 an attempt was made to cancel these rights by commuting them for a fixed payment, which, if the scheme had been accepted, would have taken the form of a quit rent on all estates held on military service by tenants of the crown. But the scheme failed, probably as much from a disinclination on the part of the parliament to aid the prerogative by granting the king a fixed revenue, as from any dispute over the amount of the commutation. The whole subject has been ably and judiciously treated by Mr. Gardiner, whose conscientious and painstaking histories of the earlier Stuart period are of the utmost value to the student of finance and politics.

Hitherto, the history of English finance has been that of the process by which the Government attempted, with more or less success, to derive a revenue from direct taxation. Cecil and James I. discovered that a fruitful source of increased revenue was to be found in the customs and a new book of rates, and the Commons as clearly saw that in this fiscal expedient lay the whole issue of the debate between parliamentary control and the royal prerogative. The struggle began with the accession of Charles. The independence and privileges of parliament, the desire to obtain certain guarantees for that kind of church government which represented the dominant feeling of most Englishmen, were the objects of those who constituted the parliamentary opposition to the court; but the machinery by which these results were to be effected was finance. No one can understand the politics of the first fifteen years of Charles I.'s reign who does not detect that the parliament intended to bring the king to terms by stinting the revenue. The struggle began with the first parliament of Charles. The parliamentary leaders imagined that they had won the victory when they secured the Petition of Right. The king interpreted that concession in another way, and was supported by legal advice in the view which he took. During the long interval between the third and fifth parliaments of Charles, the king tried every expedient by which to raise a revenue. Clarendon's statement that the country was peculiarly prosperous between 1629 and 1640 is undoubtedly correct. But the country determined not to let Charles have his way, and the resistance to his financial expedients was only the prelude to those measures which the Long Parliament at once adopted when it met.

During the period which intervened between the dismissal of the third and the summons of the fourth parliament, Charles adopted various fiscal expedients in order to fill up the deficiency of his finances. They were all, except the rates levied on imports and exports, forms of direct taxation. Such were the compositions in lieu of knighthood, the annual payments made by chartered monopolies, the resumption of lands which were said to be encroachments on the royal forests, the fines of the Star Chamber, and in particular the fine of £70,000 imposed on the city of London, and lastly ship-money.

In the earliest times, the maritime towns, and especially the ports in the south-east of England, were liable to be charged with the duty of the national defence at sea. The privileges of the Cinque Ports were connected with this duty of defence, and it appears that the sailors of these ports needed very little persuasion to undertake a duty in which privateering differed little from piracy. Sometimes these irregular forces did good service. The victory of the Cinque Ports over Eustace the Monk in 1216 had even more important results than the battle of Lincoln. The navy of Philip of Valois was annihilated at the battle of Sluys by the same kind of force, and Edward III. was freed from rivalry on sea. In later times the piratical ventures of Hawkins and Drake had royal patronage, and it is said that some of the families who purchased titles from James I.—notably the Riches—had gained their wealth by expedients very similar to those which were familiar to the Algerines, and that their expeditions were as equivocal as those of the Mediterranean pirates. Not a few men who had won their wealth as buccaneers spent a calm and respectable old age in England. There was no hardship felt in the demand occasionally made by the crown, that the seaboard towns and counties must defend the realm at sea.

The first writs of ship-money in 1634 were levied on the maritime counties only. The second and third of 1635 and 1636 were imposed on the inland counties as well, the judges affirming, at first privately, and afterwards, on Hampden's appeal, by a majority, that the crown could levy the tax at its discretion and without the consent of parliament. It seems that the tax yielded about £200,000, though it is said that after the judgment in Hampden's case, the payments were more reluctant and irregular than they were before the judges affirmed the legality of the impost.

The civil war broke out in the autumn of 1642. The king was better off for soldiers, the parliament better off for money, and in the end the possession of adequate funds supplied the means by which the single advantage which the king possessed was neutralized. These were afforded by the new forces which Cromwell drilled effectively and paid highly. Not only was London, always in the interest of Parliament, richer than all the towns in England put together; not only was the eastern district of England untouched by the war; but Norfolk was by far the most wealthy and populous district in England, as Yorkshire and Lancashrire were the poorest and least populous. The resources, therefore, from which the parliament could procure its means were ample and easily obtained.

In 1643 the parliament imposed an excise on beer and ale within all the counties which acknowledged their authority. They also levied a heavy tax on tobacco and wine, and on other articles of consumption. The project was denounced by the king as an act of unheard-of oppression, but was soon imitated in the royalist district by the parliament which sat at Oxford, though, after it had made this grant, it did not meet again. In 1646 the parliament abolished the old feudal dues, turning all tenures into common socage. It is said that between the outbreak of the civil war and the year 1647 the parliament raised more than forty millions in the counties which they governed. Among other expedients, the Protector in 1656 established a general post office. According to the theory advocated by the crown lawyers at the Restoration, that all acts of the parliament from the date of the rupture with the king in the summer of 1642 were void, the old feudal liabilities were revived with the monarchy, and also, by implication, the royal privilege of purveyance. But as the country had been quit of these liabilities for fourteen years, the revival was felt to be an intolerable burden, and by 12 Charles II. cap. 12 they were extinguished. In common justice this emancipation should have been compensated according to the bargain nearly completed in 1610, which was known as "the great contract," by a land tax specially levied on lands which had hitherto been subject to feudal dues, and such an arrangement was proposed. But the cavalier party, now in the ascendant, contrived by a bare majority to carry a measure by which the king obtained the hereditary excise in lieu of his feudal dues, duties being imposed on beer, cider, perry, mead, spirits, coffee, tea, sherbet, and chocolate. Parliament also gave the king the old tonnage and poundage for life.

The excise was an expedient borrowed from the Dutch. In the long War of Independence the people of Holland were constrained to make great loans, and to pledge their revenues to pay interest on these loans. The debt was almost all held in the country, and to meet the charges the Dutch financiers imposed taxes on all articles of consumption, whether necessaries or luxuries, on commercial transactions, on births, marriages, and deaths, on successions and legacies. A Dutchman in the 17th century was taxed from the cradle to the grave, and the expedients of the Dutch financiers formed for a long time a series of precedents from which other countries borrowed largely. In effect Holland was the source of modern finance, and proved how taxation, though apparently of crushing weight, could be easily endured, if it were counterbalanced by industry and thrift. In point of fact, only a few years after the disastrous war with the English Commonwealth (a war waged quite as much for the political reason that the Dutch democracy, always inclined to the House of Orange, which was connected by marriage with the Stuarts, favored the English exiles, and insulted or even murdered the English envoys, as from motives of commercial rivalry), the state of Holland contrived to reduce the interest on its debt of nearly fourteen millions sterling from five to four per cent.

by the threat of paying off the principal. In the same period this state established, for the first time, a genuine sinking fund, by which, principal and interest being paid together, the debt of fourteen millions was to be completely extinguished in twenty-one years. The rate of interest in England at this time was eight per cent.

During the reign of Charles II. the English nation increased greatly in opulence, especially through its foreign trade. But its internal trade and industry suffered severely by the appropriation in 1672 of the goldsmiths' loans. The goldsmiths of London, who during the civil war had undertaken the office of bankers to the London merchants, and took in money at call, or at short notice on rates of interest, had lent these deposits to Charles, in anticipation of revenue, to the amount of more than a million and a quarter, at eight per cent. At the instigation of the Lord High Treasurer Clifford, the king suspended the payment of interest on this loan, for one year only, as he said. But the obligation was never acknowledged, and in 1701, nearly thirty years after the exchequer was shut up, the bankers' debt was treated as a national debt, on which three per cent. interest was to be paid, but which might be redeemed on the payment of a moiety of the principal. It is the oldest portion of the English public debt. In 1720 it became part of the South Sea stock.

Finance became a science in England at the Revolution. The immediate effect of the deposition of James was an alliance between England, Germany, Spain, and Holland, and a declaration of war against France. The war lasted for rather more than eight years, and was concluded by the peace of Ryswick. Now the founders of the English Revolution were determined that for the future the crown should be dependent for its supplies on the pleasure of parliament, and especially that its foreign policy should be held in check by the control of supply. There was the greater reason for this policy at the moment, for it was quite understood that the expulsion of James implied war with France, and that such a war, carried on as it would be by the vigor and determination of William, must be prolonged and costly. In 1688 the revenue was derived from (1) tonnage and poundage, (2) the hereditary excise granted in lieu of the old feudal incidents, (3) the profits of the post office, (4) the hearth money, a house tax, and (5) the grants made in the parliament of 1685 for eight years. The income derived from these sources has been variously computed at two millions to two and a half millions, and the receipts from the excise and customs were steadily increasing. William was under the impression that this great revenue was vested at once in him by the change of the succession,—a view which was supported by several Whig lawyers, who urged that, as long as the late king lived, these duties were payable, but that they were to be enjoyed by his successor. But the political Whigs thought differently. They determined, and they carried without opposition, that a fixed revenue should be settled on the crown during time of peace, that this revenue should be divided into two portions, one for the household and the civil expenditure, the other for the public defence and other analogous charges. It is true that they must have contemplated the immediate contingency of war, and have known that the sum at which they fixed the revenue would be wholly inadequate for the emergencies which would arise; but they were affirming a principle which should be permanent, while the contingency to be dealt with was temporary. It appears that the attitude taken by the parliament gave deep and lasting offence to William, and that the distrust and dislike which marked the relations of crown and parliament during this reign, and prepared the reaction under Anne, had no other origin than the settlement of the revenue by the convention parliament.

The parliament further determined, once for all, to affirm a principle, occasionally acted on in past times, and fundamental to the concession of extraordinary grants, by which all supplies, other than the civil list and the hereditary estate of the crown, should be strictly appropriated to the objects for which they were granted. The demands of the crown in the Middle Ages were generally for public objects, in which the whole community was reputed to be interested, though sometimes, in accordance with the theory of the age, they were acknowledgments for favors received, petitions granted, or pardons allowed. They were therefore ordinarily granted to the exchequer, and no limit was put on the objects for which they were to be expended. But, as we have stated above, appropriations were made in the minority of Richard II. and of Henry VI., in the last year of James I., and pretty frequently after the Restoration, greatly to the disgust of some among the courtiers, who conceived that the prerogative of the crown was dangerously invaded if Charles were disabled from diverting parliamentary grants from special objects to those which the king might be pleased to select. But from the Revolution the Appropriation Act has always denounced severe penalties on any minister of state, or head of department, who converts supply voted from one branch of the service into any other direction. The trial of Lord Melville, in 1806, illustrates the manner in which a parliament, otherwise disposed to trust implicitly in the Government, resented the apparent breach of a fundamental principle in English finance.

The settlement of the revenue on William and Mary left the parliament in the possession of a surplus of £800,000, the difference between the grants made to James and the sums actually settled on the crown. But £200,000 of this was immediately remitted by the abolition of the hearth tax or chimney money. The nation had also incurred a debt to the Dutch of £600,000, which was repaid at once. To meet these charges, a sum of rather more than £400,000 was voted, to be raised by monthly instalments, and as a security for borrowing £370,000 at six per cent. in order to meet immediate requirements. The expedient of anticipating revenue by loans at short dates was very ancient, and is indeed obvious. At first, the Government of the Revolution, feeling its way cautiously, raised loans on short periods, at high rates of interest, and pledged particular taxes for the payment of the principal and interest. These taxes were—new excise duties, *i.e.*, taxes on consumption; a monthly assessment, *i.e.*, a direct tax on income; and a quarterly poll tax, which of course was graduated. A resolution was, moreover, passed by the House of Commons, by which it was proposed to lower the salaries of all officers under the crown to £500 a year maximum, with the exception of certain cases. It took no effect, and was indeed a mere expression of dissatisfaction at the enormous gains of official statesmen. Nothing tended to lower political morality during the latter part of the 17th and the whole of the 18th centuries so much as the enormous perquisites which officials enjoyed.

In 1693 a loan was raised on the basis of a tontine. This expedient was familiar to Italian fiananciers, and was probably suggested by the life loans of the papal Curia. It combined a limited security with the charms of survivorship,—a kind of lottery which is very often found to be attractive, unless, as is generally the case, the tontine is employed as a speculation by those who put selected lives into the loan. Tontines have been employed by English financiers as a means for raising money up to the beginning of the present century. On this occasion, when a million was advanced on the security of additional excises to be levied on beer and ale, interest was paid to all subscribers at the rate of ten per cent. for seven and a half years, after which date £70,000 per annum was to be divided among the survivors, till the number was reduced to seven, when the annuity of each was to revert to the public on his decease. In order to stimulate the operation of this loan, persons were allowed to nominate lives at ten per cent. on the capital invested on each life. Although the latter offer was equivalent to selling annuities at less than half their value, the loan was raised with difficulty. But the capital expedient of 1693 was the imposition of the land tax. Willing as the parliament was to extend the area of indirect taxation, it was impossible that landed estates should be allowed to go untaxed, especially as, within half a century, nearly all taxation had been derived from the contributions of land and property, and as it was remembered that the emancipation of the military tenancies was effected at the expense of the general public. But the Government did not venture on departing from the old principle under which the subsidies were collected, that of making certain local authorities responsible for the assessment, or rather of relieving them of all virtual responsibility. The tax was fixed at four shillings in the pound on the profits of land and personal estate, the latter being taken at six per cent. But from the very beginning the assessment was unequal. It is said that those districts which were favorable to the principles of the Revolution assessed themselves fully and fairly, but that those in which Jacobite views were in the ascendant greatly understated their liabilities. It appears, too, that the assessment of personal estate was soon lost sight of, or rather merged in an aggregate local charge. In point of fact, no revaluation was made. Hence the estimated rental of agricultural estates remained unaltered, and the assessment of the towns, which was also taken as a fixed quantity, was imposed on the owners of property, the capital of the townsfolk and traders being merged in the value of the premises. For example, if the assessment of a town was £1000 in 1693, this sum including both items in the land tax, the same assessment was charged whenever the full land tax was imposed. But the inhabitants of the town had the right of redistributing the fixed assessment on the property contained in the town, as the value of individual holdings was increased or diminished by the outlay of the owners, or the depreciation of the premises. The land taxes, therefore, in the county districts became virtually a secured rent payable to the crown; in the towns it became a tax on improvements, though the amount was not considerable enough to discourage improvement. It was Adam Smith's opinion that in his time there were districts in which the land tax was half what it professed to be, an impost of four shillings in the pound on rents. Since the great increase in the rent of land, owing to the great improvements which have been made in the art of agriculture, the land tax is nowhere heavy, and in some districts is trivial.

Taxes on the rent of land, or on its value as property to be rented, constitute a far larger percentage in the budget of foreign countries than they do in England. In the reign of William and Mary it is true that the land tax, where it was fairly assessed, was a very considerable impost, and the country gentlemen easily fell in with the pacific projects of Walpole, when he coupled them with the fact of a reduced land tax, and a prospect that the tax would be abrogated altogether. But as, owing to the increasing value of land, and the growth of the system of indirect taxation (the principal expedient of English financiers during the 18th and the first half of the 19th century), the land tax became absolutely and relatively a decreasing charge, taxes on the rent of land ceased to be an important element in the national budget. Adam Smith informs us that in Prussia the land tax on secular estates was from 20 to 25 per cent. of the revenue, on ecclesiastical 40 to 45. In some European countries lands held by a noble tenure were taxed at a slightly higher rate than those held by a base tenure. In France, on the other hand, lands held by a noble tenure and the lands of the clergy were exempt from land tax, while the burden of direct taxation fell exclusively on those held by a base tenure. The inequality of this system, its injury to the revenue, and the still greater wrong which it inflicted on those who were liable to the tax, were constantly commented on by those French writers who made finance their study, and particularly by the Economists, whose particular views on the nature of taxation were an exaggeration of what contained a serious and important truth. But the interests which profited by the inequality were too strong for any reform. They were at last sacrificed by a revolution, much of the bitterness and ferocity which accompanied the change having been unquestionably due to the sense of injustice felt at the extreme unfairness of the feudal taille.

The next expedient was that of borrowing money on lotteries. There are instances of state lotteries before the Revolution. One was drawn in 1568, with the object of improving the harbors; another was held in 1612 and subsequent years, for the benefit of the Virginian colonists. But the parliament of 1620 presented these lotteries as a grievance, and they were discontinued by an order in council. In these later lotteries the Government found it impossible to dispose of the tickets except by granting at the same time annuities at exorbitant rates of interest. In course of time, when the English people became more inclined to speculation, lotteries became a profitable means of raising money, though they had such disastrous effects on public morality that they were ultimately discontinued. In the year 1693 loans were raised on the security of stamp duties, now introduced for the first time, and on the tonnage of ships. The charter of the Bank of England was granted at the same time in exchange for a loan of £1,200,000, the security of the loan being generally the assignment of one half the additional excise duties. These duties were now imposed without any limit of time. Hitherto indirect taxes had been granted for fixed periods. The negotiations which led to the foundation of the Bank of England contemplated a permanent debt and a permanent fund from which the interest of the debt was to be paid.

The relations of the Bank of England to the finance of the country are as important as the effects which it had upon trade,—in the early part of its career were far more important, for the private bankers were already fulfilling many of the functions of commercial banking. But the Bank of England was from the first the banker of the Government, managing its revenue,—for which it received on its foundation £4000 a year,—anticipating its revenues, putting its securities into circulation, and assisting its credit at emergencies. It was, in point of fact, from the beginning a great department of state, and so obvious and, to the public opinion of the time, so dangerous were its powers, that provision was taken in the Act by which it was constituted, that if it advanced to the Government any moneys on the credit of the public revenue without the authority of parliament, it should forfeit treble the sum which it had so advanced. Moreover, the Bank of England, by virtue of its financial power, became a great political institution, existing by and for the principles of the Revolution; and to it much more than to the public debt may be applied the statement of Bolingbroke that, while the taxes necessary for the expenditure of the eight years' war might have been met by taxation within the year, the Government of the Revolution preferred to incur debt, because the holders of the public securities were thereby interested in the maintenance of the new settlement.

A singular tax was imposed in the year 1694, that on marriages, births, and burials, on bachelors and widowers. These taxes were graduated, rising from four shillings on the burial of the humblest person to £50 in the case of a duke or duchess. The duty on births ranged from two shillings to £30, on marriages from two and sixpence to £50, on bachelors and widowers from a shilling a year to £12, 10s. In the same year taxes were imposed on glass, stone and earthenware, coals and culm. In the next year the currency was reformed, the Government conceiving it expedient that the cost of restoring the clipped and hammered money should be borne by the nation.

During the period in which the old money was being called in, and the new coinage struck and issued, the country was in the direst distress. But the fertile genius of Montagu, now chancellor of the exchequer, invented exchequer bills. Long ago, exchequer tallies, *i. e.*, certificates of indebtedness on the part of the exchequer, had been in circulation, or at any rate been negotiated. But the first exchequer bills—these did not bear interest—were virtually a Government paper based on the security of the revenue, and intended to be a temporary substitute for the currency, now deficient, but in course of restoration and extension. They came at a critical time, and supplied an urgent want. Thus they were an immediate success. They helped to sustain mercantile credit, they lightened the burden of pressing charges on the revenue, they supplemented the weakness of the currency, and they thenceforward formed part of the machinery of English finance. The second issue of exchequer bills bore interest at 5d. per cent. per diem, *i.e.*, a little over 7½ per cent. per annum. These instruments of credit were put into circulation in amounts from £5 upwards. Exchequer bills survived a risk which has been fatal to similar instruments, for in 1698 it was discovered that an extensive forgery of them had been perpetrated, for which some few persons were punished, though the greater criminals escaped. In 1696 the malt tax was first imposed. During the reign of William the whole amount of receipts for revenue was a little over 72 millions, *i. e.*, rather more than 5½ millions annually. Of this amount, about 34½ millions were obtained by indirect taxation, about 21¾ millions by direct taxation, 2½ millions from the post office and the hearth money, and nearly 13½ millions remained as debt. The expenditure was about 45 millions on the public service, nearly 9 millions on the civil list, and rather more than 18 millions on various objects, including repayment of debt.

In forty years, then, the English financiers had found out how elastic and fertile indirect taxation is. We shall see in the course of a century and a half how they used their discovery, and improved on it. Hitherto most of the indirect taxes had been imposed temporarily; the policy on which the country was about to enter necessitated their perpetual imposition. Thus, for example, the malt tax, having been a temporary tax in the eight years' war, was revived and made a permanent tax at the beginning of the war of the Spanish succession. The principal sources, however, of the extraordinary revenue needed for this war were customs and excise, land taxes, stamps, and similar duties, and loans. The amount of debt contracted during the period was a little in excess over that obtained by the land tax, the land tax being less than two-thirds of that obtained by indirect taxation. The form in which the loans were raised was annuities on lives or on terms of years, granted on disadvantageous conditions, lotteries, and the funding of floating debt. The latter operation was in part undertaken by the Bank of England, which thus considerably enlarged its capital. The rate of interest was about 6 per cent., and it appears that the form in which the loans were contracted was the best method after all in which the Government could borrow.

A still larger operation was attempted by Harley in 1710. A new company was formed, which was to take the unfunded debt, amounting to more than 19 millions, to receive 6 per cent. on the sum, with £8000 a year for expenses of management, and in consideration of having performed this financial operation for the Government, was to be invested with the sole privilege of trading to the South Seas. This was the origin of that famous company which ten years afterwards obtained so scandalous a notoriety. In 1715 the aggregate fund was established. Numerous taxes had been made perpetual, and the Act creating this fund directed that the proceeds of these taxes, with the surplus of other revenues, and all other public money, should be brought into the exchequer as a collective quantity. But by this time the whole revenue of the country, with the exception of the annual land and malt taxes, had been pledged to the various loans contracted during the two wars which followed on the Revolution. An attempt was made to lighten the burden of the debt in another direction of finance, *i.e.* by diminishing the rate of interest.

Shortly after the peace of Utrecht the rate of interest began to fall, and continued to decline till it became possible to make use of the fact for the purpose of effecting a considerable reduction in the annual charge of the debt. An attempt was therefore made in 1717 to obtain a small loan at 4 per cent. The project was premature as yet; only a trifling sum was subscribed, and at last it became necessary to raise the rate to 5 per cent. But in order to consolidate parliamentary credit, the Government of the day created three new funds in addition to the aggregate fund of 1715. These are called the South Sea fund, the general fund, and the sinking fund. The aggregate fund was the guarantee under which the Bank of England consented to accept 5 instead of 6 per cent. on their capital, and to circulate exchequer bills at a very low rate of interest. The South Sea fund was the security afforded by the perpetual duties appropriated to the South Sea Company at the foundation of that corporation, the interest in this case being reduced also from 6 to 5 per cent. In order to pay off such public creditors as were unwilling to submit to the reduction, the two companies agreed to advance 4½ millions at 5 per cent., and certain taxes granted heretofore for terms of years were now made perpetual, under the name of the general fund. By these financial operations a saving of more than £300,000 a year was effected. The sinking fund consisted of the surpluses derived from the several other funds, which were to be employed for the extinction of debt, and for no other purpose whatever. The policy of these arrangements, particularly the latter, was soon approved by a considerable rise in the value of stocks. Thus, for example, South Sea stock, which was worth 100¾ at Ladyday, rose by Michaelmas to 111½. In the same year, too, the first vote of credit was taken, in expectation of a threatened invasion by Charles XII. of Sweden. The vote was indeed strongly resisted, and as the majority by which it passed was very slender, Townsend, Walpole, Methuen, and Pulteney were put out of office or resigned. In 1719, the surplus of the three funds referred to above, amounting to over £400,000, was applied to the reduction of debt.

In 1720, the celebrated South Sea scheme was projected. It gives some color to the opinion of those who hold that commercial and financial follies are epidemic, that a scheme far more disastrous in its effects than the South Sea bubble was put into shape the year before in France, when Law floated the Mississippi Company. In the month of November, 1719, the nominal value of the stock of the French company was 18,000 millions sterling, a sum which the statists of the age reckoned at 180 times more than all the currencies of Europe put together. Both projects were trading companies, and in both companies the grant of trade privileges was made the occasion for negotiating terms with the public creditor through the agency of the company. The immediate object of the negotiations entered into with the South Sea Company was the reduction of what were called the irredeemable annuities, created for long terms of years during the wars of William III. and Anne. It is probable that the proposals of the company would have been, to judge from the success with which the conversion of the various stocks in 1710, was effected, financially satisfactory. But unluckily the other great financial corporation, the Bank of England, bid against the South Sea Company, and in this rivalry the latter offered terms, which were finally accepted, under which the company contemplated the purchase of the whole national debt, to be represented by a total capital of 43½ millions, for which they were to receive interest at 5 per cent. The magnitude of the operation, the difficulty sure to arise when attempts were made to obtain *bona fide* subscriptions for the large amount which would be required in order to complete the bargain, and the reaction certain to ensue as soon as ever a check was given to the operation, were lost sight of. It was not perhaps so remarkable, when it is mentioned that the very manner of the negotiation between the company and the Government pushed up the price of the original stock much beyond its natural value, a rise which the directors of the company were not slow to take advantage of, and that the stocks of other companies which could offer no exceptional prospects of profit were raised to nearly as absurd a price as that of the South Sea. The directors of the company took advantage of the fictitious price which the stock had reached, and created shares at or near the market value of their stock. As the fever of speculation reached its height, the directors exalted the price of their shares, and it seems even contemplated an issue of stock at the price of ten times its nominal amount. By midsummer the advanced prices of all public stocks are said to have reached a market value of 500 millions. Before the books of the company closed on June 22, the directors had negotiated for all the irredeemable debts of the Government. On August 12th they dealt with the redeemable debts, amounting to nearly 14½ millions, at the price of 800. When parliament met in December, the price of South Sea stocks had fallen to 200. In the interval, however, the directors declared a dividend of 30 per cent. at Christmas, and pledged themselves to a dividend of 50 per cent. for the next twelve years. This might perhaps have been possible had the subscribers made good their payments, had the directors been able to place all their stock at the nominal prices, and if all their loans were repaid. But the payment would only have been temporary, and both principal and finally interest would have speedily been lost to the shareholders.

The issue to the nation was that the South Sea stock was fixed at nearly 34 millions; that this was divided into moieties, one-half to be the trading stock of the company, the other to be a fund stock on which dividends should be paid; and that the rate of interest payable by the Government on the whole should be 5 per cent, till June 2, 1727, when it should be reduced to 4 per cent. The nation suffered considerable temporary loss, for the capital of the debt, instead of being reduced, was increased by three millions, and the temporary annuities were converted into a perpetual stock. But, on the other hand, the state secured a reduction of interest within six years, and could, if the state of the money market proved favorable, reduce their rate of interest at an earlier date, or if the revenue exceeded the expenditure, could bring the machinery of the sinking-fund into operation. In 1727 three-fifths of the public debt was South Sea stock. In 1724 the rate of interest had fallen so much that the bank, on a revision of its bargain with the Government, agreed to accept 4 per cent. instead of 5 on its new stock, the old rate of 6 per cent. remaining on its original stock.

In 1726 it was found possible to borrow at 3 per cent., and a small stock was raised at this rate. In 1727 the land tax, which had been at two shillings for five years, was raised to four. Those customs and excise duties which had now been made permanent, and were reckoned on an average at 30 per cent. of the value of duty-paying and excisable articles, now yielded, with the malt tax, about four and a half millions, or twice as much as the land tax at four shillings in the pound. In 1732–3 the land tax was reduced to a shilling in the pound in order to conciliate the landed interest, the salt taxes were reimposed, and the deficiencies of the revenue were made up from the receipts of the sinking fund, which now amounted to more than a million annually, and by which reductions were made from time to time in the public debt to the amount of more than six millions in the twelve years between 1727 and 1739. As Walpole had been designated the father of the sinking fund, his policy was severely, perhaps sincerely, criticised by the opposition. But while it was certain that the ministers could count on a great majority for the financial scheme which he proposed, it was not equally certain that he could reckon on support except by reducing the land tax, an impost which was sensibly felt by the landowners, and was correspondingly distasteful. The land tax remained at two shillings in the pound from 1733 to 1739. In other words, direct taxation remained odious, and indirect taxation became familiar.

In 1737 the rate of interest on public securities was less than 3 per cent., for the 3 per cent. stocks were worth 107 in June. This is at about the middle of that remarkable series of years in which the prices of grain were singularly low, a set of facts which is characteristic also of the first half of the 15th century. The cheapness was undoubtedly due in great measure to a succession of abundant harvests, and to the rapid growth of agricultural skill. But it is also to be ascribed in some degree to the increasing dearness of the precious metals, especially silver, and it is likely, for economical reasons which would not be in place to allege here, that a period in which the precious metals are dear will be accompanied by persistently low rates of interest. It is manifest that at the present time, gold is rapidly increasing in value, and that a low rate of interest has accompanied this fact, as it will in all likelihood continue. The House of Commons resolved, in view of the high prices to which public securities had risen, that the rate of interest on all Government stocks which were redeemable should be reduced to 3 per cent. A bill was brought forward embodying this resolution, and was read twice, but lost in the course of the session. It appears that the plan was frustrated in deference to the moneyed interest. That it caused some alarm to the holders of redeemable stocks is proved by the fact that, when the three per cents. stood at £105, 3s. 8d., the four per cents. were at £113 only.

There is one incident in the history of Walpole's financial projects which must be referred to. In 1733 this minister brought forward his famous excise scheme. The payment of customs duties by the importers was obligatory on the landing of such articles as were liable to the tax, or the importer, if he desired delay, was compelled to enter into a bond with sufficient securities for the payment of the impost. The inconveniences of the system were obvious. If the importer were in narrow circumstances, he was frequently obliged to realize the value of his goods by immediate sales, when the market price was low already, and was thus deprived of one advantage which is characteristic of capital, that it enables the possessor of it to wait for favorable markets. It inflicted the maximum loss on the consumer, to whom the tax was of course transferred, and a minimum advantage to the Government; for of course the trader's profit was derived from capital advanced for payment of duty, estimated by the time intervening between the importation and the sale. It tended towards limiting competition in foreign products, for the wealthier merchants had nearly a monopoly of sale in articles on which considerable customs duties were charged, owing to the necessity of finding the tax at once. A further assistance was given to such merchants by the rule under which the importer who paid his tax promptly was allowed a bonus of 10 per cent. on the amount of the tax. It opened the way for frauds on the revenue, for it encouraged smuggling, and assisted the dishonest exporter of foreign produce in obtaining a fraudulent drawback. It checked the carrying trade, narrowed consumption, and impaired the revenue.

The reform which Walpole contemplated was to extend to foreign products imported into Great Britain that system which was already practised with such articles as were liable to the internal duties of excise, *i. e.*, to permit the storage of foreign goods in bonded warehouses on the payment of a trifling landing duty. Thus, tobacco—the experiment was to be tried with tobacco and wine at first—was liable to 6⅓d. per pound. Walpole proposed to reduce the tax to 4¾d., to levy ¾d. on importation and deposit in the warehouse, the import duty being payable as part of the hereditary excise, but being repaid on exportation, and to delay the payment of the 4d. till such time as the owner of the goods might wish to dispose of it to the dealer for home consumption. In this way Walpole contemplated that a great ease would be afforded to the fair trader, and that frauds on the revenue—an invariable source of loss to the honest merchant—would be obviated. It is clear that Walpole anticipated that the revenue would gain all from the check to smuggling and factitious drawbacks which it lost in reducing the duty.

It was unfortunate for Walpole's project that he brought it forward at a time when he had, in deference to the clamor of the landed interest, reduced the land tax to a shilling in the pound, and suspended the operation of the sinking fund. It is true that the plan was not wrecked on these issues, though they must have been present to the minds of many among those who resisted it. It was in vain that Walpole most accurately predicted, as the result of his reform, "that it would make London a free port, and by consequence the market of the world." The great merchants, who had a monopoly of importation; the smugglers, who, in that age of corruption, found means to make themselves a parliamentary power; the public, which loathed the excise as an inquisitorial system, begun in the old days of Cromwell's military usurpation, continued in order to sustain the foreign policy which the Government of the Revolution had prosecuted, and extended in order to enrich foreign favorites and to bribe the servants of the state; and the patriots, as the opposition called themselves, eager to use every chance against Walpole, even when he was in the right, because they had so pertinaciously asserted that he was always in the wrong,—united to defeat the project. Walpole's life was threatened in the streets, and, what he feared more, his majority was imperilled in the House. The warehousing scheme was abandoned, and not revived till 1803. The elder Pitt, when, being in the ascendant, he could afford to criticise his own conduct, said that he regretted nothing so much as his opposition to Walpole's excise. It is singular that the principal works on commerce and finance which were published before the adoption of the bonded warehouses system pass over Walpole's plan in silence.

The public debt was increased between 1739 and 1748, the date of the peace of Aix-la-Chapelle, by about 28 millions, the interest on this sum being principally provided by duties on spirits, though during the whole period the land tax was put at 4s. In 1750 it was reduced to 3s. But the old customs and excises were continued and increased. In 1731 a duty of 20s. a gallon had been imposed on gin, with a view to checking its use. It is well known that this prohibitory duty led to extensive smuggling, and to illicit distillation on a large scale. Hence, in 1743, when the Government was on the look-out for means, it was proposed to repeal the Act of 1731, and impose remunerative duties in the place of the prohibitive tax. The proposal was resisted on grounds of health and morals, but was carried.

Early in 1750 the plan suggested in Walpole's time of reducing the rate of interest on public securities, with the option of receiving the principal, was revived, as the three per cents. had been above par in the autumn of 1746. The amount to be treated in this way was nearly 58 millions. The holders of the stock were offered 4 per cent. for 1750, 3½ till the end of 1757, and 3 afterwards. In the course of the year the terms were, except for about 3¼ millions, agreed to. In the next year the consolidated stock was first formed by merging nine separate loans into a common 3 per cent. fund, and subsequently other stocks were consolidated in the same manner. The project was not only highly successful, but the new three per cents. rose in June of the same year to 106½. In 1753–4 the land tax was reduced to 2s. In 1755, when the Seven Years' War was imminent, the land tax was raised to 4s., at which sum it continued, except in 1767, 1768, 1769, 1770, 1772, 1773, 1774, 1775, till 1798, when, being made perpetual, the ceremony of its being granted annually was abandoned. During the Seven Years' War and onwards, it became the practice of English financiers to invite loans upon one of three principles. They either offered such a variable sum of three per cent. annuities as represented the difference between the value of this security and the same amount actually lent, as, for example, £120 stock for £100 borrowed; or a fixed amount of stock for a variable percentage, as £100 stock for (say) £80 lent; or gave £100 stock, and a variable sum in long or life annuities, as (say) £100 stock and 22s. 6d. per cent. per £100 subscribed for ninety-nine years. The loans raised during the Seven Years' War were far in excess of any that had been negotiated before. That, for instance, of 1760 was twelve millions, and the same sum was raised in the next year. When the peace of Paris was signed in February, 1763, the nominal capital of the English funded debt was in amount nearly double that which had been incurred up to the treaty of Aix-la-Chapelle.

The loser in the Seven Years' War was France. It was prostrated, was stripped of its colonies, and wholly impoverished. No war in the world's history had such important results on the remote future as this has had. From this time France ceased to be a colonizing nation, and England occupied its place, as well as extended the settlements which it had already founded. At the beginning of the Seven Years' War, France was the determined rival of England in the East, and had occupied the south and north of the English plantations in the West. At the conclusion of the Seven Years' War, it had lost both its colonial centres. By this loss it was also deprived of one among those outlets for discontent which have been so serviceable to the Governments of Western Europe. Emigration does not relieve a country of its population so much as it does of its dissatisfied and disaffected members. The destruction of French colonial enterprise had no little indirect effect on the passions of the Revolution. The supremacy of England in the northern part of the New World led the Protestant inhabitants of Ireland, bowed down and impoverished by the oppressive revenue laws of England, to emigrate westwards, and so give at home an opportunity for the Irish Catholics to reassert themselves, and for the Americans to strengthen or recruit themselves in the War of Independence. Again, the charges of the Seven Years' War were so great that the British parliament tried to help itself by taxing the colonies; the colonies met this project, after various acts of resistance, by the Declaration of Independence; the war of American independence found an ally in France, which was eager to blot out the memories of the Seven Years' War; the reaction of republican America on monarchical France aided those theories which developed the French Revolution. On the Revolution followed the Empire; the Empire induced the reaction of the Holy Alliance; from this came the western rising of 1830, the general rising of 1848, and ultimately the doctrine of modern European politics, that, namely, of the nationalities.

We are concerned, however, with the financial consequences of the Seven Years' War. It was in no slight degree provoked by the hostility of the French and English settlers in America, and it had been carried on at an enormous expense. The result was to secure the ascendency of the English race on the American continent. It appeared to deserve the gratitude and the sacrifices of the colonists. There is little doubt that the inhabitants of the plantations would have recognized these facts, and have responded according to their means to an appeal made to them by the ministry. In an evil hour the ministry attempted to impose taxes on them by the authority of the English parliament. No one, not even the colonists themselves, doubted that the English parliament could enact laws for the colonies, could regulate their trade, could dictate the course of their industry, and thus as effectually bring them within the financial arrangements of the British empire as though it collected a revenue from them. In fact the colonial system was really a department of finance, though its details were defended on those mercantile principles which Adam Smith expounded and refuted. The imposition of the Stamp Act was resented on political principles, and was resented successfully. Passed in 1765, it was repealed in 1766, though at the same time the House of Commons passed an Act asserting, in the broadest manner, the right of the English parliament to tax its dependencies. The Americans answered by refusing to consume British goods. As is well known, the ultimate cause of the revolt of the colonies was the despatch of the East India Company's tea ships to Boston, the tax on tea imposed on the colonists being nominally retained in order to serve the interests of the company, whose finances were seriously affected at the time, but really in order to affirm the right, on which king, ministry, and parliament insisted, of taxing the colonies through the machinery of the English House of Commons.

From the outbreak of the War of American Independence the land tax was annually granted at 4s. in the pound, though of course on the old assessment. It formed the basis on which an annual issue of two millions in exchequer bills was made. But the residue of the means from which the interest on the annual increment of debt was payable was derived from taxes on consumption and stamps, *i.e.*, from indirect sources. The actual debt created during the American war was nearly 97½ millions. The sum received from loans was 75½ millions, and the annual sum needed for the interest on this debt was a little over 4 millions. In 1786 Pitt, after inviting the attention of parliament to the magnitude of the debt, and the necessity for reducing it, proposed to revive and make permanent the machinery of a sinking fund. The minister had taken counsel with Dr. Price, who for some years previously had been lamenting the downfall of Walpole's sinking fund, and urging that by borrowing at simple interest great accumulations might be formed at compound interest, and that thereby the debt would be ultimately extinguished. Pitt's proposal was that the exchequer should pay a million annually in quarterly instalments to six eminent persons, who should invest the sum in the purchase of stock, and that this payment should have precedence over any other issues of the exchequer, except the interest on the debt. He intended that the interest on this fund should accumulate with the annual receipts, and he calculated that in twenty-eight years the fund, with accumulated interest, would yield an annual surplus of four millions. When this sum was reached, the interest was to be at the disposal of parliament.

An amendment was proposed on Pitt's proposal by Fox, to the effect that when at any future time a loan was proposed, say of six millions, the commissioners, if they had sufficient funds at their disposal, might purchase a sixth of the stock. It was accepted by Pitt, and formed the process by which, during the great Continental war, the commissioners of the sinking fund continued to lend their balances and the annual sum which they received from the Government to the State, thus piling up an imaginary obligation of the nation to itself, which seemed to extinguish public debt, but which would certainly be treated as a fiction, as indeed came to be the case, when the great war was over. The efficiency of the sinking fund consisted entirely in the extent to which, by requiring an income which should be in excess of expenditure, it necessarily diminished debt. Its delusiveness arose from the fact that the actual funds which it had accumulated were actually invaded under the pressure of war-taxation and expenditure, and that its nominal continuance was accompanied by the creation of a fictitious loan, the process of which was burdened by the expenses of an office. Other schemes were adopted subsequently, more or less similar to the old sinking funds, in later times, to which we shall allude presently.

For a short time before 1793, when England began her longest and costliest war, the English funds rose greatly in value, chiefly, it is said, because they were conceived to be the safest investment which could be found for those who were flying from the Continent in dread of actual or prospective violence. But immediately on the outbreak of hostilities with France the country was put to the severest straits. In the year 1793 a serious commercial panic occurred, accompanied with an unparalleled number of bankruptcies. Loans of enormous amounts were raised as the war went on; the current expenses of Government were met by credits on the bank; and at last, on February 27, 1797, the Privy Council ordered the Bank of England to suspend cash payments. For twenty-three years afterwards the suspension was continued.

Up to 1796 the additional burdens which were imposed to meet the interest on loans and to defray some of the annual charges of the war were raised almost entirely from indirect taxation on consumption, sometimes on production, but not on property. But in this year Pitt proposed to levy duties on the succession to real and personal estate. Knowing that his budget would meet with hostile criticism, he determined to divide his bill, and impose the projected tax on real and personal estate by separate enactments. The tax on personalty was accepted with very little remonstrance, though a few solid objections were urged against the measure. But the country party strongly resented the proposed tax on real estate. They absented themselves from the House, and nearly left Pitt in a minority. The minister felt that he must give way to them, and postponed his bill for granting duties on realty in succession for three months, thus virtually abandoning the project. The discrepancy, therefore, between the liabilities of real and personal estate, when they become the subject of devise or succession, has never been remedied. It is true that an attempt was made by Lord Lauderdale to suspend the operation of the Act which had been passed, till such time as the anomaly might be rectified. But he was ruled to be out of order, on the ground that no bill after it has been passed can be repealed or modified in the same session. Like many similar Acts, the legacy duty was tentative, and the rates of tax were progressively raised according to the proximity of blood in which the legatee or heir stood to the testator or ancestor. In order to compel the making of wills, and to obviate the risk that persons might avoid a testamentary disposition with a view to escape the legacy duties, exceptional probate duty was imposed on those estates which were administered without a will.

Apart from the manifest inequality of a tax which omitted to charge succession duty upon real estate, especially at a time in which the value of such estate was rapidly rising, objections were alleged against the tax on the ground that it was likely to inflict inconvenience or injury in the case of persons engaged in trade by the compulsory exposure of their circumstances, and because it was sure to breed discontent. More subtle was the objection taken by Lord Lauderdale, and afterwards by Mr. Ricardo, on the ground that it was a tax on capital, and therefore injurious to the development of wealth. The answer to this objection is, however, simple. It is impossible for a Government to tax that which cannot be saved, but must be consumed in order that industry may be continuous. Now that which may be saved is either consumed in superfluities, and therefore may be made the subject of direct or indirect taxation, as the case may be, or is saved and employed as capital, or accumulated as reserve. In other words, not only is it not true that capital should not be taxed, but it is true that nothing but that which is or may be capital can be taxed.

More valid than this objection to legacy duties is that which can be alleged from the fact that, under existing circumstances, it is easy for the wealthy to evade the tax by a *donatio inter vivos*. The attempt to evade duties or liabilities on successions is a very old practice in England. One of the earliest, after the Great Charter perhaps the earliest, written law in English history, the Statute of Marlebridge, is intended to defeat attempts to evade feudal dues by such donations. There can be no doubt that similar practices prevail at present. Nor can they be prevented until voluntary gifts and transfers are registered, published, and rendered traceable at last to the officers of the revenue, who might have powers to visit with penalties in addition to ordinary duties all conveyances and transfers made at such a date previous to the death of the donor as would indicate that the gift could reasonably be interpreted to imply an intention of evading legacy duty. But at the same time it cannot be stated too often that, first, it is not always the best system of taxation which must be adopted, but the best possible system, since communities require to be habituated to a new tax; and, next, that any unfairness in the imposition of taxation is sure to suggest evasion. A financier must be just, if he wishes the taxpayer to be honest. There are three offences against the revenue, looked on as very differently culpable, but all stimulated by financial error or injustice. The first is that just alluded to, a gift of property during the life of the donor with a view to evade the legacy duties. This fraud is thought scarcely culpable, though it will be obvious that it is much more easy for the wealthy to practise it than for those who are in narrow or moderate circumstances. The second is the evasion of the charges imposed on earnings by the so-called property tax, but which is of course no property tax at all, since large masses of property are exempted from its operation, and incomes which are in no sense property are taxed at the same rate as those which issue from property. The third, now considered as merely vulgar larceny, is smuggling. A generation ago public sympathy was strongly with the smuggler. The change in this opinion is intelligible and instructive. The greater part of English taxation of an indirect kind was imposed for political purposes, or to serve private interests, up to the time when Sir Robert Peel, nearly forty years ago, began seriously to reform the tariff. In course of time, he and those who succeeded to his policy have adopted and carried out the principles that protection must be abandoned, that finance must not be manipulated in order to suit political antipathies, and that taxation must be imposed for revenue purposes only. The progress of these principles has extinguished the trade of the smuggler. For a long time even economists argued that the smuggler was the practical critic of a vicious system of finance. It may be predicted with some confidence that, when a just property tax is imposed instead of an unfair income tax, public opinion will enforce a morality which it does not require at present, and will assist the Government in enforcing that morality by penalties and by compulsory publicity; and that similarly when real estate is made liable to the same duties as are imposed on personalty, the disposition to evade the duties will be checked, and that machinery of Government which detects and chastises fraud will be strengthened and enforced.

The disasters which followed on the outbreak of the great Continental war, the enormous cost at which the war was carried on, and the demand for money in order to meet current charges, produced serious effects on the currency. A considerable exaltation took place in the value of gold, and as gold had become the chief currency of England, its exportation was under the circumstances inevitable. In 1794 the Bank of England possessed in cash and bullion over 8 millions. In February, 1797, the stock of treasure had sunk to 1½ millions. The Government had overdrawn its account with the Bank on February 25, 1797, to the amount of nearly 10 millions, and was demanding further advances. It is true that no real alarm was felt for the ultimate solvency of the Bank, but considerable and just alarm was entertained as to the convertibility of the notes. Hence the Government, on February 27, 1797, ordered the Bank of England to suspend cash payments, and shortly afterwards authorized the issue of notes below five pounds.

In November, 1797, Mr. Pitt introduced what he called a new and solid system of finance. The scheme was afterwards explained to consist in a triple assessment, *i. e.*, a trebling of all the assessed taxes imposed on individuals, with a limitation, however, that such a tax should not exceed the tenth of the taxpayer's income. It was estimated that this tax would yield 7 millions, but the result was disappointing. From the first it was exceedingly unpopular. It was felt to be unequal, and to press with peculiar severity on those whose avocations constrained them to contribute to those assessments which the Government imposed, and perhaps necessarily, without much consideration for those who had to pay them. At the same time the poor escaped the tax, for according to Pitt's budget speech, the assessed taxes were leviable on between 700,000 and 800,000 householders, and yielded £2,700,000, though the contributions of 400,000 of these householders did not amount to more than £150,000.

The triple assessment lasted only a year. It was probably intended only to be preparatory for the income tax, which was imposed in 1798. Indeed, if the expenditure of the war was to be met by any other resource than loans, it was necessary to discover some tax which should reach all classes who could be made to contribute to the necessities of the exchequer. Now it was plain that, had the assessed taxes been ever so productive,—the amount actually received from them was only two-thirds of their estimated yield,—they are more or less optional in character, and could therefore be evaded. The income tax, according to Lord Stanhope, had often been urged on Pitt, and especially by Bishop Watson. It began as a graduated percentage. If the income of the taxpayer was between £60 and £65 a year—it was not imposed on those rated below that sum

—the tax was to be a 120th part of the income, and the proportion gradually rose to a 10 per cent. tax on incomes of £200 and upwards. Pitt estimated the produce of the tax at 10 millions; it actually yielded only 7. It was imposed as a war tax, to cease at a declaration of peace. But Pitt immediately pledged it to a loan, and in 1801 3 millions of its annual produce was thus appropriated to irredeemable debt. The remission of the tax then rendered it necessary that new taxes should be imposed, and such was the course actually adopted after the short-lived peace of Amiens.

The income tax was criticised by Lord Holland on grounds very familiar to us in the later times, namely, that it visited incomes "derived from permanent and disposable capital, those arising from precarious and temporary possessions, and those from labor, talents, and industry at the same rate, and was therefore unjust, unequal, and impolitic." It was also argued that the term property tax was a misnomer,—that property was often not visited by the tax at all, and that what was not property was mulcted. It was alleged that to require the disclosure of one's circumstances was contrary to the prejudices and customs of Englishmen, was unconstitutional, and a serious injury to commerce and trade, since merchants, it was alleged, would often find it convenient to sacrifice more than a tenth of their income rather than permit the publication of their affairs, and, lastly, that it was a violation of public faith with the stockholder, whose dividends were mulcted, by the intervention of that very Government which was pledged to pay him an irredeemable annuity, of one tenth of his just due. But no objection seems to have been alleged, on the one hand, against the graduated character of the tax, nor, on the other, against the low limit on which the full amount was exacted.

At the remission of the income tax imposts to the amount of 38½ millions a year were paid, this sum being double the amount raised in 1793. With the exception of the perpetual land tax, a little over 2 millions, and every year becoming more disproportionate to the rising value of land, almost the whole of this amount was raised on consumption, *i. e.*, from indirect sources. Rents rose rapidly, under the joint operation of high prices and deficient crops. Profits increased, owing partly to the legitimate growth of manufacturing industry,—for the inventions of Hargreaves, Arkwright, and Watt were beginning to produce their effects,—partly to the enormous expenditure of Government, and to the subsidies and loans which were lavished on the Continental powers and expended in the purchase of British manufactures. But the condition of the working classes became deplorable. Mr. Porter has proved with minute exactness that the real burden of the long and exhausting Continental war was, as far as England is concerned, mainly sustained by labor.

In 1803 the income tax, under the name of a property tax, was reimposed. The sources of income were distinguished and put into five schedules named A, B, C, D, E,—being respectively lands, tenements, mines, etc.; occupancies or tenancies; shares, annuities, and dividends; profits and gains in professions and callings; and public offices of profit and pensions. On all but the second a tax of a shilling in the pound was levied, but on the second ninepence only in England and sixpence in Scotland. Incomes below £60 a year were exempt from the tax, and, following the analogy in some degree of the first income tax, a reduction of the rate was made in incomes increasing by £10 a year up to £150, beginning at threepence in the pound tax up to elevenpence, the largest remission being made on the largest income. But it will be observed that, as in the first income tax, the quantity payable increased with the income, so in this system the deduction increased with the receipts of the taxpayer, though it ceased at a low amount of income. Furthermore, some consideration was shown to those who had families. Those householders who had more than two children were allowed, on incomes between £60 and £400, a reduction in the rate of 4 per cent. for each child; those between £400 and £1000, 3 per cent.; those between £1000 and £5000, 2 per cent.; those who had £5000 and upwards, 1 per cent. for each child.

In 1805, 25 per cent. was added to the income tax, and in 1807 it was raised to two shillings in the pound on incomes in schedules A, C, D, and E, and to eighteenpence in England and a shilling in Scotland on the annual rental of tenancies under schedule B. The limit of exception was lowered to £50, and an abatement of a shilling in the pound was allowed on all incomes between £50 and £150 a year. Laborers and artisans whose earnings were less than thirty shillings a week were exempted from the tax, but it does not appear that the deductions in the case of children were allowed, as in the Act of 1803. The war income tax was levied up to April 5, 1816, when it expired, and despite the efforts of Castlereagh and others who urged its continuance, parliament refused to sanction the impost any longer.

The rejection of the income tax as a means of revenue in 1816 necessitated, at the winding up of the costly Continental war, the imposition of indirect taxes upon most processes of production and all of consumption, for the corn laws and customs duties on foreign imports of food exalted indirectly the value of home produce. Industry was checked at its source. Food, the raw material of labor, was rendered scarce, while the farmer, who conceived that the maintenance of the corn laws was his only hope of profit, and the sole power by which he could pay his rent, was mocked by violent fluctuations of prices, and was equally ruined by plenty and by scarcity.

The first hint given that the progress of the nation was impossible until its fiscal system was revised, was the formation and presentation of the Merchants' Petition. This remarkable document was drawn up by Mr. Tooke, who has narrated, in the last volume of his *History of Prices*, the circumstances under which it was composed, signed, and presented to the House of Commons. It was not presented in the House of Lords, for Tooke had resolved on committing the document to the hands of Lord Lansdowne. But those who had signed the petition objected to this nobleman, on the ground of his Whig principles, and the framer of the petition would not give way. The petition was presented to the House of Commons by Mr. Baring, afterwards Lord Ashburton, and was debated. The Government, that of Lord Liverpool, expressed its agreement in the principles which the petition avowed,—those, in short, of free trade,—and admitted that these principles were not only abstractedly correct, but ought to be adopted at once if one were making a beginning, but declined to agree to the inference that they could be adopted in a country where trade and commerce were and had been for so long a time based on artificial restrictions. The protected interests, however, signified pretty clearly that they would not allow themselves to be molested. But the Government granted a committee of inquiry on foreign trade, and with this committee commences the movement which six-and-twenty years later culminated in the practical adoption of free trade principles and in the abolition of the corn laws. Such a result was only a question of time, when Lord Liverpool could say in May, 1820:—"We have risen to our present greatness under a different system than that of free and unrestricted trade. Some suppose that we have risen in consequence of that system. Others, of whom I am one, believe that we have risen in spite of that system. It is utterly impossible, with our debt and taxation, even if they were but half their amount, that we can suddenly adopt the system of free trade." Lord Liverpool probably knew that, as Swift had said, "in the arithmetic of the custom-house, two and two do not always make four;" but he was not alive to the enormous fertility of that system of finance which, substituting low for high duties, with some exceptions, and invariably avoiding such fiscal changes as hinder the progress of industry, leaves the widest opportunities for production, exchange, and consumption. Lord Liverpool added that though he supported the corn law of 1815 as a measure of justice to the agricultural interest, he was of opinion that had the bill not passed at that time, it should not have been passed at all. It may be observed, so much was trade hampered at this time by legislation the primary object of which was to extract a revenue at all costs and hazards, that there were more than 1500 custom-house acts relating to the entry, export, and custody of goods.

The committee of the Commons continued its sittings through three sessions, and presented four reports on the subject of foreign trade, accompanied by abundant evidence. The committee of the Lords sat for two sessions, and presented two reports. The necessity for admitting the principles of free trade was felt and expressed by the committee; but so much alarm was excited among protected interests, even by the recognition of the abstract propriety of free exchange, that the committee felt it necessary to strongly disclaim any sympathy with sudden change, and to calm frightened imaginations by declaring that the greatest prudence and circumspection must precede any project, and accompany any measure of reform. The first thing, however, which people recognized was that great additional taxation did not add but in a very small degree to the income of the exchequer. This was the effect of the financial statement of 1819, which Tooke justly characterizes as the last thoroughly vicious project accepted by the House. In 1823 Mr. Vansittart retired from office, and during the next five years, when Mr. Huskisson was at the Board of Trade, great and notable modifications were made in the customs and excise for taxes amounting in the aggregate to £8,340,000 were remitted, the experiment being attended by a manifest elasticity in the revenue. The enormous aggregate of custom-house statutes was consolidated into eleven, by the labors of Mr. Deacon Hume. Between 1827 and 1841 further reforms, though not on so considerable a scale, were made, the most important of which was the abandonment of the excise on beer in 1830, and that on printed cottons in 1831. It is an apt illustration of the effect induced by such duties as this, that within a very short time the price of cottons fell below the amount (3½d. a yard) which was levied under the old excise. But, on the whole, little was done for a systematic financial reform during the period which elapsed between the death of Mr. Huskisson and the defeat of the Melbourne administration. One change of great importance was made in the adoption of Mr. Rowland Hill's plan of the penny postage. This scheme involved the immediate sacrifice of revenue to the amount of a million and a quarter, but it gave a considerable impetus to trade, and rendered the discussion of those further fiscal reforms which were effected by Sir Robert Peel easy, perhaps possible.

Sir Robert Peel's ministry was formed in September, 1841, and had before it a task of no common magnitude. For five years the average deficiency of the revenue, according to Sir Stafford Northcote's statement, had averaged a million and a half, the year in which Sir Robert Peel took office having been characterized by the largest deficiency. The cause of this was that the revenue had fallen short of the estimates; in other words, the financial system of the country was fundamentally vicious. The reforms which Sir Robert Peel immediately determined to bring about were greatly assisted by the information obtained from Mr. Joseph Hume's report of 1840, which stated "that the tariff contained 1150 different rates of duty chargeable on imported articles, besides others imposed on all unenumerated articles; that there was no principle in the finance of the country, some duties being levied for the sake of revenue, some for that of protection; that serious detriment to the home consumer ensued from the differential duties in favor of the colonies; and that of 862 articles chargeable with duty 147 paid no duty at all, while 17 articles supplied 94 per cent. of the revenue, 29 others 4 per cent. more, so that 816 articles yielded no more than 2 per cent. of the revenue, though the imposition of the customs duties was a serious hindrance to trade and manufactures."

In drawing up his budget of 1842, Peel had three expedients before him. One was to adjust the corn laws, so as to make them press less heavily on the consuming and manufacturing classes; the second, to reform the tariff; the third, to obviate the constant deficit in the revenue. The first was undoubtedly the most pressing. The depression of trade and manufactures in 1842 was so serious, and the remedy in a repeal or great reduction of the taxes on food was so obvious to all rational persons, that the measure was in the highest degree expedient. But Peel could not as yet venture upon it; the mere proposal to levy a foreign fixed duty on corn had more than anything else contributed to the downfall of the Whigs in 1841, and the measure was postponed till it was yielded to famine and agitation by an angry and disappointed faction.

Sir Stafford Northcote, in discussing the fact why the Whigs were the freetraders and the Tories the protectionists in 1842–46, says he sees no particular reason why this phenomenon should have been exhibited, judging from the antecedents of the two historical parties, and he inclines to believe that the Whigs were discredited in the eyes of their opponents by their associations with the Radical party. But the solution of the question is not far to seek. The reforms of Mr. Huskisson applied solely to commerce and manufactures, to colonial interests, and to some local industries. Most of those who represented such interests were alive to the fact that protection was no longer necessary for them, or that it was inexpedient that the consumers of colonial produce should be exceptionally taxed in order to give a subvention to colonial planters and their agents. The majority which supported Peel would have been on the whole indifferent to such financial reforms as simply affected manufactures and foreign trade. As consumers, they were benefited by the cheapening of such produce; as producers themselves, they had wit enough to discern that the general prosperity of the country improved the market of the agriculturist. But when it came to be a question whether the artificial prices which the sliding scale was supposed to bestow on farmers and landowners should be abandoned, they were convinced that their interests were being sacrificed; and though they constantly tried to alarm the public with the bugbear of dependence on foreign supply, they frequently admitted that the struggle on their part was to maintain the existing level of their rents. In the 18th century, especially in its earlier half, the country gentlemen would have had no difficulty in accepting free trade, provided they could escape the land tax, for the produce of the country was on an average in excess of its wants; in the first half of the 19th century, they were firmly convinced that all their interests were bound up in the sliding scale, and it must be admitted that the Ricardian theory of rent, now become popular, gave them certain grave scientific reasons for the belief which they entertained.

The estimates which Sir Robert Peel formed suggested that, if the House would accept his new system of finance, he should be in the possession of a surplus of £1,800,000. The greater part of this sum he proposed to devote to the remission of taxation, the particulars of which may be found in the works of Sir Stafford Northcote, of Mr. Tooke, and Mr. M'Culloch. The estimates, partly from some singular oversights of Sir Robert Peel, partly from the fact that the distress of the country was too serious to be cured by trifling remedies, were a failure, for the receipts of the exchequer, notwithstanding the new taxes which Peel imposed, were two millions less than he anticipated. The process by which the minister sought to put the finances of the country on a sound basis, and to provide a surplus in future years, was the income tax,—an impost which had been decisively rejected in 1816, but was now reimposed for five years at 7d. in the pound. The character of this tax of 1842 varied a little from the old tax of 1803, 1805, and 1808. The limit of exemption was fixed at £150 a year, the old schedules were retained, but the farming classes were specially favored. The rate previously levied on these persons had been three-fourths of the tax imposed on those who are comprised in the other schedules. In 1842 it was made one-half. The income tax was not extended to Ireland, but a higher tax was put on Irish spirits, and on the whole the Irish and English stamp duties were equalized.

The question has been raised, whether, in case the corn laws had been at once repealed, it would have been necessary to impose the income tax. It is probable that the answer should be in the negative. But apart from the difficulties in the way of a measure which would certainly at this time, as it did four years afterwards, have roused the most angry feelings, it may be safely stated that Peel's proper business was to establish a surplus, and to effect this in the surest way possible. He could not have succeeded in imposing a just property tax, for such a tax would have been nearly as unpopular among his supporters as a repeal of the corn laws. He therefore imposed an income tax, and though the scheme was criticised adversely, both in the Commons and the Lords, it was carried by overwhelming majorities in both Houses, the arguments against the tax being summed up with great precision in the protests of Lords Radnor and Western. The income tax has since always figured in the budget, and it cannot be denied that, whatever objections may be alleged against its equity, it secured the end which Peel had before him, and has more than once been of great service in supplying the deficiencies of revenue due to an increased expenditure.

In 1843 and 1844 a few remissions of customs duties were effected. But the effect of the tariff reforms was now visible. The excess of income over expenditure in the first year was 2 millions, in the second 6½ millions. The wheat crop of 1843 was an average, that of 1844 was abundant; the price was low, and the imports of foreign corn nearly ceased. In consequence, Peel was enabled to bring forward his most considerable measure of tariff reform. He remitted no less than 3½ millions in the customs, and more than a million in the excise. The effect was an increase of income over expenditure of nearly 2½ millions. In 1846 the remission was three-quarters of a million, but there was again a surplus of 2¾ millions. In the same year the repeal of the corn laws was effected, and a modification was made in the sugar duties, followed in 1848 by an equalization of these duties. A little later and the Navigation Acts were repealed; and, finally, the last fragment of protection was extinguished in the abolition of the differential duties on foreign timber. The detailed history of these changes is best given in the last three volumes of Mr. Tooke's *History of Prices*, and in the annual summaries of the *Economist* newspaper, compiled by Mr. Newmarch, who was the coadjutor of Mr. Tooke in the last three volumes of the history referred to. The process by which the new system of finance was established is described and illustrated by Sir Stafford Northcote in his *Twenty Years of Financial Policy*.

The principles of modern English finance are—(1) to impose as high a duty as is consistent with the prosperity of the revenue on such articles of voluntary consumption as may be dispensed with and may be taken in excess;—of these the most notable are alcoholic liquors and tobacco; (2) to abandon taxation on all articles which are used for manufacture or food, the last tax of the latter kind which has been extinguished being that on sugar; (3) to levy the lowest duties possible, consistent with revenue purposes, on articles of voluntary consumption and wholly innocent use, of which the best type is tea;—such are the customs and excise, the only trades now under the control of the inland revenue officers being those of the maltster, the brewer, and the distiller; (4) to attempt the collection of as large a revenue as possible at the lowest possible rates on transactions by the mechanism of stamp duties; (5) to simplify the assessed taxes, some of which indeed, as the house duty, are objectionable, and some of which have been perhaps imprudently remitted; and (6) to make use of the income tax as a supplementary means of raising a revenue when the expenditure is notably in excess of the income. Nothing, indeed, is simpler than the function of the chancellor of the exchequer, if he is resolved not to modify the established sources of the revenue or readjust its parts. All that is needed is to impose an additional income tax, or to remit a portion of that which has been imposed.

It will be seen, however, that the continuity of the present system of British finance depends upon a continuity in the habits of the people. The revenue derived from alcoholic liquors and tobacco amounts annually to about 42 millions. That which is supplied from articles of voluntary consumption, the use of which is wholly innocent, is about 4½ millions, the principal contribution to this head coming from tea. Purely direct taxation—the land, house, and income tax on the one hand (the last-named at 3d. in the pound), and stamps, probate, and legacy duties on the other—yield nearly equal sums, a little short of 8 millions each. The post office, which is *sui generis*, *i.e.*, a payment for a special service rendered, supplies a further gross sum of 7 millions. The security, then, of the English revenue depends on the extent to which the habits of consuming alcoholic liquors and tobacco are permanent. The consumption of the former is threatened by a powerful and apparently growing organization and agitation, and it can hardly be doubted that, should those who demand that the control of the traffic in alcoholic liquors ought to be transferred from the present licensing bodies to a direct popular vote be successful, the dimensions of the trade would be curtailed and the revenue diminished. One cannot otherwise account for the alarm which is felt by those interested in the success of the trade at the activity of their critics, and the process by which the advocates of restraint believe that they can compass their ends. It is possible, also, that in the future the poorer classes, whose consumption is the cause of so large a revenue, may imitate the temperance or moderation of those who are better off, and whose habits are to all appearance in marked contrast to those of their progenitors two or three generations ago. Should such a change ensue, it is not easy to determine what would be the direction taken by the financiers of the future; for though there are some obvious sources of taxation, particularly real estate devised or inherited, and property specially so called, yet the receipts from these sources would necessarily be limited, and there is nothing more difficult, as we have attempted to show, than the task of familiarizing a people with a new impost.

We need not be surprised that such a difficulty is felt and must be encountered when the financier attempts new expedients; for, apart from the natural dissatisfaction with which a new tax is paid, and the resistance which powerful interests may make and have made to such imposts, such as we have seen to have been successful when Pitt attempted to levy an equal charge on the succession to personal and real estate, a tax may make a serious difference to values, or may interfere fatally with an industry. Thus there can be no doubt that the exemptions with which land is favored in the devolution of real estate is a cause why the rate of return to the purchase money of land is so low. Fixed charges will, of course, in the long run make no difference to the rate of interest derived from investments in land, though they would diminish the value to the vendor. Thus the value of land in France is as high or nearly as high as it is in England, and is much higher in Belgium, though in both countries there is a heavy land tax. But freedom from an accidental tax, a tax which cannot be computed beforehand, is a direct advantage to the vendor, and in the case of land would add to the number of years' purchase at which the land is sold.

The taxes which have been laid on industry and consumption, apart from the reckless manner in which they were imposed, were felt far more severely in their first incidence than they were when they became familiar. There is a convenient and suggestive example of the manner in which such taxes affect industry in a matter of recent experience. Apart from the question whether Mr. Lowe's abortive match tax was in itself a judicious impost,—a question which, it may be affirmed, most persons would answer in the negative,—it became plain, when the proposal was made, that two results would follow from its adoption. It would seriously curtail the employment of a very large class of very ill-paid laborers, and thereupon induce great distress on those who were already very poor, and it would ultimately transfer the industry to those countries where no excise is levied on the manufacture. Already, although matches are bulky in proportion to their value, and are conveyed from the place of their origin to the market of consumption at very high rates, owing to the dangerous character of the goods, the competition of a place so distant as Jönköping in Sweden against the English manufacturer is so sharp as to lower materially the profits of the home producer, and to make it necessary that the manufacture should be carried on by low-priced labor. It is almost certain that, had the scheme of taxing matches been adopted, the supply of these articles would have rapidly been limited to foreign producers, or it would have been necessary to have established, simultaneously with the impost, a really protective duty on the foreign article.

Manufactures, indeed, unless they are wholly ruined by taxation, or at least confined to domestic supply, can be and are made to accommodate themselves to circumstances. The amount of capital employed in supplying the taxed commodity diminishes with the demand, competition between capitalists slackens, and in due time the rate of profit in the particular industry reaches its old level. But the process is undoubtedly accompanied by loss to both capitalist and laborer, as well as followed by an enhancement of price to the consumer, together with a still more serious depression of foreign trade, however fully the duties levied are allowed on export. In illustration of the effect which an erroneous system of finance induces on industry, nothing can be more instructive than the history of the revenue in the few years preceding Peel's administration of 1841; the effect of the reform in the tariff which that minister adopted; and the loss which ensued from postponing the full effect of these reforms owing to the hesitation which Peel showed in abolishing the corn laws, which could have been much better repealed in 1843 than in 1846.

It is said, and has been said for the last century, that it is inexpedient to tax capital. To this we have already given the answer, A Government can tax nothing but capital, actual or potential. For all wealth is of two kinds. The first is that which is absolutely necessary for the continuity of industry, and which cannot be taxed without destroying that industry. There can be no tax on necessary consumption. The second is that which can be saved, which is in part saved, in part consumed unproductively.

This product of labor can be and can alone be taxed. The English system of finance attempts to levy taxation on a part of this, either directly on revenue, though it might be levied with advantage on the wealth itself, instead of or concurrently with the revenue derived from the wealth, or indirectly on consumption. Nor does the taxation of capital diminish capital. It merely changes its direction. The tax may be expended unwisely, even mischievously. But it undoubtedly calls labor into activity, and may therefore give wider employment than it would if left in the hands of those who are now mulcted of a portion of what they might have saved or spent. It may even increase capital by increasing economy in expenditure, and inducing those who are taxed to fill up the void in their own resources which the tax has created. The expenditure of the Dutch in the palmy days of their finance was enormous; the taxation to which the people submitted was searching to an extent and minuteness which has had no parallel since; but, notwithstanding the prodigious sacrifices which the people made, they accumulated capital so rapidly by reason of parsimony, that those who watched the financial condition of the republic made all sorts of guesses as to what could be the reason why enormous taxation was accompanied by a singularly low rate of interest, and at last some persons, absurdly enough, asserted that the taxation was itself the cause of the low rate.

Apart from imperial finance, the wealth of this country is liable to other levies imposed for local purposes. Most local taxation is direct, and imposed on occupation. Some, however, is indirect, and levied on consumption. Again, some local taxation is imposed in satisfaction of a local duty, some in consideration of a local service. Thus the duty on coals consumed within a particular radius from St. Paul's cathedral, originally, we are told, imposed in order to meet some of the losses incurred by the great fire of London, is a tax on consumption, analogous to the octroi duties imposed in Continental towns. The county and borough rates imposed for the maintenance of roads and of police, rates levied for the use of gas and water, are payments intended to be the equivalents of public service, and capable, with greater or less exactness, of being apportioned to the amount of benefit received by the taxpayer. Of late years some large towns have made use of their local needs for the purpose of creating capital on the security of rates and of deriving some of the profits of a joint-stock company from the sale of gas and water, with a view to lightening other local burdens of a more general kind. Under proper safeguards, such a form of local finance is beneficial and to be encouraged. It bears a close analogy to the Government service of the post office.

Local finance has followed in one particular the precedent supplied it by the central Government, in anticipating its revenue by loans. Most of these loans, however, are terminable, *i.e.*, provision is made for repayment of principal as well as interest. The amount of these loans is in excess of 100 millions, and is likely to increase. But most of the increased charge is to be put down to the head of remunerative outlay, there being, as we have stated, an increased disposition—indeed from necessity—on the part of local authorities to undertake the satisfaction of public services, or the supply of public conveniences. The aggregate annual expenditure of the United Kingdom for local and imperial taxation, including loans, is now about 125 millions.

The authorities relied on for this article are principally—for ancient history, Boeckh's *Public Economy of Athens*, and Dureau de la Malle. *Économie politique des Romains;* and for modern times—Macpherson's *Dictionary of Commerce;* Grellier's *History of the National Debt;* Porter's *Progress of the Nation;* Sir Stafford Northcote's *Twenty Years of Financial Policy; The Statutes at Large*, in the edition commencing from the first volume printed by Berthollet for Henry VIII. and continued in the same form to the present time; Hansard's *Parliamentary Debates*, etc. (J. E. T. R.)

FINCH (German *Fink*, Latin *Fringilla*), a name applied (but almost always in composition—as Bullfinch, Chaffinch, Goldfinch, Hawfinch, etc.) to a great many small birds of the Order *Passeres*, and now pretty generally accepted as that of a group or family—the *Fringillidæ* of most ornithologists. Yet it is one the extent of which must be regarded as being uncertain. Many writers have included in it the Buntings (*Emberizidæ*), though these seem to be quite distinct, and the grounds of their separation have been before assigned (*cf.* BUNTING, vol. iv. p. 470), as well as the Larks (*Alaudidæ*), the Tanagers (*Tanagridæ*), and the Weaver-birds (*Ploceidæ*)—the mode in which these three last differ having in due time to be shown in these pages. Others have separated from it the Crossbills, under the title of *Loxiidæ*, but without due cause (*cf.* CROSSBILL, vol. vi. p. 542), while again some systematists have placed among the Finches the Mouse-birds (*Coliidæ*)—an allocation which a very slight study of osteological characters would have proved to be unsound; and a group which has no English name, including probably the genera *Panurus* (the so-called Bearded Titmouse), *Paradoxornis*, and, perhaps, a few others, has also been occasionally referred to the Finches, to all appearance erroneously. The difficulty which at this time presents itself in regard to the limits of the *Fringillidæ* arises from our ignorance of the anatomical features, especially those of the head, possessed by many exotic forms.

Taken as a whole, the Finches concerning which no reasonable doubt can exist, are not only little birds with a hard bill, adapted in most cases for shelling and eating the various seeds that form the chief portion of their diet when adult, but they appear to be mainly forms which predominate in and are highly characteristic of the Palæarctic Region; moreover, though some are found elsewhere on the globe, the existence of but very few in the Notogæan hemisphere can as yet be regarded as certain.

But even with this limitation, the separation of the undoubted *Fringillidæ*[1] into groups is a difficult task. Were we merely to consider the superficial character of the form of the bill, the genus *Loxia* (in its modern sense) would be easily divided not only from the other Finches, but from all other birds. The birds of the genus—the Crossbills—when their other characters are taken into account, prove to be intimately allied on the one hand to the Grosbeaks (*Pinicola*) and on the other through the Redpolls (*Ægiothus*) to the Linnets (*Linota*)—if indeed these two can be properly separated. The Linnets, through the genus *Leucosticte*, lead to the Mountain-Finches (*Montifringilla*), and the Redpolls through the Siskins (*Chrysomitris*) to the Goldfinches (*Carduelis*); and these last again to the Hawfinches, one group of which (*Coccothraustes*) is apparently not far distant from the Chaffinches (*Fringilla* proper), and the other (*Hesperiphona*) seems to be allied to the Greenfinches (*Ligurinus*). Then there is the group of Serins (*Serinus*), to which the Canary-bird belongs, that one is in doubt whether to refer to the vicinity of the Greenfinches or that of the Redpolls. The Mountain-Finches (before named) may be regarded as pointing first to the Rock-Sparrows (*Petronia*) and then to the true Sparrows (*Passer*); while, returning to the Grosbeaks, we find them passing into many varied forms which regard to space forbids our here naming, and throwing out a very well marked form—the Bullfinches (*Pyrrhula*). But our readers must be prepared to take all this as problematical. Some of the modifications of the Family are very gradual, and therefore conclusions founded on them are likely to be correct; others are further apart, and the links which connect them, if not altogether missing, can but be surmised. To avoid as much as possible prejudicing the case, we shall therefore take the different groups of *Fringillidæ* which it is convenient to consider in this article in an alphabetical arrangement.

The BULLFINCHES thus present themselves first. Of these the best known to our readers will be the familiar bird (*Pyrrhula europæa*), which hardly needs description. The varied plumage of the cock—his bright red breast and his gray back, set off by his coal-black head and quills—is naturally attractive; while the facility with which he is tamed, with his engaging disposition in confinement, makes him a popular cage-bird,—to say nothing of the fact (which in the opinion of so many adds to his charms) of his readily learning to "pipe" a tune, or some bars of one, though this perversion of his natural notes is hardly agreeable to the ornithologist. By gardeners the Bullfinch has long been regarded as a deadly enemy, from its undoubted destruction of the buds of fruit-trees in spring-time, though whether the destruction is really so much of a detriment is by no means so undoubted. Northern and Eastern Europe is inhabited by a larger form (*P. major*), which differs in nothing but size and more vivid tints from that which is common in the British Isles and Western Europe. A very distinct species (*P. murina*), remarkable for its dull coloration, is peculiar to the Azores, and several others are found in Asia from the Himalayas to Japan. Recently a Bullfinch (*P. cassini*) has been discovered in Alaska, being the first recognition of this genus in the New World.

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[1] About 200 species of these have been described, and perhaps 150 may really exist.

The CANARY-BIRD (*Serinus canarius*) is indigenous to the islands whence it takes its name, as well, apparently, as to the neighboring groups of the Madeiras and Azores, in all of which it abounds. It seems to have been imported into Europe at least as early as the first half of the 16th century,[1] and has, as everybody knows, since become the commonest of cage-birds. The wild stock is of an olive-green, mottled with dark-brown above, and greenish-yellow beneath. All the bright-hued examples we now see in captivity have been induced by carefully breeding from any chance varieties that have shown themselves; and not only the color, but the build and stature of the bird have in this manner been greatly modified. Of late the ingenuity of "the fancy," which might seem to have exhausted itself in the production of topknots, feathered feet, and so forth, has brought about a still further change from the original type. It has been found that by a particular treatment, in which the mixing of large quantities of cayenne-pepper with the food plays an important part, the ordinary "canary yellow" may be intensified so as to verge upon a more or less brilliant flame color. Birds which have successfully undergone this forcing process, and hence called "hot canaries," command a very high price, for a large proportion die under the discipline, though it is said that they soon become exceedingly fond of the exciting condiment. But it is impossible here to treat of this species in its domesticated state. A small library of books has been written on the subject.[2]

Very nearly resembling the Canary-bird, but smaller in size, is the SERIN (*Serinus hortulanus*), a species which not long since was very local in Europe, and chiefly known to inhabit the countries bordering on the Mediterranean. It has of late years pushed its way towards the north, and has even been several times taken in England (Yarrell's *Brit. Birds*, ed. 4, ii. pp. 111–116). A closely allied species (*S. canonicus*) is peculiar to Palestine.

The CHAFFINCHES next demand our attention, and these are regarded as the type-form of *Fringillidæ*. The handsome and sprightly species (*Fringilla cœlebs*[3]), which is so common throughout the whole of Europe, requires no description. Conspicuous by his variegated plumage, his peculiar call-note,[4] and his glad song, the cock is almost everywhere a favorite. In Algeria our Chaffinch is replaced by a closely allied species (*F. spodogenia*), while in the Atlantic Islands it is represented by two others (*F. tintillon* and *F. teydea*)—all of which, while possessing the general appearance of the European bird, are clothed in soberer tints.[5] Another species of true *Fringilla* is the Brambling (*F. montifringilla*), which has its home in the birch forests of northern Europe and Asia, whence it yearly proceeds, often in flocks of thousands, to pass the winter in more southern countries. This bird is still more beautifully colored than the Chaffinch—especially in summer, when, the brown edges of the feathers being shed, it presents a rich combination of black, white, and orange. Even in winter, however, its diversified plumage is sufficiently striking.

With the exception of the single species of Bullfinch already noticed as occurring in Alaska, all the forms of Finches on which we have dwelt are peculiar to the Palæarctic Region. Consideration of some of the remaining forms which have been incidentally named is deferred. (A. N.)

FINCH, DANIEL and HENEAGE. See NOTTINGHAM, EARLS OF.

FINCK, HEINRICH, a celebrated German musical composer, of whose life little more is known than that he was of Saxon origin, and that between 1492 and 1506 he was chapelmaster to two successive kings of Poland, at whose court in Warsaw he resided. After this he seems to have retired to Wittenberg in Saxony, where he died. The year of his death, like that of his birth, is uncertain. His works, mostly part songs and other vocal compositions, show great musical knowledge, and amongst the early masters of the German school he holds a high position. They are found scattered amongst ancient and modern collections of songs and other musical pieces. The library of Zwickau possesses a work containing a collection of fifty-five songs by Finck, printed about the middle of the 16th century.

FINCK, HERMANN, the nephew of the subject of last notice, has frequently been mistaken for him. The date of his birth (at Pirna in Saxony) also is uncertain, but it has recently been discovered that in 1506 he succeeded his uncle in the position of royal chapelmaster to the king of Poland. After 1553 he lived at Wittenberg, and there, in 1555, was published his collection of "wedding songs." His most celebrated work is entitled *Practica musica, exempla variorum signorum, proportionum, et canonum, judicium de tonis ac quædam de arte suaviter et artificiose cantandi continens* (Wittenberg, 1557). It is of great historic value, but very rare. The Paris library, the Vienna court library, and the Prague library possess a copy each, and there are three or four copies in the royal library at Berlin.

FINDEN, WILLIAM (1787–1852), English line engraver, was born in 1787. He served his apprenticeship to one James Mitan, but appears to have owed far more to the influence of James Heath, whose works he privately and earnestly studied. His first employment on his own account was engraving illustrations for books, and among the most noteworthy of these early plates were Smirke's illustrations to Don Quixote. His neat style and smooth finish made his pictures very attractive and popular, and although he executed several large plates, his chief work throughout his life was book illustration. His younger brother, Edward Finden, worked in conjunction with him, and so much demand arose for their productions that ultimately a company of assistants was engaged, and plates were produced in increasing numbers, their quality as works of art declining as their quantity rose. The largest plate executed by William Finden was the portrait of King George IV. seated on a sofa, after the painting by Sir Thomas Lawrence. For this work he received two thousand guineas, a sum larger than had ever before been paid for an engraved portrait. The demand for this print was for a time so great that proofs were advertised at a price largely in advance of the publication price. But the reputation of the subject, of the painter, and of the engraver have alike declined. Finden's next works on a large scale were the Highlander's Return and the Village Festival, after Wilkie's well-known works, the latter now forming part of the national collection. These are esteemed as Finden's happiest works. Later in life he undertook, in co-operation with his brother, aided by their numerous staff, the publication as well as the production of various galleries of engravings. The first of these, a series of landscape and portrait illustrations to the life and works of Byron, appeared in 1833 and following years, and was a very successful venture. Other attempts of a like kind were less so; and by the last, the most costly, and by far the most deserving of success, both for its subjects and the quality of its workmanship, the *Gallery of British Art*, he lost the fruits of all his former success. Of this *Gallery* fifteen parts were published between 1838 and 1840. Finden's last undertaking was an engraving on a large scale of Hilton's Crucifixion, which was completed just before his death. The plate was bought by the Art Union for £1470. A few days before his death this industrious engraver joined with a few of his brothers in art in a petition to the queen for the admission of engravers to the honors of the Royal Academy. He died in London, unmarried, September 20, 1852.

FINE, in law, is a pecuniary penalty inflicted for the less serious offences. Fines are necessarily discretionary as to amount; but a maximum is generally fixed when the penalty is imposed by statute. And it is an old constitutional maxim that fines must not be unreasonable. In Magna Charta, c. 111, it is ordained "*Liber homo non amercietur pro parvo delicto nisi secundum modum ipsius delicti, et pro magno delicto secundum magnitudinem delicti.*"

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[1] The earliest published description seems to be that of Gesner in 1555 (*Orn.*, p. 234), but he had not seen the bird, an account of which was communicated to him by Raphael Seiler of Augsburg, under the name of *Suckervögele*.

[2] Those most to be commended are perhaps *The Canary Book* by Robert L. Wallace, *Canaries and Cage Birds* by W. A. Blackston, and of course Mr. Darwin's *Animals and Plants under Domestication* (vol. i. p. 295). An excellent monograph of the wild bird is that by Dr. Carl Bolle (*Journ. für Orn.*, 1858, pp. 125–151).

[3] This fanciful trivial name was given by Linnæus on the supposition (which later observations do not entirely confirm) that in Sweden the hens of the species migrated southward in autumn, leaving the cocks to lead a celibate life till spring. It is certain, however, that in some localities the sexes live apart during the winter.

[4] This call-note, which to many ears sounds like "pink" or "spink," not only gives the bird a name in many parts of Britain, but is also obviously the origin of the German *Fink* and our *Finch*. The similar Celtic form *Pinc* is said to have given rise to the Low Latin *Pincio*, and thence come the Italian *Pincione*, the Spanish *Pinzon*, and the French *Pinson*.

[5] This is especially the case with *F. teydea* of the Canary Islands, which from its dark coloring and large size forms a kind of parallel to the Azorean *Pyrrhula murina*.

The term is also applied to payments made to the lord of a manor on the alienation of land held according to the custom of the manor, to payments made on the renewal of leases granted by ecclesiastical and other corporations, and to other similar payments.

Fine also denotes a fictitious suit at law, which played the part of a conveyance of landed property. "A fine," says Blackstone, "may be described to be an amicable composition or agreement of a suit, either actual or fictitious, by leave of the king or his justices, whereby the lands in question become or are acknowledged to be the right of one of the parties. In its original it was founded on an actual suit commenced at law for the recovery of the possession of land or other hereditaments; and the possession thus gained by such composition was found to be so sure and effectual that fictitious actions were and continue to be every day commenced for the sake of obtaining the same security." Freehold estates could thus be transferred from one person to another without the formal delivery of possession which was generally necessary to a feoffment. This is one of the oldest devices of the law. A statute of 18 Edward I. describes it as the most solemn and satisfactory of securities, and gives a reason for its name—"Qui quidem finis sic vocatur, eo quod finis et consummatio omnium placitorum esse debet, et hac de causa providebatur." The action was supposed to be founded on a breach of covenant: the defendant, owning himself in the wrong,[1] makes overtures of compromise, which are authorized by the *licentia concordandi;* then followed the concord, or the compromise itself. These, then, were the essential parts of the performance, which became efficient as soon as they were complete; the formal parts were the *nots*, or abstract of the proceedings, and the *foot* of the fine, which recited the final agreement. Fines were said to be of four kinds, according to the purpose they had in view, as, for instance, to convey lands in pursuance of a covenant, to grant reversionary interest only, etc. In addition to the formal record of the proceedings, various statutes required other solemnities to be observed, the great object of which was to give publicity to the transaction. Thus by statutes of Richard III. and Henry VII. the fine had to be openly read and proclaimed in court no less than sixteen times. A statute of Elizabeth required a list of fines to be exposed in the Court of Common Pleas and at assizes. The reason for these formalities was the high and important nature of the conveyance, which, according to the Act of Edward I. above mentioned, "precludes not only those which are parties and privies to the fine and their heirs, but all other persons in the world who are of full age, out of prison, of sound memory, and within the four seas, the day of the fine levied, unless they put in their claim on the foot of the fine within a year and a day." This barring by *non-claim* was abolished in the reign of Edward III., but restored with an extension of the time to five years in the reign of Henry VII. The effect of this statute, intentional according to Blackstone, unintended and brought about by judicial construction according to others, was that a tenant-in-tail could bar his issue by a fine. A statute of Henry VIII. expressly declares this to be the law. Fines, along with the kindred fiction of recoveries, were abolished by statute 3 and 4 Will. IV. c. 74, which substituted a deed enrolled in the Court of Chancery.

Fines are so generally associated in legal phraseology with recoveries that it may not be inconvenient to describe the latter in the present place. A recovery was employed as a means for evading the strict law of entail. The purchaser or alienee brought an action against the tenant-in-tail, alleging that he had no legal title to the land. The tenant-in-tail brought a third person into court, declaring that he had warranted his title, and praying that he might be ordered to defend the action. This person was called the *vouchee*, and he, after having appeared to defend the action, takes himself out of the way. Judgment for the lands is given in favor of the plaintiff; and judgment to recover lands of equal value from the vouchee was given to the defendant, the tenant-in-tail. In a real action, such lands when recovered would have fallen under the settlement of entail; but in the fictitious recovery the vouchee was a man of straw, and nothing was really recovered from him, while the lands of the tenant-in-tail were effectually conveyed to the successful plaintiff. A recovery differed from a fine, as to *form*, in being an action carried through to the end, while a fine was settled by compromise, and as to effect, by barring all reversions and remainders in estates tail, while a fine barred the issue only of the tenant. (E. R.)

Preliminary definition.

FINE ARTS, THE. Fine art is the abstract or collective name given to the results of a whole group of human activities; the activities themselves which constitute the group being severally called the FINE ARTS. In antiquity the fine arts were not explicitly named, nor even distinctly recognized, as a separate class. In other modern languages besides English they are called by the equivalent name of the beautiful arts (*belle arti, beaux arts, schöne Künste*). The fine or beautiful arts, then, are those among the arts of man which minister, not to his material necessities or conveniences, but to his love of beauty (using the word beauty in its widest sense); or if any art fulfils both these purposes at once, still as fulfilling the latter only is it called a fine art. Thus architecture, in so far as it provides shelter and accommodation, is one of the useful or mechanical arts, and one of the fine arts only in so far as its structures give pleasure by the aspect of strength, fitness, harmony and proportion of the masses, by disposition and contrast of light and shade, by color and enrichment, by variety and relation of lines, surfaces, and intervals.

Conflicting results of inquiry into the nature of beauty.

There is no difference of opinion concerning the nature of fine art and the fine arts as thus generally described, and as contra-distinguished from art and the arts mechanical. It is acknowledged that the one set of arts exists to satisfy practical needs, and the other set exists to give delight and satisfy the sense of beauty, while as to an intermediate set of arts which exist for both purposes, it is possible to distinguish in each case the part which is beautiful or pleasurable from the part which is mechanical or merely useful. But as soon as we inquire further, and seek for more precise definitions, we find ourselves confronted with a mass of speculation and discussion as formidable as has been accumulated in any department of human thought. Granting that the fine arts are those of which the end is beauty, or beauty and use conjointly, the question next arises, what is beauty? and next, how does the beauty of art differ from the beauty of nature? and then, what place do the arts of beauty hold in the general scheme of things?—what are the relations of these activities and their results to the idea of the universe, to the faculties of man, and to each other? To such inquiries as these, enormous in extent and enormous in complexity, a separate place has been given in modern philosophy under the name Æsthetics. "It is the province of æsthetics," says Professor Ruskin, "to tell you (if you did not know it before) that the taste and color of a peach are pleasant, and to ascertain (if it be ascertainable, and you have any curiosity to know) why they are so." But in a less sarcastic and more extended definition, it would be said that the name Æsthetics is intended to designate a scientific doctrine or account of beauty in nature and art, and of the faculties for enjoying and for originating beauty which exist in man. Instead, however, of an accepted or uniform science, we find on these subjects a multitude of speculations as conflicting as they are voluminous; but yet conflicting more in appearance than in reality, because the source of their contradictions lies less in difference of judgment concerning the facts themselves, than in difference of doctrine concerning the abstract order of the universe in which those facts find a place, and in consequent diversity of method in arranging and of formula in interpreting the facts.

Plan of the present article.

Of the principal speculations of ÆSTHETICS the reader already possesses a synopsis under the proper heading. Our present task is of a different kind. We shall, indeed, as well as our space admits, endeavor to state what characters all the fine arts possess in common, and in what they severally differ from one another, as well as to lay down certain leading facts of their history; in other words, we shall submit (1) a definition of fine art in general, (2) a definition and classification of the fine arts severally, (3) some observations on their historical development. But in so doing, we shall not profess even to state the deeper problems either of metaphysics or psychology which will lie to right and left of our path, still less, as the exponents of any one philosophical system, to solve them. We shall simply take account of the facts and phenomena of the several arts as we find them in experience, and sum them up in the language of every day; keeping of necessity in view only the most salient features of the vast provinces of inquiry before us, and leaving particulars to be supplied under the headings of the individual arts. And when, as will sometimes happen, we do quote the formulas and refer to the systems of philosophers, it will be not as adopting any of them for better for worse, but as finding suggestions in all of them by turns; since, though one body of speculative doctrine may be no truer than another, yet each brings forward some aspect and contains some presentment of the truth; and a complicated mass of facts, when it is arranged in the order and expressed in the terms of a system, may not be essentially the clearer, but is usually the better marshalled for review.

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[1] Hence called *cognizor;* the other party, the purchaser, is the *cognizee.*

Distinction between art and nature: premeditation essential to art.

At the threshold it will be necessary that we should call to mind the terms of our own definition of art in general (see ART). According to the popular distinction between art and nature, the idea of art only includes phenomena of which man is the cause—and that, when he acts not spontaneously, but with calculation, not from impulse, but from forethought; while the idea of nature includes all phenomena, both in man and in the world outside him, which take place without forethought or studied initiative of his own. This distinction we saw reason to recognize as practically valid. Art, we said accordingly, means every regulated operation or dexterity whereby we pursue ends which we know beforehand; and it means nothing but such operations and dexterities. That which any one does without thinking about it, and without considering what he is doing it for, is not art at all. Hence we shall not allow the title of fine art to natural eloquence, to charm or dignity of manner, to delicacy and tact in social intercourse, and other graces of life and conduct for which such a title is sometimes claimed, though they really proceed from an unconscious gift or unreflecting habit in those who exhibit them. All these are manifestations of the beautiful, and in witnessing them we experience a pleasure analogous, no doubt, to the pleasures of fine art. Nevertheless, so far as such manifestations are spontaneous, they are not arts, but, as we have called them, graces; they are due, as Greek theology would have expressed it, not to the teaching of Athênê but to the gift of the Charites. When the exigences of a deductive and ontological system lead a writer like Dr. Robert Zimmermann, of Vienna, to co-ordinate these spontaneous acts or traits of beautiful and expressive behavior with the deliberate artistic activities of the race, we feel that he is sacrificing to system a distinction which is essential. That distinction common parlance very justly observes, with its opposition of "art" to "nature," and its phrase of "second nature" for those habits which have become so ingrained as to seem spontaneous, whether originally the result of discipline or not. One of the essential qualities of art is premeditation; and when Shelley talks of the skylark's profuse strains of *unpremeditated art*, he in effect lays emphasis on the fact that it is only by a metaphor that he uses the word art in this case at all; he calls attention to that which (if the songs of birds are as instinctive as we suppose) precisely makes the difference between the skylark's outpourings and his own. For example, when we see a person in all whose ordinary movements there are freedom and beauty, we put down the charm of these to inherited and inbred physical aptitudes of which the person has never thought, and call it nature; but when we go on to notice that the same person is beautifully and appropriately dressed, since we know that it is impossible to dress without thinking of it, we put down the charm of this to judicious forethought and calculation, and call it art. Again, it is an established and a just practical maxim of the dramatic art, that the actor who, in the moment of performance really and involuntarily surrenders himself to the emotions of his part and situation, though he may rouse the sympathies of the audience by a natural exhibition of feeling, yet is not acting like an artist, and does not produce as much effect, nor an effect of the same kind, as he does when, master of himself, he goes through a series of utterances and gestures which he has deliberately conceived and rehearsed beforehand. The task of art is not, in either of the above instances, to create a product outside of or separate from the artist. The material upon which the artist has in these cases to work consists of his or her own natural aptitudes: aptitudes, in the one case, of personal charm, which have to be made the most of by appropriate adornment; aptitudes, in the other case, for mimicry and emotional expression, which have to be made the most of by study and practice. In such instances it may often be hard to separate the share of nature from the share of art in the result—to determine where grace ends and calculation begins, or where ends the sympathetic power of natural expression, and where begins the properly artistic power of studied and premeditated expression. Perhaps no writer has observed the differences or laid down the boundary-lines between these adjacent kingdoms of artlessness and art with more acuteness than Schleiermacher. But we have said enough to mark for the present purpose the reality and importance of the distinction. And having thus secured ourselves against the intrusion among fine arts of those phases of beauty in human act and utterance which justly belong not to art at all, but nature, we can enter upon what is our proper business, the delimitation of the separate place and functions of the fine arts among the rest of the arts and among each other.

I. OF FINE ART IN GENERAL.

The pleasures of fine art essentially a communicable order of pleasures.

When we say of the fine arts as a group that they are activities which minister to the love of beauty in man, it is as if we said the tailor's art is an activity which ministers to his need of clothes; and the inference is, in the one case as in the other, that a separate class of men is to be found in every community devoted to this particular employment. And such, practically, we all know to be the case; the gifts and calling of the artist constitute a separate profession, a profession of the producers, so to speak, of fine art, while the rest of the community are enjoyers or recipients of the fine art produced. In the most primitive societies, undoubtedly, this was not so, and we can go back to an original or rudimentary stage of every fine art at which the separation between a class of producers or performers, and a class of recipients, does not exist. Such an original or rudimentary stage of the dramatic art, for instance, we are accustomed to witness in children, who will occupy themselves at all moments with mimicry and make-believe for their own satisfaction, and without the least regard to the presence or absence of witnesses. The original or rudimentary type of the profession of imitative sculptors or painters is the cave-dweller of the palæolithic age, who, when he rested from his day's hunting, first took up the bone handle of his weapon, and with a flint either carved it into the shape, or on its surface scratched the outlines, of the animals of the chase. The original or rudimentary type of the architect, considered not as a mere builder, but as an artist, is the savage who, when his tribe had taken to live in tents or huts instead of caves, first arranged the skins and timbers of his tent or hut in one way because it pleased his eye, rather than in some other way which was as good for shelter. The original type of the artificer or maker of household implements, considered in the same light, was the other savage who first took it into his head to fashion his club or spear in one way rather than in another way as good for killing, and to ornament it with tufts or markings. In none of these cases had the primitive artist any reason for pleasing anybody but himself. Again, the original or rudimentary type of lyric song and dancing arose when the first reveller clapped hands and stamped or shouted in time, in honor of his god, in commemoration of a victory, or in mere obedience to the blind stirring of a rhythmic impulse within him; and to such a display the presence or absence of witnesses does not signify at all. The original type of the instrumental musician is the shepherd who first notched a reed and drew sounds from it while his sheep were cropping. The father of all artists in dress and personal adornment was the first wild man who tattooed himself or bedecked himself with shells and plumes. But in both of these last instances, it may be said, the primitive artist surely had the motive of pleasing not himself only, but his mate, or the female whom he desired to be his mate? However that may be, it is clear that what any one can enjoy by himself, whether in the way of musical sounds or personal adornments, or in the way of mimicry, of rhythmical movements, of imitative or ornamental carving and drawing, of the disposition and adornment of dwelling places and utensils—the same things, it is clear, others *can* also enjoy with him. For these and similar things to give pleasure, it is not essential that others should be by; but the pleasures they give are essentially of a kind in which others can, if they are by, participate.

Separation of the classes who produce and those who receive pleasures of fine art.

And so, with the growth of societies, it comes about that one class of persons separate themselves, and become the ministers or producers of this kind of pleasures, while the rest become the persons ministered to, the participators in or recipients of the pleasures. Artists are those members of a society who are so constituted as to feel more acutely than the rest certain classes of pleasures which all can feel in their degree. By this fact of their constitution they are impelled to devote their active powers to the production of such pleasures, to the making or doing of some of those things which they enjoy so intensely when they are made and done by others. At the same time the artist does not, by assuming these ministering or creative functions, surrender his enjoying or receptive functions. He continues to participate in the pleasures of which he is himself the cause, and remains a conscious member of his own public. The architect, sculptor, painter, are able respectively to stand off from and appreciate the results of their own labors; the singer enjoys the sound of his own voice, and the musician of his own instrument; the poet, according to his temperament, furnishes the most enthusiastic or the most fastidious reader for his own stanzas. Neither, on the other hand, does the person who is an habitual recipient from others of the pleasures of fine art, forfeit the privilege of producing them according to his capabilities, and of becoming, if he has the power, an amateur or occasional artist. Nay, these opposite functions of producing and enjoying the fruits of production, of ministering and being ministered to, are much more commonly combined in this than in other departments of human exertion. Nearly every one is ready to be the minister, if he can, of his own higher pleasures, and therefore to be his own singer or poet, his own architect, sculptor, or painter. Few are ready to be ministers of their own lower needs, and to be their own tailors, their own butchers (except in the case of wild game, the killing of which, being superfluous, possesses an attraction of which necessary killing is devoid), their own cobblers, cooks, servants, and the rest. In spite, however, of such combination or interchange of functions, we may, both practically and for the purposes of the present discussion, regard the artist as belonging generally to one category and the rest of the world to another. We may separate in our consideration those phenomena which attend the production of fine art, or exercise of the æsthetic activities, from those phenomena which attend the enjoyment of fine art, or contemplation of the results of such exercise.

Negative part of first definition to be followed up.

For the rest, of the two parts of which our preliminary definition consisted, we shall gain most by letting alone the one and following out the other. If we take up the affirmative part, in which we said that the fine arts are those which minister to our love of beauty, and if we try to develop and complete that, we shall have, for one thing, to explain how the love of beauty, in the wide and somewhat loose sense in which we here use the phrase, means a faculty which man possesses for taking keen and permanent delight in the contemplation and the imagination of many kinds of things, including some not strictly to be called beautiful, such as grotesqueness, comicality, even ugliness itself, when they are presented in typical forms. For another thing, we shall be very apt to find ourselves arguing in a circle, and saying, such and such an art is fine because it produces beauty, and such and such a thing is beautiful because it is produced by fine art. But if we take up the negative part of our definition, in which we only said that the fine arts are arts which exist independently of practical necessity or utility, and if we try to follow out this, we shall find that here we have got hold of a character of the fine arts which at once presents instructive aspects and far-reaching consequences. Indeed, the greater part of those other characters, or common properties of whatever kind, which have been recognized by consent as peculiar to the group of fine arts, will appear on examination to be implied in, or deducible from, this one fundamental character.

The pleasures of fine art are disinterested as well as communicable.

Let us take first, among such common properties, one relating to the frame of mind, or moral attitude, so to call it, which accompanies the reception as distinguished from the production of æsthetic pleasure. It is an observation as old as Aristotle that such pleasures differ from most other pleasures of experience in that they are disinterested. That is to say, of course not disinterested in the sense in which that word implies the positive ethical virtue of self-abnegation, or preferring others to one's self; but disinterested in the sense that they are not such as nourish a man's body nor add to his riches; they are not such as can gratify him, when he receives them, by the sense of advantage or superiority over his fellow creatures; they are not such as one human being can in any sense receive exclusively from the object which bestows them. We have partly learned as much already in glancing at the origins or rudimentary stages of the several fine arts, when we saw that, whether the primitive artist meant it or not, his operations were capable at any rate of pleasing others besides himself. To turn to their developed stages, it is evidently characteristic of a beautiful building that its beauty cannot be monopolized, but can be seen and admired by the inhabitants of a whole city and by all visitors for all generations. The same thing is true of a picture or a statue, except in so far as an individual possessor may choose to keep such a possession to himself, in which case his pride of monopoly is a sentiment wholly independent of his pleasure in artistic contemplation (and as a rule we practically find that the heir or collector who takes most pleasure in his treasures of art is also the readiest to make them accessible to others). Similarly, music is composed to be sung or played for the enjoyment of many at a time, and for such enjoyment a hundred years hence as much as to-day. Poetry is written to be read by all readers for ever who care for the ideas and feelings of the poet, and can apprehend the meaning and melody of his language. If we consider other pleasures which might seem to be analogous to those of fine art, but to which common consent yet declines to allow that character, we shall see that one reason is, that such pleasures are not in their nature thus disinterested. Thus the senses of smell and taste have pleasures of their own like the senses of sight and hearing, and pleasures neither less poignant nor very much less capable of fine graduation and discrimination than those. Why, then, are the experiences of these senses not called beautiful? and why is the title of fine art not claimed, or only claimed in jest, for any skill in arranging and combining them? Why are there no arts of savors and perfumes corresponding in rank to the arts of forms, colors, and sounds? An answer commonly given is that sight and hearing are intellectual and therefore higher senses, that through them we have our avenues to all knowledge and all ideas of things outside us; while taste and smell are unintellectual and therefore lower senses, through which few such impressions find their way to us as help to build up our knowledge and our ideas. To this it may be replied that music, in its perfect or developed state, the accomplished fine art, that is, of sounds, deals precisely with those modes and relations of sound, pure sound as apart from words, which least convey knowledge or definite ideas, and can so far at least be called intellectual. The reply is far from complete; still, a more satisfactory reason than the above why there are no fine arts of taste and smell, or at best but humble fine arts half ironically so called, is this, that savors and perfumes yield only private pleasures, which it is not possible to build up into separate and durable schemes such that every one may have the benefit of them, and such as cannot be monopolized or used up. If against this it is contended that what the programme of a performance is in the musical art, the same is a *menu* in the culinary, and that practically it is no less possible to serve up a thousand times and to a thousand different companies the same dinner than the same symphony, we must fall back upon that still more fundamental form of the distinction between the æsthetic and non æsthetic bodily senses, upon which the physiological psychologists of the English school lay stress. We must say that the pleasures of taste and smell cannot be æsthetic pleasures, or pleasures of fine art, because their enjoyment is too closely associated—in the case of taste inseparably—with the most indispensable and the most strictly personal of utilities, eating and drinking. To pass from these lower pleasures to the highest; consider the nature of the delight derived from the contemplation, by the person who is happy enough to be their object, of the signs and manifestations of love. That at least is a beautiful experience; why is the pleasure which it affords not an artistic pleasure either? Why, in order to receive an artistic pleasure from human signs and manifestations of this kind, are we compelled to go the theatre, and see them exhibited in favor of a third person, who is not really their object any more than ourselves? This is so, for one reason, evidently, because of that difference between art and nature on which we have already dwelt. Not to art, but to nature and life, belongs love where it is really felt, with its attendant train of hopes and fears, momentous passions and contingencies. To art belongs love displayed where it is not really felt; and in this sphere, along with reality and spontaneousness of the display, and along with its momentous bearings, there disappear all those elements of pleasure in its contemplation which, however exquisite, are not disinterested—the elements of personal exultation, of gratitude and self-congratulation, the pride of favor found, the delight of exclusive possession or acceptance, all these emotions, in short, which can be summed up in the lover's triumphant monosyllable, "Mine." Only when those personal emotions are absent can the properly æsthetic emotions or pleasures of fine art find place. That in witnessing a dramatic performance, part of the spectator's enjoyment consists in sympathetically identifying himself with the lover, may be true, but cannot affect the argument, since at the same time he is well aware that every other spectator present may be similarly engaged with himself.

This is because the arts are independent of utility.

Thus, from the lowest point of the scale to the highest, we may observe that the element of personal advantage or monopoly in human gratifications seems to exclude them from the kingdom of fine art. The pleasures of fine art seem to define themselves as pleasures of delighted contemplation, but of such contemplation only when it is disinterested. Now, the negative part of our first definition was that the fine arts were arts having nothing to do with the satisfaction of practical necessities or supply of practical utilities. So far as the necessity of anything implies its necessity to the sustenance or comfort of the individual apart from others, and so far as its utility implies its capacity of being used by one to the exclusion of others, our new observation, it is evident, does but confirm that first statement; repeating it as to a part of the ground which it covers, and drawing out a part of its consequences in the moral and social sphere.

The fine arts cannot be practised by rule and precept; this also is because they are independent of utility.

Next, let us consider another generally accepted observation concerning the nature of the fine arts, and one, this time, relating to the disposition and state of mind of the artist himself. The observation we mean is this, that while for success in other arts it is only necessary to learn their rules, and to apply them until practice gives facility, in the fine arts rules and their application will carry but a little way towards success. All that can depend on rules, on knowledge, and on the application of knowledge by practice, the artist must indeed acquire, and the acquisition is often very complicated and laborious. But outside of and beyond such acquisitions, he must trust to what is called genius or imagination, that is, to the spontaneous working together of an incalculably complex group of faculties, reminiscences, preferences, emotions, instincts, in his constitution. Now, if we consider this characteristic of the activities of the artist, we shall see that it is a direct consequence or corollary of the fundamental fact that the art he practises is independent of utility: thus. A useful end is necessarily a determinate and prescribed end. To every end which is determinate and prescribed there must be one road which is the best. Skill in any useful art means knowing practically, by rules and the application of rules, the best road to the particular ends of that art. Thus the farmer, the engineer, the carpenter, the builder so far as he is not concerned with the look of his buildings, the weaver so far as he is not concerned with the designing of the patterns which he weaves, these and the hundred other varieties of craftsmen or artificers in a community, possess each his separate skill, but a skill to which fixed problems are set, and which, if it indulges in new inventions and combinations at all, can indulge them only for the sake of an improved solution of those particular problems and no others. The solution once found, the invention once made, its rules can be written down, or at any rate its practice can be imparted to others, who will apply it in their turn. Whereas no man can write down, in a way that others can act upon in their turn, how Beethoven conquered unknown kingdoms in the world of harmony, and established new laws by the inspired violation of old; or how Rembrandt turned the aspects of spiritual abjectness and physical gloom into pictures as worthy of contemplation as those into which the Italians had for ages turned the aspects of spiritual exaltation and shadowless day. The reason why the operations of the artist thus differ from the operations of the ordinary craftsman or artificer is that his ends, being ends other than useful, are not determinate nor fixed as theirs are. He has large liberty to choose his own problems, and may solve each of them in a thousand different ways according to the prompting of his own ordering or creating instincts. The musical composer has the largest liberty of all. Having learned what is learnable in his art, having mastered the complicated and laborious rules of musical form, having next determined the particular class of the work which he is about to compose, he has then before him the whole inexhaustible world of appropriate successions and combinations of emotional sound. He is merely directed and not fettered, in the case of song, cantata, oratorio, or opera, by the sense of the words which he has to set. The poverty or splendor of the result depends absolutely on his possessing or failing to possess powers which can neither be trained in, nor communicated to, any man. And this double freedom, alike from practical service and from the representation of definite objects, is what makes music in a certain sense the typical fine art, or art of arts. Architecture shares one-half of this freedom. It has not to imitate natural objects; for this service it calls in sculpture to its aid; but architecture is without the other half of freedom altogether. The architect has a sphere of liberty in the disposition of his masses, lines, colors, alternations of light and shadow, of plain and ornamented surface, and the rest; but upon this sphere he can only enter on condition that he at the same time fulfils the strict practical task of supplying the required accommodation, and obeys the strict mechanical necessities imposed by the laws of weight, thrust, support, resistance, and other properties of solid matter. In the imitative arts, the sculptor, the painter, the poet, has each in like manner his sphere of necessary facts, rules, and conditions corresponding to the nature of his task. The sculptor must be intimately versed in the facts of the human frame and the rules and conditions for its representation in solid form; the painter in a much more extended range of natural facts and appearances, and the rules and conditions for representing them on a plane surface; the poet's art of words has its own not inconsiderable basis of positive and disciplined acquisition. So far as rules, precepts, measurements, and other communicable laws or secrets can carry the artist, so far also the spectator can account for, analyze, and, so to speak, tabulate the effects of his art. But the essential character of the artist's operation, its very bloom and virtue, lies in those parts of it which fall outside this range of regulation on the one hand and analysis on the other. His merit varies according to the felicity with which he is able, in that region, to exercise his free choice and frame his individual ideal, and according to the tenacity with which he strives to grasp and realize his choice, or to attain perfection according to that ideal. Of the amplitude of that freedom, of the complex and unsearchable secrets of that felicity, of the honorableness of that pursuit after perfection, men in general have expressed their consciousness when they have called these the fine or beautiful arts; thereby signifying not less their admiration of the nature of the operation than their pleasure in its results. Corresponding, then, to the fact, concerning the ends or purposes of the mechanical and the fine arts respectively, that those exist for use and these independently of use—we get the further fact, concerning the respective modes of their pursuit, that the mechanical arts can be rightly practised by strict adherence to rule and precept, while the fine arts, though they have technical foundations which are matters of rule and precept too, can yet be rightly practised only by following, in a region outside the reach of rule and precept, the free prompting of some of the finest faculties of the spirit.

Relative shares of art and mechanism in what are known as art-manufactures and art-industries.

In an age when the power and province of mechanical art are daily expanding, it is worth while in this connection to inquire in what way such expansion affects the power and province of fine art. The great practical movement of the world in our age is a movement for the development of mechanical inventions and multiplication of mechanical products. So far as these inventions are applied to purposes purely useful, and so far as their products do not profess to offer anything delightful to contemplation, this movement in no way concerns our argument. But there is a vast multitude of products which do profess qualities of pleasantness, and upon which the ornaments intended to make them pleasurable are bestowed by machinery, and in speaking of which we are accustomed to the phrases art-industry, industrial art, art-manufactures, and the like. It concerns us to know what relation the fine arts really hold to these. The answer is, that the industry or ingenuity which directs the machine is not fine art at all, since the object of the machine is simply to multiply as easily and as perfectly as possible a definite and prescribed impress or pattern. This is equally true whether the machine is a perfectly simple one, like the engraver's press, for producing and multiplying impressions from an engraved plate, or a highly complex one, like the loom, in which elaborate patterns of carpet or curtain are set for weaving. In both cases there exists behind the mechanical industry an industry which is one of fine art in its degree. In the case of the engraver's press, there exists behind the industry of the printer the art of the engraver, which, if the engraver is also the free inventor of the design, is then a fine art, or if he is but the interpreter of the invention of another, is then in its turn a semi-mechanical appliance in aid of the fine art of the first inventor. In the case of the weaver's loom there is, behind the mechanical industry which directs the loom at its given task, the fine art, or what ought to be the fine art, of the designer who has contrived the pattern. In the case of the engraving, the mechanical industry of printing only exists for the sake of bringing out and disseminating abroad the fine art employed upon the design. In the case of the carpet or curtain, the fine art is only called in to make the product of the useful or mechanical industry of the loom acceptable, since the eye of man is so constituted as to receive pleasure or the reverse of pleasure from whatever it rests upon, and it is to the interest of the manufacturer to have his product so made as to give pleasure if it can. Whether the machine is thus a humble servant to the artist, or the artist a kind of humble purveyor to the machine, the fine art in the result is due to the former alone; and in any case it reaches the recipient at second-hand, having been put in circulation by a medium not artistic but mechanical. So far, then, as the adoption of mechanical agencies causes an increasing number of people to buy the same print, or decorate their apartments with the same hangings, or wear the same pattern, where before each community or section of a community used products according to its individual taste and tradition, so far such adoption tends to reduce the number of first-hand artistic inventions, or total quantity of fine art, in the world. There is no greater mistake than to suppose that the expansion of what are called art-industries is necessarily tantamount to an increase or propagation of fine art; it is only tantamount to an increase or propagation of particular decorations mechanically multiplied; and is a thing desirable or not according as the decorations so multiplied replace something better or worse than themselves.

Again, with reference not to the application of mechanical contrivances but to their invention,—is not, it may be inquired, the title of artist due to the inventor of some of the astonishingly complex and astonishingly efficient machines of modern times? Does he not spend as much thought, labor, genius, as any sculptor or musician in perfecting his construction according to his ideal, and is not the construction when it is done—so finished, so responsive in all its parts, so almost human—is not that worthy of the name of fine art? Nay, we must reply, for the inventor has a definite and practical end before him; his ideal is not *free*; he deserves all credit as the perfector of a particular instrument for a prescribed function, but an artist, a free follower of the fine arts, he is not.

The fine arts a kind of play.

Lastly, let us consider one common observation more concerning the nature of the fine arts, though in effect it too does but affirm, in a somewhat new light, that negative definition on which we have dwelt so much already. The fine arts, it is said, are activities which men put forth, not because they need but because they like. They have the activity to spare, and to put it forth in this way pleases them. Fine art is to mankind what play is to the individual, a free and arbitrary vent for energy which is not needed to be spent upon tasks concerned with the conservation, perpetuation, or protection of life. To insist on the superfluous or optional character of the fine arts, to call them the play or pastime of the human race as distinguished from its inevitable and sterner tasks, is obviously only to reiterate our fundamental distinction between the fine arts and the useful or necessary. But the distinction, as expressed in this particular form, has been interpreted in a great variety of ways, and followed out to an infinity of conclusions, conclusions regarding both the nature of the activities themselves and the character and value of their results.

The English psychology of association.

For instance, starting from this saying that the æsthetic activities are a kind of play, the English psychology of association goes back to the spontaneous cries and movements of children, in which their superfluous energies find a vent. It then enumerates pleasures of which the human constitution is capable apart from direct advantage or utility. Such are the primitive or organic pleasures of sight and hearing, and the secondary or derivative pleasures of association or unconscious reminiscence and inference that soon become mixed up with these. Such are also the pleasures derived from following any kind of mimicry, or representation of things real or like reality. It describes the grouping within the mind of predilections based upon these pleasures; it shows how the growing organism learns to govern its play, or direct its superfluous energies, in obedience to such predilections, till in mature individuals, and still more in mature societies, a highly regulated and accomplished group of leisure activities are habitually employed in supplying to a not less highly cultivated group of disinterested sensibilities their appropriate artistic pleasures.

Again, in the views of an ancient philosopher, Plato, and a modern poet, Schiller, the consideration that the artistic activities are in the nature of play, and the manifestations in which they result independent of realities and utilities, has led to judgments so differing as the following.

Plato.

Plato held that the daily realities of things in experience are not realities indeed, but only far-off shows or reflections of the true realities, that is, of certain ideal or essential forms which can be apprehended as existing by the mind. Holding this, Plato saw in the works of fine art but the reflections of reflections, the shows of shows, and depreciated them according to their degree of remoteness from the ideal, typical, or sense-transcending existences. He sets the arts of medicine, agriculture, shoemaking, and the rest, above the fine arts, inasmuch as they produce something serious or useful (*σπουδαιόν τι.*) Fine art, he says, produces nothing useful, and makes only semblances (*εἰδωλοποιϊκή*), whereas what mechanical art produces are utilities, and even in the ordinary sense realities (*αὐτοποιητική*).

Schiller, and the theory of the *Spieltrieb.*

In another age, and thinking according to another system, Schiller, so far from holding thus cheap the kingdom of play and show, regarded his sovereignty over that kingdom as the noblest prerogative of man. Schiller wrote his famous *Letters on the Æsthetic Education of Man* in order to throw into popular currency, and at the same time to modify and follow up in a particular direction, certain systematic doctrines which had lately been launched upon the schools by Kant. The spirit of man, said Schiller after Kant, is placed between two worlds, the physical world or world of sense, and the moral world or world of will. Both of these are worlds of constraint or necessity. In the sensible world, the spirit of man submits to constraint from without; in the moral world, it imposes constraint from within. So far as man yields to the importunities of sense, in so far he is bound and passive, the mere subject of outward shocks and victim of irrational forces. So far as he asserts himself by the exercise of will, imposing upon sense and outward things the dominion of the moral law within him, in so far he is free and active, the rational lord of nature and not her slave. Corresponding to these two worlds, he has within him two conflicting impulses or impulsions of his nature, the one driving him towards one way of living, the other towards another. The one, or sense-impulsion, Schiller thinks of as that which enslaves the spirit of man as the victim of matter, the other or moral impulsion as that which enthrones it as the dictator of form. Between the two the conflict at first seems inveterate. The kingdom of brute nature and sense, the sphere of man's subjection and passivity, wages war against the kingdom of will and moral law, the sphere of his activity and control, and every conquest of the one is an encroachment upon the other. One of the two, it seems, must win. The man, it seems, must either be slave or master; he must either obey the impulsion of matter, and let sense and outward shocks lay upon him the constraint of nature, or he must obey the impulsion of form, and must control and subjugate sense under the constrait of moral reason and the will. Is there, then, no hope of truce between the two kingdoms, no ground where the two contending impulses can be reconciled? Must a man either abandon law and give way to sense absolutely, or else absolutely set up law and put down sense? Nay, the answer comes, there is such a hope; such a neutral territory there exists. Between the passive kingdom of matter and sense, where man is compelled to blindly feel and be, and the active kingdom of law and reason, where he is compelled sternly to will and act, there is a kingdom where both sense and will may have their way, and where man may give the rein to all his powers. But this middle kingdom does not lie in the sphere of practical life and conduct. In practical life and conduct you cannot yield to both impulsions at once; let yourself go, in that sphere, to the allurements of sense, and you cast off law; maintain law, and you mortify sense. It is in the sphere of those activities which neither subserve any necessity of nature, nor fulfil any moral duty, that the middle kingdom lies where sense and reason can be reconciled. Towards activities of this kind we are driven by a third impulsion of our nature not less essential to it than the other two, the impulsion, as Schiller calls it, of Play. Relatively to real life and conduct, play is a kind of harmless show; it is that which we are free to do or leave undone as we please, and which lies alike outside the sphere of needs and duties. In play we may do as we like, and no mischief will come of it. In this sphere man may put forth all his powers without risk of conflict, and may invent activities which will give a complete ideal satisfaction to the contending faculties of sense and will at once, to the impulses which bid him feel and enjoy the shocks of physical and outward things, and the impulse which bids him master such things, control, and regulate them. In play you may impose upon Matter what Form you choose, and the two will not interfere with one another or clash. The kingdom of Matter and the kingdom of Form thus harmonized, thus reconciled by the activities of play and show, will in other words be the kingdom of the Beautiful. Follow the impulsion of play, and to the beautiful you will find your road; the activities you will find yourself putting forth will be the activities of æsthetic creation—you will have discovered or invented the fine arts. "Midway," these are Schiller's own words, "midway between the formidable kingdom of natural forces and the hallowed kingdom of moral laws, the impulse of æsthetic creation builds up a third kingdom unperceived, the gladsome kingdom of play and show, wherein it emancipates man from all compulsion alike of physical and of moral forces." Schiller, the poet and enthusiast, thus making his own application of the Kantian metaphysics, goes on to set forth how the fine arts, or activities of play and show, are for him the typical, the ideal activities of the race, since in them alone is it possible for man to put forth his whole, that is his ideal self. "Only when he plays is man really and truly man." "Man ought only to play with the beautiful, and he ought to play with the beautiful only." "Education in taste and beauty has for its object to train up in the utmost attainable harmony the whole sum of the powers both of sense and spirit." And the rest of Schiller's argument is addressed to show how the activities of artistic creation, once invented, quickly react upon other departments of human life, how the exercise of the play impulse prepares men for an existence in which the inevitable collision of the two other impulses shall be softened or averted more and more. That harmony of the powers which clash so violently in man's primitive nature, having first been found possible in the sphere of the fine arts, reflects itself, in his judgment, upon the whole composition of man, and attunes him, as an æsthetic being, into new capabilities for the conduct of his social existence.

Merits and demerits of the theory of Schiller.

Our reasons for dwelling on this wide and enthusiastic formula of Schiller's are both its importance in the history of reflection—it produced, indeed, so great an impression that it may still be called a formula almost classical—and its positive value. The notion of a sphere of voluntary activity for the human spirit, in which, under no compulsion of necessity or conscience, we order matters as we like them apart from any practical end, seems at least co-extensive with the widest conception of fine art and the fine arts. It insists on and brings into the light the essential point of the free, or as we have called it, the optional character of these activities, as distinguished from others to which we are compelled by necessity or duty. It also insists on and brings into the light what is no less essential, the fact that these activities, superfluous as they are from the points of view of necessity and of duty, spring nevertheless from an imperious and a saving instinct of our nature. It does justice to the part which is, or at any rate may be, filled in the world by pleasures which are apart from profit, and by delights for the enjoyment of which men cannot quarrel. It claims the dignity they deserve for those shows and pastimes in which we have found a way to make permanent all the transitory delights of life and nature, to turn our very tears and yearnings, by their artistic utterance, into sources of appeasing joy, to make amends to ourselves for the confusion and imperfection of reality by conceiving and imaging forth the semblances of things clearer and more complete, since in contriving them we incorporate with the experiences we have had the better experiences we have dreamed of and longed for.

Schiller's theory may thus be no explanation of the essential nature and place in the universe of these activities and their results; it will certainly be none for those to whom the Kantian doctrine of metaphysical opposition between the senses and the reason has no meaning. Neither can his particular application of that doctrine, with its terminology of *Stofftrieb*, *Formtrieb*, and *Spieltrieb*, the three impulses, or impulsions, of Matter, Form, and Play, be considered altogether happy. Nevertheless the theory furnishes us with a suggestive approach to a working definition, and has remained a fruitful one for many minds independently of the metaphysical doctrines upon which it was based. Its great fault is that, though it asserts that man man ought only to play with the beautiful, and that he is his best or ideal self only when he does so, yet it does not sufficiently determine what kinds of play are beautiful nor why we are moved to adopt them. It does not sufficiently show how the delights of the eye and spirit in contemplating forms, colors, and movements, of the ear and spirit in apprehending musical and verbal sounds, or of the whole mind at once in following the comprehensive current of images called up by poetry—it does not sufficiently show how delights like these differ from those yielded by other kinds of play or pastime, and between them make up the whole kingdom of artistic pleasures.

Pleasures of fine art compared with those of the chase, athletics, etc.

The chase, for instance, is a play or pastime which gives scope for any amount of premeditated skill; it has pleasures, for those who take part in it, which are in some degree analogous to the pleasures of the artist; and we all know the claims made on behalf of the noble art of venerie by the knights and woodmen of Walter Scott's romances. But here we must remember that, though the chase is play to us, who in civilized communities follow it on no plea of necessity, yet to a not remote ancestry it was earnest; in primitive societies hunting does not belong to the class of optional activities at all, but is among the most pressing of utilitarian needs. And this character of its origin and history might exclude it from the class of fine arts, even if there were not the further fact that the pleasures of the sportsman are the only pleasures arising from the chase; his exertions afford pain to the victim, and no satisfaction to any class of recipients but himself; or at least the pleasures of the bystanders at a meet or a battue are hardly to be counted as pleasures of artistic contemplation. Again, it may be said that such a theory does not sufficiently exclude from among the fine arts the class of athletic games or sports, not connected with the chase, though these do afford pleasure to multitudes, and most communities, especially our own, are accustomed to devote to them much trained skill and a large portion of their leisure activity. Here the difference is, that the event which excites the spectator's interest and pleasure at a race or athletic contest is not a wholly unreal or simulated event; true, it is less real than life, but it is more real than art. The contest has not, indeed, any momentous practical consequences, but it is a contest in which competitors put forth real strength, and one really wins, and others are defeated. Such a contest, in which the exertions are real and the issue uncertain, we follow with an excitement and an expectancy which are different in kind from the feelings with which we contemplate any fictitious representation of which the issues are arranged beforehand. For example, let the reader recall the feelings with which he has watched a real fencing bout, and compare them with those with which he watches the simulated fencing bout in Hamlet. The instance is a crucial one, because the simulated contest is made infinitely more exciting than such contests in general by the introduction of the poisoned foil, and by the tremendous consequences which we are aware will turn, in the representation, on the issue. Yet because the fencing scene in Hamlet *is* a representation, and not real, we find ourselves watching it in a mood wholly different from that in which we watch the most ordinary real fencing-match with vizors and blunt foils; a mood much more exalted, if the representation is good, but amid the æsthetic emotions of which those other fluctuations of direct, even if trivial, excitement, of participation, approval, disappointment, suspense, eagerness, find no place. Again, of athletics in general, they are pursuits to a considerable degree definitely utilitarian, having for their specific end the training and strengthening of the human body. Here, however, our argument touches ground which is not free from debate; inasmuch as in some systems the title of fine arts has been consistently claimed, if not for athletics technically so-called, and involving the idea of competition and defeat, at any rate for gymnastics, regarded simply as a display of the physical frame of man cultivated by exercise—as, for instance, it was cultivated by the ancient Greeks—to an ideal perfection of beauty and strength.

General definition.

Divesting the view of Schiller, then of the Kantian metaphysic, and adding to it those provisions on which, in the course of our argument, we have seen the necessity of laying stress, we might put the matter thus. There are some things which we do because we must; those are our necessities. There are other things which we do because we ought; those are our duties. There are other things which we do because we like; those are our play. *Among the various kinds of things done by men only because they like, the fine arts are those of which the results afford to many permanent and disinterested delight, and of which the performance, calling for premeditated skill, is capable of regulation up to a certain point, but, that point passed, has secrets beyond the reach and a freedom beyond the restraint of rules.* We believe that this definition or description, avoiding barren controversy concerning the nature of beauty, will be found both to state the limits of the group of undisputed fine arts, and to enunciate some of its chief characteristics.

II. Of the Fine Arts severally.

Architecture, sculpture, painting, music, and poetry are by common consent the five principal or greater fine arts.

Modes in which the five greater arts have been classified.

It is possible in thought to group these five arts in as many different orders as there are among them different kinds of relation or affinity. One thinker fixes his attention upon one kind of relations as the most important, and arranges his group accordingly; another upon another; and each, when he has done so, is very prone to claim for his arrangement the virtue of being the sole essentially and fundamentally true. For example, we may ascertain one kind of relations between the arts by inquiring which is the simplest or most limited in its effects, which next simplest, which less simple still, which least simple or most complex of them all. This, the relation of progressive complexity or comprehensiveness between the fine arts, is the relation upon which an influential thinker of recent times, Auguste Comte, has fixed his attention, and it yields in his judgment the following order:—Architecture lowest in complexity, both because of the kinds of effects which it produces, and the material conditions and limitations under which it works; sculpture next; painting third; then music; and poetry highest, as the most complex or comprehensive art of all, both in its own special effects and in its resources for ideally calling up the effects of all the other arts, as well as all the phenomena of nature and experiences of life. A somewhat similar grouping was adopted, though from the consideration of a wholly different set of relations, by Hegel. Hegel fixed his attention on the varying relations borne by the idea, or spiritual element, to the embodiment of the idea, or material element, in each art. Leaving aside that part of his doctrine which concerns, not the phenomena of the arts themselves, but their place in the dialectical world-plan, or scheme of the universe—Hegel said in effect something like this. In certain ages and among certain races, as in Egypt and Assyria, and again in the Gothic age of Europe, mankind has only dim ideas for art to express, ideas insufficiently disengaged and realized, of which the expression cannot be complete or lucid, but only adumbrated and imperfect; the characteristic art of those ages is a symbolic art, with its material element predominating over and keeping down its spiritual, and such a symbolic art is architecture. In other ages, as in the Greek age, the ideas of men have come to be definite, disengaged, and clear; the characteristic art of such an age will be one in which the spiritual and material elements are in equilibrium, and neither predominates over or keeps down the other, but a perfectly distinct idea is expressed in a perfectly adequate form; this is the mode of expression called classic, and the classic art is sculpture. In other ages, again, and such are the modern ages of Europe, the idea grows in power and becomes importunate; the spiritual and material elements are no longer in equilibrium, but the spiritual element predominates; the characteristic arts of such an age will be those in which thought, passion, sentiment, aspiration, emotion, emerge in freedom, dealing with material form as masters, or declining its shackles altogether; this is the romantic mode of expression, and the romantic arts are painting, music, and poetry. Next let us take another point of view, and turn our attention, with one of the acutest of recent critics of æsthetic systems, Dr. Hermann Lotze, to the relative degrees of freedom or independence which the several arts enjoy—their freedom, that is, from the necessity of either imitating given facts of nature or ministering, as part of their task, to given practical uses. In this grouping, instead of the order architecture, sculpture, painting, music, poetry—music will come first, because it has neither to imitate any natural facts nor to serve any practical end; architecture next, because though it is tied to useful ends and material conditions, yet it is free from the task of imitation, and pleases the eye in its degree, by pure form, light and shade, and the rest, as music pleases the ear by pure sound; then, as arts all tied to the task of imitation, sculpture, painting, and poetry, taken in progressive order according to the progressing comprehensiveness of their several resources.

Place of the lesser or auxiliary arts among the rest.

Again, besides the enumeration of the five greater fine arts, which is fixed, and their classification, which is thus unfixed and variable, the thinker on these subjects has to consider the enumeration and classification of the lesser or subordinate fine arts. Whole clusters or families of these occur to the mind at once; such as acting, an art auxiliary to poetry, but quite different in kind; dancing, an art not auxiliary but subordinate to music, from which in kind it differs no less; eloquence in all kinds, so far as it is studied and not merely spontaneous; and among the arts which fashion or dispose material objects, embroidery and the weaving of patterns, pottery, glassmaking, goldsmith's work, and jewelry, joiner's work, gardening, according to the claim of some, and a score of other dexterities and industries which are more than mere dexterities and industries because they add elements of beauty and pleasure to elements of serviceableness and use. To decide whether any given one of these has a right to the title of fine art, and if so, to which of the greater fine arts it should be thought of as appended and subordinate, or between which two of them intermediate, is often no easy task.

No one classification sufficient.

The weak point of all classifications of the kind of which we have above given examples is that each is intended to be final, and to serve instead of any other. The truth is, that the relations between the several fine arts are much too complex for any single classification to bear this character. Every classification of the fine arts must necessarily be provisional, according to the particular class of relations which it keeps in view. And for practical purposes it is requisite to bear in mind not one classification but several. Fixing our attention not upon complicated or problematical relations between the various arts, but only upon their simple and undisputed relations, and giving the first place in our consideration to the five greater arts of architecture, sculpture, painting, music, and poetry, we shall find at least three principal modes in which every fine art either resembles or differs from the rest.

First classification—the shaping and speaking arts.

1. *The Shaping and the Speaking Arts.*—Each art either makes something, or does not make anything, that can be seen and handled. The arts which make something that can be seen and handled are architecture, sculpture, and painting. In the products or results of all these arts external matter is in some way or another manually put together, fashioned, or disposed. But music and poetry do not produce any results of this kind. What music produces is something that can be heard, and what poetry produces is something that can be either heard or read—which last is a kind of ideal hearing, having for its avenue the eye instead of the ear, and for its material, written signs for words instead of the spoken words themselves. Now what the eye sees from any one point of view, it sees all at once; in other words, the parts of anything we see fill or occupy not time but space, and reach us from various points in space at a single simultaneous perception. If we are at the proper distance we see at one glance the whole height and breadth of a house from the ground to the chimneys, the whole of a statue from head to foot, and in a picture at once the foreground and background, and everything that is within the four corners of the frame. On the other hand, the parts of anything we hear, or, reading, can imagine that we hear, fill or occupy not space but time, and reach us from various points in time through a continuous series of perceptions, or, in the case of reading, of images raised by words in the mind. We have to wait, in music, while one note follows another in a bar, and one bar another in an air, and one air another in a movement; and in poetry, while one line with its images follows another in a stanza, and one stanza another in a canto, and so on. It is a convenient form of expressing both aspects of this difference between the two groups of arts, to say that architecture, sculpture, and painting are arts which give shape to things in space, or more briefly, shaping arts; and music and poetry arts which give utterance to things in time, or more briefly, speaking arts. These simple terms of the *shaping* and the *speaking* arts are not usual in English; but they seem appropriate and clear, and we shall adopt them for denoting the distinction we are now considering between the group that work in space, architecture, sculpture, and painting, and the group that work in time, music and poetry. (The distinction is best expressed in the German *bildende* and *redende Künste;* for which the words *manual* and *vocal,* or else *formative,* or *plastic,* and *rhetorical,* are sometimes used, not too happily, in English.) This is practically, if not logically, the most substantial and vital distinction upon which a classification of the fine arts can be based. The arts which surround us in space with stationary effects for the eye, as the house we live in, the picture on the walls, the marble figure in the vestibule, are stationary, hold a different kind of place in our experience—not a greater or a higher place, but essentially a different place—from the arts which provide us with transitory effects in time, effects capable of being awakened for the ear or mind at any moment, as a symphony is awakened by playing and an ode by reading, but lying in abeyance until we bid that moment come, and passing away when the performance or the reading is over. Such, indeed, is the practical force of the distinction that in modern usage the expression *fine art,* or even *art,* is often used by itself in a sense which tacitly excludes music and poetry, and signifies the group of manual or shaping arts alone.

Intermediate class of arts of motion.

As between any two of the five greater arts, the distinction on which we are now dwelling is sharp and absolute. Buildings, statues, pictures, belong absolutely to sight and space; to time and to hearing, real through the ear, or ideal through the mind in reading, belong absolutely music and poetry. Among the lesser or subordinate arts, however, there are several in which this distinction finds no place, and which produce, in space and time at once, effects midway between the stationary or stable, and the transitory or fleeting. Such, first of all, is the dramatic art, in which the actor makes with his actions and gestures, or several actors make with the combination of their different actions and gestures, a kind of shifting picture, which appeals to the eyes of the witnesses while the sung or spoken words of the drama appeal to their ears; thus making of them spectators and auditors at once, and associating with the pure time-art of words the mixed time-and-space art of bodily movements. As all *movement* whatsoever is necessarily movement through space, and takes time to happen, so every other fine art which is wholly or in part an art of movement partakes in like manner of this double character. Along with acting thus comes dancing. Dancing, when it is of the mimic character, may itself be a kind of acting, and is, whether apart from or in conjunction with this mimic element, at any rate an art in which bodily movements obey, accompany, and as it were accentuate in space the time effects of music. Eloquence or oratory in like manner, so far as its power depends on studied and premeditated gesture, is also an art which to some extent enforces its primary appeal through the ear in time by a secondary appeal through the eye in space. So much for the first distinction, that between the shaping or space-arts and the speaking or time-arts, with the intermediate and subordinate class of arts which, like acting, dancing, oratory, add to the pure time element a mixed time-and-space element. These can hardly be called shaping arts, because it is his own person, and not anything outside himself, which the actor, the dancer, the orator disposes or adjusts; they may perhaps best be called arts of motion, or moving arts. We must postpone further description of the functions of the several fine arts until we have taken account of the second great principle of classification among them, which is as follows:—

Second classification—the imitative and non-imitative arts.

2. *The Imitative and the Non-imitative Arts.*—Each art either represents or imitates something, or does not represent or imitate anything, which exists already in nature. Of the five greater fine arts, those which thus represent objects existing in nature, are sculpture, painting, and poetry. Those which do not represent anything so existing are music and architecture. So that on this principle we get a different grouping from that which we got on the principle last explained. Two space-arts and one time-art now form the imitative group of sculpture, painting, and poetry; while one space-art and one time-art form the non-imitative group of music and architecture. The mixed space-and-time arts of the actor, and of the dancer so far as he or she is also a mimic, belong of course, by their very name and nature, to the imitative class.

The imitative functions of the arts according to Aristotle.

It was this imitative character of the arts which chiefly occupied the attention of Aristotle. But Aristotle had not realized that there existed, along with the great group of imitative arts, another group strictly non-imitative. In his mind the idea of imitation or representation (mimêsis) was extended so as to denote the expressing, uttering, or making manifest of anything whatever. Music and dancing, by which utterance or expression is given to emotions that may be quite detached from all definite ideas or images, are thus for him varieties of imitation. He says, indeed, *most* music and dancing, as if he was aware that there were exceptions, but he does not indicate what the exceptions are; and under the head of imitative music, he distinctly reckons some kinds of instrumental music without words. But in our own more precise usage, to imitate is necessarily to imitate some individual thing, some definite reality of experience; and we can only call those imitative arts which tell us of such things, either by showing us their actual likeness, as sculpture does in solid form, and as painting does by means of lines and colors on a plane surface, or else by calling up ideas or images of them in the mind, as poetry and literature do by means of words. It is by a stretch of ordinary usage that we apply the word imitation even to this last way of representing things; since words are no true likeness of, but only arbitrary signs for, the thing they represent. And those arts we cannot call imitative at all which by indefinite utterance or expression produce in us emotions unattended by the recognizable likeness, idea, or image of anything.

Non-imitative character of music.

Now the emotions of music, when music goes along with words, whether in the shape of actual song, or even of the instrumental accompaniment of song, are no doubt in a certain sense attended with definite ideas. But the ideas then in question are the ideas expressed by the words themselves; and the same ideas would be conveyed to the mind equally well by the same words if they were not sung or accompanied, but simply spoken. What the music contributes is a special element of its own, an element of pure emotion which heightens the effect of the words upon the feelings, without in the least helping to elucidate them for the understanding. Nay, it is well known that a song produces its intended effect upon the feelings almost as well though we fail to catch the words or are ignorant of the language to which they belong. Thus the view of Aristotle cannot be defended on the ground that he was familiar with music only in an elementary form, and principally as the direct accompaniment of words, and that in his day the modern development of the art, as an art for building up immense constructions of independent sound, glorious and intricate fabrics of melody and harmony detached from words, was a thing neither imagined nor imaginable. That is perfectly true; but the essential character of musical sound is the same in its most elementary as in its most complicated stage. Its privilege is to give delight, not by communicating definite ideas, or calling up particular images, but by expressing on the one part, and arousing on the other, a unique kind of emotion. The emotion caused by music may be altogether independent of any ideas conveyable by words. Or it may serve to intensify and enforce other emotions arising at the same time in connection with the ideas conveyed by words; and a distinguished composer and energetic musical reformer of our own day insists that in the former phase the art is now exhausted, and that only in the latter are new conquests in store for it. But in either case the music is the music, and *is like nothing else;* it is no representation or similitude of anything whatsoever.

Objections to the above; and the reply.

But does not instrumental music really, it may be urged, sometimes imitate the sounds of nature, as the piping of birds, the whispering of woods, the moaning of storms, or very explosion of the thunder; or does it not at any rate suggest these things by resemblances so close that they almost amount to imitation? Occasionally, it is true, music does allow itself these playful excursions into a region of quasi-imitation or mimicry. It modifies the character of its abstract sounds into something, so to speak, more concrete, and, instead of sensations which are like nothing else, affords us sensations which recognizably resemble those we receive from some of the sounds of nature. But such excursions are hazardous, and to make them often is the surest proof of vulgarity in a musician. Neither are those effects of the great composers in accompanying the verbal descriptions of natural phenomena, which we recognize as most appropriate to the phenomena described, generally in the nature of real imitations or representations of them. The notes of the dove and nightingale in Haydn's *Creation* must be acknowledged to be instances of true though highly idealized imitation; but in such other instances of direct, obvious, and suggestive appropriateness of the music to the words as even the "Hailstone" chorus and the "Darkness" chorus of the *Israel in Egypt*, the music in no true sense imitates the phenomena, or *shows us how* fire mingled with the hail ran along upon the ground, or how there came over all the land of Egypt thick darkness—even a darkness which might be felt. Again, it is an acknowledged fact concerning the operation of instrumental music on its hearers, that all hearers will find themselves in tolerable agreement as to the meaning of any passage so long as they only attempt to describe it in terms of vague emotion, and to say, such and such a passage expresses, as the case may be, dejection or triumph, effort or the relaxation of effort, eagerness or languor, suspense or fruition, anguish or glee. But their agreement comes to an end the moment they begin to associate, in their interpretation, definite ideas with these vague emotions; then we find that what suggests in idea to one hearer the vicissitudes of war will suggest to another, or to the same at another time, the vicissitudes of love, to another those of spiritual yearning and aspiration, to another, it may be, those of changeful travel by forest, champaign, and ocean, to another those of life's practical struggle and ambition. The infinite variety of the ideas which may thus be called up in different minds by the same strain of music is proof enough that the music is not like any particular thing. The torrent of entrancing emotion which it pours along the heart, emotion latent and undivined until the spell of sound begins, that is music's achievement and its secret; the ideas which may spring up in attendance on the emotion are no more than as the rainbow colors which come and go in the torrent spray.

It is perhaps hardly necessary to add, that the latest physiological explanation of the source of music's power within us in no way shakes or interferes with this fundamental character of the art. According to that explanation, the charm of musical sounds depends on susceptibilities which have gone on accumulating in the fibres of the human constitution, by hereditary transmission through uncounted generations, ever since our brute progenitors found favor with their mates by wooing them (as other brutes are known to woo theirs now) with love-cries which in their regulated time and pitch contained the rudimentary elements of music. If this explanation is true, that does not of course mean that the musical utterance of to-day is any copy or imitation of those aboriginal love-cries; only that it is an infinitely complex and remote development of faculties which had in them their earliest exercise.

Definition of music.

Aristotle endeavored to frame a classification of the arts, in their several applications and developments, on two grounds—the nature of the objects imitated by each, and the means or instruments employed in the imitation. But in the case of music the first part of this endeavor falls to the ground, because the object imitated has, in truth, no existence. The means employed by music are successions and combinations of vocal or instrumental sounds regulated according to the three conditions of time or interval, tone or pitch (which together make up melody), and harmony, or the relations of different strains of time and tone co-operant but not parallel. With these means, music either creates her independent constructions, or else accompanies, adorns, enforces, the imitative art of speech—but herself imitates not; and may best be defined simply as *a speaking art, of which the business is to utter and arouse emotion by successions and combinations of regulated sound.*

Non-imitative character of architecture. Analogies of architecture and music.

That which music is thus among the speaking or time-arts, architecture is among the shaping or space-arts. As music appeals to our faculties for taking pleasure in non-imitative combinations of transitory sound, so architecture appeals to our faculties for taking pleasure in non-imitative combinations of stationary mass. Corresponding to the system of ear-effects or combinations of time, tone, and harmony with which music works, architecture works with a system of eye-effects or combinations of line, light and shade, color, proportion, interval, alternation of plane and decorated parts, regularity and variety in regularity, apparent stability, vastness, appropriateness, and the rest. Such pleasures of the eye and ear, depending on abstract relations of sounds in time and sights in space, and not all on concrete imitation, are one half of those disinterested pleasures of which we are capable, and which the play impulse within us finds out and turns to account. Only, the materials of architecture are not volatile and intangible like sound, but solid brick, stone, metal, and mortar, and the laws of weight and force according to which these materials have to be combined are much more severe and cramping than the laws of melody and harmony which regulate the combinations of music. The architect is further subject up to a certain point, which the musician is not, to the dictates and precise prescriptions of utility. Hence the effects of architecture are necessarily less full of various, rapturous, and unforeseen enchantment than the effects of music. Yet for those who possess sensibility (which many persons without knowing it completely lack) to the pleasures of the eye and the perfections of shaping art, the architecture of the great ages has yielded combinations which, so far as comparison is permissible between things unlike in their materials, fall no whit short of the achievements of music in those kinds of excellence which are common to them both. Thus in the virtues of lucidity, of just proportion and organic interdependence of the several parts or members, in exquisite subtlety of their mutual relations, and of the transitions from one part or member to another, in consummate purity and consummate finish of individual forms, in the character of one thing growing naturally out of another and everything serving to complete the whole—in all these qualities, no musical combination can surpass a typical Doric temple such as the Hecatompedon at Athens. None, again, can surpass the great cathedrals of the Middle Age in the qualities of sublimity, of complexity, in the power both of expressing and suggesting spiritual aspiration, in the invention of intricate developments and ramifications about a central plan, in the union of greatness and majesty in the main conception with inexhaustible fertility of adornment in detail. In fancifulness, in the unexpected, in capricious opulence and far-sought splendor, in filling the mind with mingled enchantments of East and West and South and North, none can surpass a building like St. Mark's at Venice, with its blending of Byzantine elements, Italian elements, Gothic elements, each carried to the utmost pitch of elaboration and each enriched with a hundred caprices of ornament, but all working together, all in obedience to a law, and "all beginning and ending with the Cross." It would be tempting to carry further, and into more particular applications, the parallel between the space-effects of architecture and the time-effects of music. But we must be content with having indicated it here. It is no fanciful similitude, but constitutes, so to speak, the positive aspect of that affinity between music and architecture, of which we bring forward the negative aspect only when we separate these two arts, as being non-imitative, from the imitative arts of sculpture, painting, and poetry.

Exceptions and limitations to the above.

In the case of architecture, however, as in the case of music, this non-imitative character must not be stated quite without exception or reserve. There have been styles of architecture in which forms suggesting or imitating natural or other phenomena have held a place among the abstract forms proper to the art. Often the mode of such suggestions is rather symbolical to the mind than really imitative to the eye; as when the number and relations of the heavenly planets were imaged in the seven concentric walls of their great temple, and in many other architectural constructions, by that race of astronomers the Babylonians; or as when the shape of the cross was adopted, with innumerable slight varieties and modifications, for the ground plan of the churches of Christendom. Passing to examples of imitation more properly so called, it may be true, and was at any rate long believed, that the aisles of Gothic churches had reference to or were inspired by the aspect of the natural forest aisles amid which they rose, and that the upsoaring forest trunks and meeting branches were imaged in their piers and vaultings. In the temple-palaces of Egypt, one of the regular architectural members, the sustaining pier, is often systematically wrought in the actual likeness of a conventionalized cluster of lotus stems, with lotus flowers for the capitals. When we come to the fashion, not rare in Greek architecture, of carving this same sustaining member, the column, in complete human likeness, and employing Caryatids, Canephori, Atlases, or the like, to carry the architrave of a building, it then becomes difficult to say whether we have to do with the work of architecture or of sculpture. The case, at any rate, is different from that in which the sculptor is called in to supply surface decoration to the various members of a building, or to fill with the products of his own art spaces in the building specially contrived and left vacant for that purpose. When the imitative feature is in itself an indispensable member of the architectural construction, to architecture rather than sculpture (not that such niceties of appropriation are important) we shall probably do best to assign it.

Definition of architecture.

Defining architecture, then (apart from its utility, which for the present we leave out of consideration), as *a shaping art, of which the function is to arouse emotion by combinations of ordered and decorated mass,* we pass from the characteristics of the non-imitative to those of the imitative group of arts.

The imitative arts.

The second half of the disinterested pleasures of which we are capable, and which the play impulse finds out and turns to account in us, are the pleasures afforded by imitation, that is, by the showing of shows or the telling of stories which bring before us things like what we know in reality. In the consideration of the arts which minister to these pleasures, we cannot do better than follow that Aristotelian division to which we have already alluded, and which describes each art according, first, to the objects it imitates, and secondly, to the means or instruments it employs.

Sculpture and its varieties.

Sculpture, then, may have for its objects of imitation the shapes of whatever things possess length, breadth, and magnitude. For its means or instruments it has solid form, which the sculptor either carves out of a hard substance, as in the case of wood and stone, or models in a yielding substance, as in the case of clay and wax, or casts in a dissolved or molten substance, as in the case of plaster and of metal in certain uses, or beats, draws, or chases in a malleable and ductile substance, as in the case of metal in other uses, or stamps from dies or moulds, a method sometimes used in all soft or fusible materials. Thus a statue or statuette may either be carved straight out of a block of stone or wood, or first modelled in clay or wax, then moulded in plaster or some equivalent material, and then carved in stone or cast in bronze. A gem is wrought in stone by cutting and grinding. Figures in jeweller's work are wrought by beating and chasing; a medallion by beating and chasing or else by stamping from a die; a coin by stamping from a die; and so forth. The process of modelling (Greek πλάττειν) in a soft substance being regarded as the typical process of the sculptor, the name *plastic art* has been given to his operations in general.

Sculpture in the round and in relief.

In general terms, the task of sculpture is to imitate solid form with solid form. But sculptured form may be either completely or incompletely solid. Sculpture in completely solid form exactly reproduces, whether on the original or on a different scale, the relations or proportions of the object imitated in the three dimensions of length, breadth, and depth or thickness. Sculpture in incompletely solid form reproduces the proportions of the objects with exactness only so far as concerns two of its dimensions, namely those of length and breadth; while the third dimension, that of depth or thickness, it reproduces in a diminished proportion, leaving it to the eye to infer, from the partial degree of projection given to the work, the full projection of the object imitated. The former, or completely solid kind of sculpture, is called sculpture in the round; its works stand free, and can be walked round and seen from all points. The latter, or incompletely solid kind of sculpture, is called sculpture in relief; its works do not stand free, but are engaged in or attached to a background, and can only be seen from in front. According, in the latter kind of sculpture, to its degree of projection from the background, a work is said to be in high or in low relief. Sculpture in the round and sculpture in relief are alike in this, that the properties of objects which they imitate are their outlines, or the boundaries and circumscriptions of their masses, and their light and shade—the lights and shadows, that is, which diversify the curved surfaces of the masses in consequence of their alternations and gradations of projection and recession. But the two kinds of sculpture differ in this. A work of sculpture in the round imitates the whole of the outlines of any given object, and presents to the eye, as the object itself would do, a new outline succeeding the last every moment as you walk round it. Whereas a work of sculpture in relief imitates only one outline of any object; it takes, so to speak, a section of the object as seen from a particular point, and traces on the background the boundary-line of that particular section; merely suggesting, by modelling the surface within such boundary according to a regular, but a diminished, ratio of projection, the other outlines which the object would present if seen from all sides successively.

Subjects proper for sculpture in the round.

As sculpture in the round reproduces the real relations of a solid object in space, it follows, that the only kind of object which it can reproduce with pleasurable effect must be one not too vast or complicated, one that can afford to be detached and isolated from its surroundings, and of which all the parts can easily be perceived and apprehended in their organic relations. Further, it will need to be an object interesting enough to mankind in general to make them take delight in seeing it reproduced with all its parts in complete imitation. And again, it must be such that some considerable part of the interest lies in those particular properties of outline and light and shade which it is the special function of sculpture to reproduce. Thus a sculptured representation in the round, say, of a mountain with cities on it, would hardly be a sculpture at all; it could only be a model, and as a model might have value; but value as a work of fine art it could not have, because the object imitated would lack organic definiteness and completeness; it would lack universality of interest, and of the interest which it did possess, a very inconsiderable part indeed would depend upon its properties of outline and light and shade. Obviously there is no kind of object in the world that so well unites the required conditions for pleasurable imitation in sculpture as the human body. It is at once the most complete of organisms, and the shape of all others the most subtle as well as the most intelligible in its outlines; the most habitually detached in active or stationary freedom; the most interesting to mankind, because its own; the richest in those particular effects, contours and modulations, contrasts, harmonies, and transitions of modelled surface and circumscribing line, which it is the prerogative of sculpture to imitate. Accordingly the object of imitation for this art is pre-eminently the body of man or woman. That it has not been for the sake of representing men and women as such, but for the sake of representing gods in the likeness of men and women, that the human form has been most enthusiastically studied, does not affect this fact in the theory of the art, though it is a consideration of great importance in its history. Besides the human form, sculpture may imitate the forms of those of the lower animals whose physical endowments have something of a kindred perfection, with other natural or artificial objects as may be needed merely by way of accessory or symbol. The body must for the purposes of this art be divested of covering, or covered only with such tissues as reveal, translate, or play about without concealing it. Only in lands and ages where climate and social use have given the sculptor the opportunity of studying human forms so draped or undraped has this art attained perfection, or become exemplary and enviable to that of other races.

Subjects proper for sculpture in relief.

Relief sculpture is more closely connected with architecture than the other kind, and indeed is commonly used in subordination to it. But if its task is thus somewhat different from that of sculpture in the round, its principal objects of imitation are the same. The human body remains the principal theme of the sculptor in relief; but the nature of his art allows, and sometimes compels, him to include other objects in the range of his imitation. As he has not to represent the real depth or projection of things, but only to suggest them according to a ratio which he may fix himself, so he can introduce into the third or depth dimension, thus arbitrarily reduced, a multitude of objects for which the sculptor in the round, having to observe the real ratio of the three dimensions, has no room. He can place one figure in slightly raised outline emerging from behind the more fully raised outline of another, and by the same system can add to his representation rocks, trees, nay mountains and cities, and birds on the wing.

Relief sculpture tends to merge into drawing on the one hand and architecture on the other.

But the more he uses this liberty, the less will he be truly a sculptor. Solid modelling, and real light and shade, are the special means or instruments of effect which the sculptor alone among imitative artists enjoys. Single outlines and contours, the choice of one particular section and the tracing of its circumscription, are means which the sculptor enjoys in common with the painter or draughtsman. And indeed, when we consider works executed wholly or in part in very low relief, whether Assyrian battle-pieces and hunting-pieces in alabaster or bronze, or the backgrounds carved in bronze, marble, or wood by the Italian sculptors who followed the example set by Ghiberti at the Renaissance, we shall see that the principle of such work is not the principle of sculpture at all. Its effect depends not at all on qualities of surface-light and shadow, but exclusively on qualities of contour, as traced by a slight line of shadow on the side away from the light, and a slight line of light on the side next to it. And we may fairly hesitate whether we shall rank the artist who works on this principle, which is properly a *graphic* rather than a *plastic* principle, among sculptors or among draughtsmen. The above are cases in which the relief sculptor exercises his liberty in the introduction of other objects besides human figures into his sculptured compositions. But there is another kind of relief sculpture in which the artist has less choice. That is the kind in which the sculptor is called in to decorate with carved work parts of an architectural construction which are not adapted for the introduction of figure subjects, or for their introduction only as features in a scheme of ornament that comprises many other elements. To this head belongs most of the carving of capitals, mouldings, friezes (except the friezes of Greek temples), bands, cornices, and in the Gothic style, of doorway arches, niches, canopies, pinnacles, brackets, spandrils, and the thousand members and parts of members which that style so exquisitely adorned with true or conventionalized imitations of natural forms. This is no doubt a subordinate function of the art; and it is impossible, as we have seen already, to find a precise line of demarcation between carving, in this decorative use, which is properly sculpture, and that which belongs properly to architecture.

Definition of sculpture.

Leaving such discussions, we may content ourselves with the definition of sculpture as *a shaping art, of which the business is to imitate natural objects, and principally the human body, by reproducing in solid form either their true proportions in all dimensions, or else their true proportions in the two dimensions of length and breadth only, with a diminished proportion in the third dimension of depth or thickness.*

Nature and methods of painting.

In considering bas-relief as a form of sculpture, we have found ourselves approaching the confines of the second of the shaping-imitative arts, the graphic art, or art of painting. Painting, as to its means or instruments of imitation, dispenses with the third dimension altogether. It imitates natural objects by representing them as they are represented on the retina of the eye itself, simply as an assemblage of lines and colors on a flat surface. The character and disposition of the lines and colors in painting are determined by two things, the local colors of the objects themselves, and their shapes and positions in space. Painting does not reproduce the third dimension of reality by any third dimension of its own whatever; but leaves the eye to infer the solidity, the recession and projection, the nearness and remoteness of objects, by the same perspective signs by which it also infers those facts in nature—namely, by the direction of their several boundary lines, the incidence and distribution of their lights and shadows, the strength or faintness of their tones of color. Hence this art has an infinitely greater range and freedom than any form of sculpture. Near and far is all the same to it, and whatever comes into the field of vision can come also into the field of a picture; trees as well as personages, and clouds as well as trees, and stars as well as clouds; and on earth the remotest mountain snows as well as the violet of the foreground, and far-off multitudes of people as well as one or two near the eye. Whatever any man has seen, or can imagine himself as seeing, that he can also fix by painting, subject only to one great limitation,—that of the range of brightness which he is able to attain in imitating natural color illuminated by light. In this particular his art can but correspond according to a greatly diminished ratio with the effects of nature. But excepting this, it can do for the eye almost all that nature herself does; or at least all that nature would do if man had only one eye; since the three dimensions of space produce upon our binocular machinery of vision a particular stereoscopic effect of which a picture, with its two dimensions only, is incapable. The range of the art being thus almost unbounded, its selections have naturally been dictated by the varying interest felt in this or that subject of representation by the societies among whom the art has at various times been practised. As in sculpture, so in painting, man, whether as figuring God, or for the sake of his own looks and doings, has always held the first place. For the painter, the intervention of costume between man and his environment is not a misfortune in the same degree as it is for the sculptor. For him, clothes of whatever fashion or density have their own charm; they serve to diversify the aspect of the world, and to express the characters and stations, if not the physical frames, of his personages; and he is as happy or happier among the brocades of Venice as among the bare limbs of the Spartan palæstra. Along with man, there come into painting all animals and vegetation, all man's furniture and belongings, his dwelling-places, fields and landscape; and in modern times also landscape and nature for their own sakes, skies, seas, mountains, and wildernesses apart from man.

Three modes of imitating nature in painting.

Besides the two questions about any art, what objects does it imitate, and by the use of what means or instruments, Aristotle proposes (in the case of poetry) the further question, which of several possible forms does the imitation in any given case assume? We may transfer very nearly the same inquiry to painting, and may ask, concerning any painter, according to which of three possible systems he works. The three possible systems are (1) that which attends principally to the configuration and relations of natural objects as indicated by their circumscribing lines—this may be called for short the system of line; (2) that which attends chiefly to their configuration and relations, as indicated by the incidence and distribution of their lights and shadows—this may be called the system of light-and-shade; and (3) that which attends chiefly, not to their configuration at all, but to the distribution, qualities, and relations of colors upon their surface—this is the system of color. Line, light-and-shade, and color, these three kinds of appearances between them make up the whole world of sight. (We do not pause to insist on the fact that line is in truth partly an invention of the mind; those divisions between objects which the painter or draughtsman indicates with an outline or dark marking being in nature only indicated by the even edge where one color ends and another begins.) It is not possible for a painter to imitate natural objects to the eye at all without either defining their masses by outlines, or suggesting them by juxtapositions of light and dark or of local colors. In the complete art of painting, of course, all three methods are employed at once. But in what is known as outline drawing and outline engraving, one of the three methods only is employed, line; in *grisaille* pictures, and in shaded drawings and engravings, two only, line with light-and-shade; and in the shadowless pictures of the early religious schools, a different two only, line with color. And even in the most accomplished examples of the complete art of painting, as has been justly pointed out by Professor Ruskin, we find that there almost always prevails a predilection for some one of these three parts of painting over the other two. Thus among the mature Italians of the Renaissance, Titian is above all things a painter in color, Michelangelo in line, and Leonardo in light-and-shade.

Completeness not the test of value in a pictorial imitation.

The value of a pictorial imitation is by no means necessarily in proportion to its completeness. Many accomplished pictures, in which all the resources of line, color, and light-and-shade have been used to the uttermost of the artist's power for the imitation of all that he could see in nature, are worthless in comparison with a few faintly-touched outlines or lightly-laid shadows or tints of another artist who could see nature better. The fine art of painting addresses not merely the eye but the imagination. Unless the painter knows how to choose and combine the elements of his finished work so that it shall contain in every part suggestions and delights over and above the mere imitation, it will fall short, in that which is the essential charm of fine art, not only of any scrap of a great master's handiwork, such as an outline sketch of a child by Raphael, or a color sketch of a boat or a mackerel by Turner, but even of any scrap of the merest journeyman's handiwork produced by an artistic race, such as the first Japanese drawing for children in which a water-flag and king-fisher, or a spray of peach or almond blossom across the sky, is dashed in with a mere hint of color, but a hint that tells a whole tale to the imagination. This, however, is an order of considerations belonging rather to particular criticism than to general classification.

Technical varieties of painting.

It remains to consider, for the purposes of our classification, what are the technical varieties of the painter's craft. Since we gave the generic name of painting to all imitation of natural objects by the assemblage of lines, colors, and lights and darks on a single plane, we must include, as varieties of painting, not only the ordinary crafts of spreading or laying pictures on an opaque surface in fresco, oil, or water-color, but also the craft of arranging a picture to be seen by the transmission of light through a transparent substance, in glass painting; the craft of fitting together a multitude of solid cubes or cylinders so that their united surface forms a picture to the eye, in mosaic; the craft of spreading vitreous colors in a state of fusion so that they form a picture when hardened, as in enamel; and even, it would seem, the crafts of tapestry and embroidery, since these also yield to the eye a plane surface figured in imitation of nature. As drawing we must also count incised or engraved work of all kinds representing merely the outlines of objects and not their modellings, as for instance the mythological subjects incised upon the bronze mirrors and dressing-cases of Etruscan ladies; while raised work in low relief, in which outlines are plainly marked and modellings neglected, furnishes, as we have seen, a doubtful class between sculpture and painting. In all figures that are first modelled in the solid and then variously colored, sculpture and painting bear a common part; as for instance when the sculptor Praxiteles handed his finished statue to the painter Nicias to receive its *circumlitio* or tinting. But as the special characteristic of sculpture, the third dimension, is here present, it is to that art and not to painting that we shall still ascribe the resulting work. The system of more or less highly coloring stone statues, that is, of *painting sculpture*, which the moderns have disused, prevailed alike in the Greek and Gothic ages; and solid form and local color have been similarly combined in the productions of pottery in all ages, from those of Corinth and Tanagra down to those of Dresden and Sèvres.

Definition of painting.

With these indications, which the reader can easily follow up for himself, we may leave the art of painting defined in general terms as a *shaping art, of which the business is to imitate all kinds of natural objects by reproducing on a plane surface the relations of their boundary lines, lights and shadows, or colors, or all three of these appearances together.*

Nature and methods of poetry.

The next and last of the imitative arts is the speaking art of poetry. The transition from sculpture and painting to poetry is, from the point of view not of our present but of our first division among the fine arts, abrupt and absolute. It is a transition from space into time, from the sphere of material forms to the sphere of immaterial images. This is not the place for any detailed exposition of the principles of poetry. But for the sake of the due co-ordination of this art in our general scheme, we are bound as briefly as we can to state its functions among the rest. In so doing we will again adopt the several heads of description with which the reader is already familiar from Aristotle. The objects of poetry's imitation, then, we shall define as everything of which the idea or image can be called up by words, that is, every force and phenomenon of nature, every operation and result of art, every fact of life and history, or every imagination of such a fact, every thought and feeling of the human spirit, for which mankind in the course of its long evolution has been able to create in speech an explicit and appropriate sign. The means or instruments of poetry's imitation are these verbal signs or words, arranged in lines, strophes, or stanzas, so that their sounds have some of the regulated qualities of music. The three chief modes or forms of the imitation may still be defined as they were defined by Aristotle himself. First comes the epic or narrative form, in which the poet speaks alternately for himself and his characters, now describing their situations and feelings in his own words, and anon making each of them speak in the first person for himself. Second comes the lyric form, in which the poet speaks in his own name exclusively, and gives expression to sentiments which are purely personal. Third comes the dramatic form, in which the poet does not speak for himself at all, but only puts into the mouths of each of his personages successively such discourse as he thinks appropriate to the part. The last of these three forms of poetry, the dramatic, calls, if it is merely read, on the imagination of the reader to fill up those circumstances of situation, action, and the rest which in the first or epic form are supplied by the narrative between the speeches, and for which in the lyric or personal form there is no occasion. To avoid making this call upon the imagination, to bring home its effects in full reality, dramatic poetry has to call in the aid of several subordinate arts, the shaping or space art of the scene-painter, the mixed time and space arts of the actor and the dancer. Occasionally also, or in the case of opera throughout, dramatic poetry heightens the emotional effect of its words with music. A play or drama is thus, as performed upon the theatre, not a poem merely, but a poem accompanied, interpreted, completed, and brought several degrees nearer to reality by a combination of auxiliary effects of the other arts. Besides the narrative, the lyric, and dramatic forms of poetry, the didactic, that is, the teaching or expository form, has usually been recognized as a fourth. Aristotle refused so to recognize it, regarding a didactic poem in the light not so much of a poem as of a treatise. But from the *Works and Days* down to the *Loves of the Plants* there has been too much literature produced in this form for us to follow Aristotle here. We shall do better to regard didactic poetry as a variety corresponding, among the speaking arts, to architecture and the other manual arts of which the first purpose is use, but which are capable of accompanying and adorning use by a pleasurable appeal to the emotions.

Definition of poetry.

We shall hardly make our definition of poetry, considered as an imitative art, too extended if we say that it is *a speaking art, of which the business is to represent by means of verbal signs arranged with musical regularity everything for which verbal signs have been invented.*

Neither the varieties of poetical form, however, nor the modes in which the several forms have been mixed up and interchanged—as such mixture and interchange are implied, for instance, by the very title of a group of Mr. Browning's poems, the *Dramatic Lyrics,*—the observation of neither of these things concerns us here so much as the observation of the relations of poetry in general, as an art of representation or imitation, to the other arts of imitation, painting and sculpture.

Analogies and contrasts between the three imitative arts.

Verbal signs have been invented for innumerable things which cannot be imitated or represented at all either in solid form or upon a colored surface. You cannot carve or paint a sigh, or the feeling which finds utterance in a sigh; you can only suggest the idea of the feeling, and that in a somewhat imperfect and uncertain way, by representing the physical aspect of a person in the act of breathing the sigh. Similarly you cannot carve or paint any movement, but only figures or groups in which the movement is represented as arrested in some particular point of time; nor any abstract idea, but only figures or groups in which the abstract idea, as for example release, captivity, mercy, is illustrated in the concrete shape of allegory. The whole field of thought, of propositions, arguments, injunctions, and exhortations, is open to poetry, but closed to sculpture and painting. Poetry, by its command over the regions of the understanding, of abstraction, of the movement and succession of things in time, by its power of instantaneously associating one delightful image with another from the remotest regions of the mind, by its names for every shade of feeling and experience, exercises a sovereignty a hundred times more extended than that of either of the two arts of manual imitation. But on the other hand, words do not as a rule bear any sensible resemblance to the things of which they are the signs. There are few things that words do not stand for or cannot call up; but they stand for things, as it were, only at second hand, and call them up only in idea, and not in actual presentment to the senses. And just in this lies the strength of painting and sculpture, that though there are countless things which they cannot represent at all, and countless more which they can only represent by suggestion more or less ambiguous, yet there are a few things which they represent more effectually and directly than poetry can represent anything at all. These are, for sculpture, the forms or configurations of things, which that art represents directly to the senses both of sight and touch; and for painting the forms or configurations, colors, and relative positions of things, which the art represents to the sense of sight, directly so far as regards surface appearances, and indirectly so far as regards solidity. For many delicate qualities and differences in these visible relations of things, there are no words at all—the vocabulary of colors, for instance, is in all languages surprisingly scanty and primitive. And those visible qualities for which words exist, the words still call up indistinctly and at second hand. Poetry is almost as powerless to bring before the mind's eye with precision a particular shade of red or blue, as sculpture is to relate a continuous experience, or painting to enforce an exhortation or embellish an abstract proposition. The wise poet, as has been justly remarked, when he wants to produce a vivid impression of the beauty of a visible thing, does not attempt to catalogue or describe its stationary beauties. In representing the perfections of form in a bride's slender foot, the speaking art, poetry, would find itself distanced by either of the shaping arts, painting or sculpture; the wise poet calls up the charm of such a foot by describing it not at rest but in motion, and in the feet which

> "Beneath the petticoat,
> Like little mice, went in and out,"

leaves us an image which baffles the power of the other arts. Shakespeare, when he wants to make us realize the perfections of Perdita, puts into the mouth of Florizel, not, as a bad poet would have done, a description of her lilies and carnations, and the other charms which a painter could make us realize better, but the praises of her ways and movements; and with the final touch—

> "When you do dance, I wish you
> A wave o' the sea, that you might ever do
> Nothing but that,"

he leaves upon the mind a twofold image of beauty in motion, of which one-half might be the despair of those painters who designed the dancing maidens of the walls of Herculaneum, and the other half the despair of all artists who in modern times have tried to fix upon their canvas the buoyancy and grace of dancing waves.

Law of their relations.

The difference between the means and capacities of representation proper to the shaping arts of sculpture and painting, and those proper to the speaking art of poetry, which we have unsystematically glanced at in the above, were for a long while overlooked or misunderstood. The maxim of Simonides, that poetry was a kind of articulate painting, and painting a kind of mute poetry, was vaguely accepted until the days of Lessing, and first overthrown by the famous treatise of that writer on the Laocoön. Following in the main the lines laid down by Lessing, other writers have worked out the conditions of representation or imitation proper, not only to sculpture and painting as distinguished from poetry, but to sculpture as distinguished from painting, until there is perhaps no part of artistic theory so well or so generally understood as this. The chief points, with some of which we have become acquainted already, may really all be condensed under the simple law, *that the more direct and complete the imitation effected by any art, the less is the range and number of phenomena which that art can imitate.* Thus sculpture in the round imitates its objects much more completely and fully than any other single art, reproducing one whole set of their relations which no other art attempts to reproduce at all, namely, their solid relations in space. Precisely for this reason, such sculpture is limited to a narrow class of objects. As we have seen, it must represent human or animal figures; nothing else has enough of organic beauty and perfection, or enough of universal interest. It must represent such figures in combinations and with accessories comparatively simple, on pain of puzzling and embarrassing the eye with a complexity and entanglement of masses and lights and shadows; and in attitudes comparatively quiet, on pain of violating, or appearing to violate, the conditions of mechanical stability. Being a stationary or space-art, it can only represent a single action, which it fixes and perpetuates for ever; and it must therefore choose for that action one as significant and full of interest as is consistent with due observation of the above laws of simplicity and stability. Such actions, and the facial expressions accompanying them, must not be those of sharp crisis or transition, because sudden movement or flitting expression, thus arrested and perpetuated in full and solid imitation by bronze or marble, would be displeasing and not pleasing to the spectator. They must be actions and expressions in some degree settled, collected, and capable of continuance, and in their collectedness must at the same time suggest to the spectator as much as possible of the circumstances which have led up to them and those which will next ensue. These conditions evidently bring within a very narrow range the phenomena with which this art can deal, and explain why, as a matter of fact, by far the greater number of statues represent simply a single figure in repose, with the addition of one or two symbolic or customary attributes. Paint the statue and you bring the imitation to a still further point of completeness by the addition of local color; but you do not thereby lighten in any degree the restrictions which are inevitably laid upon sculpture so long as it undertakes to reproduce in full the third or solid dimension of bodies. You only begin to lighten its restrictions when you begin to relieve it of that duty. We have traced how sculpture in relief, which is satisfied with only a partial reproduction of the third dimension, is free to introduce a larger range of objects, bringing forward secondary figures and accessories, indicating distant planes, indulging even in some violence and complexity of motion, since limbs attached to a background do not alarm the spectator by any idea of danger or fragility; though for the due effect of the work, and the pleasurable distinctness and diversity of its lights and shadows, such complexity must not, even in relief, be carried too far. And so by degrees we arrive at painting, in which the third dimension is dismissed altogether, and nothing is actually reproduced, in full or partially, except the effect made by the appearance of natural objects upon the retina of the eye. The consequence is that this art can range over distance and multitude, can represent complicated relations between its various figures and groups of figures, extensive backgrounds, and all those subtleties of appearance in natural things which depend upon local color and incidence of light and shade. These last phenomena of natural things are in our experience subject to change, in a sense in which the substantial or solid properties of things are not so subject. Colors, shadows, and atmospheric effects are to some extent associated with ideas of transition, mystery, and evanescence. Hence painting is able to extend its range to another kind of facts over which sculpture has no power. It can perpetuate in its imitation, without breach of its true laws, certain classes of facts which are themselves fugitive and transitory, as a smile, the glance of an eye, a gesture of horror or of passion, the waving of the young Achilles' hair "not unstirred," as the old description has it, by the wind, the toss and gathering of ocean waves, even the flashing of lightning across the sky. Still, any long or continuous series of changes, actions, or movements is quite beyond the means of this art to represent. Painting remains, in spite of its comparative width of range, tied down to the inevitable conditions of a space-art: that is to say, it has to delight the mind by a harmonious variety in its effects, but by a variety apprehended not through various points of time successively, but from various points in space at the same moment. Lastly, a really ample range is only attained by the art which does not give a full and complete reproduction of any natural fact at all, but represents or brings natural facts before the mind merely by the images which words convey. The whole world of movement, of continuity, of cause and effect, of the successions, alternations, and interaction of events, characters, and passions, of everything that takes time to happen and time to declare, is open to poetry as it is open to no other art. We speak only of those parts of poetry which may properly be called its imitative or representative parts, and not of its other parts or applications, in reasoning, in exhortation, in denunciation, and the like. As an imitative or representative art, then, poetry is subject to no limitations except those which spring from the poverty of human language, and from the fact that its means of imitation are indirect. Poetry's report of the visible properties of things is from these causes much less full, accurate, and efficient than the reproduction or delineation of the same properties by sculpture and painting. And this is the sum of the conditions concerning the respective functions of the three arts of imitation which had been overlooked, in theory at least, until the time of Lessing.

The acted drama no exception to this law.

To this law, in the form in which we have expressed it, it may perhaps be objected that the acted drama is at once the most full and complete reproduction of nature which we owe to the fine arts, and that at the same time the number of facts over which its imitation ranges is the greatest. The answer is that our law applies to the several arts only in that which we may call their pure or unmixed state. Dramatic poetry is in that state only when it is read or spoken like any other kind of verse. When it is witnessed on the stage, it is in a mixed or impure state; the art of the actor has been called in to give actual reproduction to the gestures and utterances of the personages, that of the costumier to their appearances and attire, that of the stage-decorator to their furniture and surroundings, that of the scene-painter to imitate to the eye the dwelling-places and landscapes among which they move; and only by the combination of all these subordinate arts does the drama gain its character of imitative completeness or reality.

Things unknown shadowed forth by imitation of things known.

Throughout the above account of the imitative and non-imitative groups of fine arts, we have so far followed Aristotle as to give the name of imitation to all recognizable representation whatever of realities. By realities we have meant not only phenomena as they actually or literally exist, or may have existed in the past. Imitation, as we understand it, is not tied to such strict veracity of positive delineation or report. It includes the representation of things which, though similar to things actually existing, have themselves never actually existed—the invention of phenomena, and of relations and combinations among phenomena, derived from those of actual experience, but not identical with them. Such shadowing forth of the unknown by means of the known is part of the work of that comprehensive faculty which we call the imagination. But the materials or elements with which the imaginative faculty is at liberty thus to deal are materials or elements supplied by real experience. When we find among the ruins of a Greek temple the statue of a beautiful young man at rest, or above the altar of a Christian church the painting of one transfixed with arrows, we know that the statue is intended to bring to our minds no mortal youth, but the god Hermes or Apollo, the transfixed victim no simple captive, but Sebastian the holy saint. At the same time we none the less know that the figures in either case have been studied by the artist from living models before his eyes. In like manner, in all the representations alike of sculpture, painting, and poetry, the things and persons represented may bear symbolic meanings and imaginary names and characters; they may be set in a land of dreams, and grouped in relations and circumstances upon which the sun of this world never shone—and such in truth was the purpose to which the arts were almost universally put until but the other day; but it is from real things and persons that their lineaments and characters have been taken in the first instance, in order to be attributed by the imagination to another and more exalted order of existences.

Imitation by art necessarily an idealized imitation.

The law which we have last laid down is a law defining the relations of sculpture, painting, and poetry, considered simply as arts having their foundations at any rate in reality, and drawing from the imitation of reality their indispensable elements and materials. It is a law defining the range and character of the elements or materials in nature which each art is best fitted, by its special means and resources, to imitate. But we must remember that, even in this fundamental part of its operations, none of these arts proceeds by imitation pure and simple. None of them contents itself with seeking to represent realities, however literally taken, exactly as those realities are. A portrait in sculpture or painting, a landscape in painting, a passage of local description in poetry, may be representations of known things taken literally or for their own sakes, and not for the sake of carrying our thoughts to the unknown; but none of them ought to be, or indeed can possibly be, a representation of all the observed parts and details of such a reality on equal terms and without omissions. Such a representation, were it possible, would be a mechanical inventory and not a work of fine art. That only, we know, is fine art which affords keen and permanent delight to contemplation. Such delight the artist can never communicate by the display of a callous and pedantic impartiality in presence of the facts of life and nature. His delineation or report of realities will only strike or impress others in so far as it directs their attention to things by which he has been struck and impressed himself. To excite emotion, he must have felt emotion; and emotion is only another word for partiality. The constitution which observes and registers every detail of an experience with uniform and equal minuteness is a constitution which has been strongly affected by no part of that experience. Such a constitution will never make an artist. The ulterior imaginative meanings and combinations of art being left out of the question, the artist is one who instinctively tends to modify and work upon every reality before him in conformity with some poignant and sensitive principle of preference or selection in his mind. He instinctively adds something to nature in one direction and takes away something in another, overlooking this kind of fact and insisting on that, suppressing many particulars which he holds irrelevant in order to insist on and bring into prominence others by which he is attracted and arrested. To do this is called to idealize, and the faculty by which an artist prefers, selects, and brings into the light one order of facts or aspects in the thing before him rather than the rest, is called the idealizing or ideal faculty. To the definitions of the imitative arts above given, in which we said that their business was to imitate natural facts,—one by solid form, another by line, light-and-shade, and color, a third by words in regulated combination,—to these definitions, then, we must now add that the imitation of natural fact in question is not an imitation pure and simple, but an *idealized imitation*, in which the mind acts upon the facts of nature, and sifts and sorts them at its choice, before it represents or puts them on record.

Nature of the idealizing process.

This idealizing faculty is also one of that great cluster of faculties or powers within us for mentally making the most of the world we live in, which are commonly associated together under the comprehensive name imagination. Interminable discussion has been spent on the questions,—What is the ideal, and how do we idealize? The answer has been put in the most sensible form by those thinkers (*e.g.*, Vischer and Lotze) who have pointed out that the process of æsthetic idealization carried on by the artist is only the higher development of a process carried on in an elementary fashion by all men, from the very nature of their constitution. The physical organs of sense themselves do not retain or put on record all the impressions made upon them. When the nerves of the eye receive a multitude of different stimulations at once from different points in space, the sense of eyesight, instead of being aware of all these stimulations singly, only abstracts and retains a total impression of them together. In like manner we are not made aware by the sense of hearing of all the several waves of sound that strike in a momentary succession upon the nerves of the ear; that sense only abstracts and retains a total impression from the combined effect of a number of such waves. And the office which each sense thus performs singly for its own impressions, the mind performs in a higher degree for the impressions of all the senses equally, and for all the other parts of our experience. We are always dismissing or neglecting a great part of our impressions, and abstracting and combining among those which we retain. The ordinary human consciousness works like an artist up to this point; and when we speak of the ordinary or inartistic man as being impartial in the retention or registry of his daily impressions, we mean, of course, in the retention or registry of his impressions as already thus far abstracted and assorted in consciousness. The artistic man, whose impressions affect him much more strongly, carries much farther these same processes of abstraction and combination among his impressions, and according to the complexion of his feelings imparts a color from his own mind both to the literal record of his experiences and to the imaginary constructions which he builds upon them.

Subjective and objective ideals.

It will further help our understanding of what is meant by the ideal in art, if we observe that into the framing of every ideal there enter two parts or elements. These are, a subjective and an objective part or element—or so we may for convenience call them. The artist, affected more than other men by his daily impressions, grows up with certain innate or acquired predilections which become a part of his constitution whether he will or no,—predilections, say, if he is a dramatic poet, for certain types of character and situation; if he is a sculptor, for certain proportions and a certain habitual carriage and disposition of the limbs; if he is a figure painter, for certain moulds of figure and airs and expressions of countenance; if a landscape painter, for a certain class of character, configuration, and sentiment in natural scenery. This is the subjective or purely personal part of the artistic ideal. But on the other hand, as an imitator of fact, the artist has to recognize and accept the character of the facts which he finds at any given moment before him. All facts cannot be of the cast which he prefers, and in so far as he undertakes to deal with facts of an opposite cast he must submit to them; he must study them as they actually are, must abstract, retain, bring into prominence, and carry out their own dominant tendencies. If he cannot find in them what is most pleasing to himself, he will still be led by the abstracting and discriminating powers of his observation to discern what is most significant in *them*, he will emphasize and put on record this, idealizing the facts before him not in his direction but in their own. This, the disengaging and bringing forward of the characteristics actually dominant in any object as he finds it, is the second or objective half of the artist's task of idealization. It is this half upon which M. Taine has dwelt almost exclusively, and on the whole with a just insight into the principles of the operation, in his well-known treatise *On the Ideal in Art*. These two modes of idealization, the subjective and the objective, are not always easy to be reconciled. Though the perfect artist would no doubt be he who should combine the strongest personal instincts of preference with the keenest power of observing characteristics as they are, yet in fact we find few artists in whom both these elements of the ideal faculty have been equally developed. To take some familiar instances among painters: Leonardo da Vinci, haunted as he was above all men by a particular human ideal of intellectual sweetness and alluring mystery, which perpetually recurs in the faces of his women and young men, has yet left us a vast number of exercises which show him as an indefatigable student of objective characteristics and pyschological expressions of an order the most opposed to this. An older painter of the same period, Sandro Botticelli, is on the other hand as good an example as can be named of an artist who could never escape from the dictation of his own personal ideals, in obedience to which he invested all the creations of his art with nearly the same conformation of brows, lips, cheeks, and chin, nearly the same looks of wistful yearning and dejection. If, again, we desire an example of the opposite principle, of that idealism which idealizes above all things objectively, and disengages the very inmost and individual characters, however unattractive or unseemly, of the thing or person before it, we must turn to the northern schools, and especially to the work of Rembrandt; though, indeed, that master's profound sense of human sympathy and commiseration, and his predilection for a certain class of light-and shade effects, throw in this case, too, a veil of distinct personal feeling over his representations.

The imitative arts depend partly on non-imitative elements.

Sculpture, painting, and poetry, then, are arts which represent things known and real, either for their own sakes literally, or for the sake of shadowing forth things not known but imagined. In either case they represent their originals, not indiscriminately as they are, but bettered, completed, or at the least simplified and enforced to our apprehensions, partly by the transmuting power of the artist's own instincts and partly by his discriminating, selecting, and rejecting power among the facts before him. But before we dismiss these arts, we must remember that imitation is not the whole of their task. Just as music and architecture, we saw, though non-imitative arts in the main, admitted occasional and partial elements of imitation, so sculpture, painting, and poetry include non-imitative elements in their turn. Part of the pleasures of sculpture, and a larger part of those of painting, are independent of the representation of natural facts, and depend only, like the pleasures of architecture, on abstract properties of line, color, and light-and-shade. In like manner part of the pleasures of poetry are independent of the images which the words in poetry call up, and depend only, like the pleasures of music, on the melody and emotional suggestiveness of the sounds of those words as they are combined in the line or stanza. It is impossible to distinguish how much of this pleasure which is received by the eye and ear respectively apart from imitation is purely organic pleasure of the senses, and how much is pleasure derived from the association of particular forms, hues, and sounds with desirable and beneficent qualities. Certain it is that there are figures and combinations of line, and patterns and arrangements of color, and successions, transitions, and oppositions of sound, which affect our senses with an organic pleasure; and certain it is no less that there are others which seem to affect them with a similar pleasure from being unconsciously associated in our minds with experiences of efficiency, beneficence, or power. The point at which these kindred pleasures merge into one another it does not here concern us to distinguish, if we could. It is sufficient that the effects of architecture and music depend, as we have learned, almost entirely on their appeal to these pleasures; while the effects of sculpture, painting, and poetry, depending mainly on the pleasures derived from idealized representation of fact, depend on the others also in a secondary but none the less in an indispensable degree. Thus, the outlines, intervals, and shadows of the masses in a work of sculpture are bound to be such as would please the eye, whether the statue or relief represented the figure of anything real in the world or not. The flow and balance of line, and the distribution of colors and light-and-shade, in a picture are bound to be such as would make an agreeable pattern although they bore no resemblance to natural fact (as, indeed, many subordinate applications of this art, in decorative painting and geometrical and other ornaments, do, we know, give pleasure though they represent nothing). The sound of a line or verse in poetry is bound to be such as would thrill the physical ear in hearing, or the mental ear in reading, with a delightful excitement even though the meaning went for nothing. If the imitative arts are to touch and elevate the emotions, if they are to afford permanent delight of the due pitch and volume, it is not a more essential law that their imitation should be of the order which we have defined as ideal, than that they should at the same time exhibit these independent effects which they share with the non-imitative group.

Having now sufficiently drawn attention to the effects presented by the several greater fine arts as divided into an imitative and a non-imitative group, and having found that division the most convenient for the general discussion of the nature of the several arts, if not the most important for practice, we may now pass to another point of view, and consider very briefly the results which are gained by a third mode of classification.

Third classification—the serviceable and non-serviceable arts.

3. *The Serviceable and the Non-Serviceable Arts.*—It has been established from the outset that, though the essential distinction of fine art is to minister not to necessity but to delight, yet among the arts of men there are some which do both these things at once, and add beauty, or the quality which gives us delight, to use, or the quality which satisfies our needs. This double character is inseparable, among the five greater arts, from architecture. We build in the first instance for the sake of necessary shelter and accommodation. By and by we find out that the aspect of our constructions is pleasurable or the reverse. Architecture is the art of building at once as we need and as we like, and a practical treatise on architecture must treat the beauty and the utility of buildings as bound up together. But for our present purpose it has been proper to take into account one half only of the vocation of architecture, the half by which it gives delight, and belongs to that which is the subject of our study, to fine art; and to neglect the other half of its vocation, by which it belongs to what is not the subject of our study, to useful or mechanical art. It is plain, however, that the presence or absence of this foreign element, the element of utility, constitutes a fair ground for a separate classification of the fine arts. If we took the five greater arts only, architecture would on this ground stand alone in one division, as the useful or serviceable fine art; with sculpture, painting, music, and poetry together in the other division, as fine arts unassociated with direct use or service. Not that the divisions would, even thus, be quite sharply and absolutely separated. Didactic poetry, we have already acknowledged, is a branch of the poetic art which aims at practice and utility. Again, the hortatory and patriotic kinds of lyric poetry, from the strains of Tyrtæus to those of Arndt or Rouget de Lisle, may fairly be said to belong to a phase of fine art which is directly concerned, if not with practical needs, at any rate with practical duties. So may the strains of music which accompany such poetry. The same practical character, as stimulating and attuning the mind to definite ends and actions, might indeed have been claimed for the greater part of the whole art of music, as that art was practised in antiquity, when each of several prescribed and highly elaborated moods, or modes, of melody were supposed to have a known effect upon the courage and moral temper of the hearer. In modern music, of which the elements, much more complex in themselves than those of ancient music, have the effect of stirring our fibres to moods of rapturous contemplation rather than of action, military strains in march time are the only purely instrumental variety of the art which may still be said to retain this character.

To reinforce, however, the serviceable or useful division of fine arts in our present classification, it is not among the greater arts that we must look. We must look among the lesser or auxiliary arts of the manual or shaping group. The potter, the joiner, the weaver, the smith, the goldsmith, the glass-maker, these and a hundred artificers who produce wares primarily for use, produce them in a form or with embellishments that have the secondary virtue of giving pleasure to the user. Much ingenuity has been spent to little purpose in attempting to group and classify these lesser shaping arts under one or other of the greater shaping arts, according to the nature of the means employed in each. Thus the potter's art has been classed under sculpture, because he moulds in solid form the shapes of his cups, plates, and ewers; the art of the joiner under that of the architect, because his tables, seats, and cupboards are fitted and framed together, like the houses they furnish, out of solid materials previously prepared and cut; and we ourselves had occasion above to class the weaver and embroiderer, from the point of view of the effects produced by their art, among painters. But the truth is, that each one of these auxiliary handicrafts has its own materials and technical procedure, which cannot, without forcing and confusion, be described by the name proper to the materials and technical procedure of any of the greater arts. The only satisfactory classification of these handicrafts is that now before us, according to which we think of them all together in the same group with architecture, not because any one or more of them may be technically allied to that art, but because, like it, they all yield products capable of being at the same time useful and beautiful. Architecture is the art which fits and frames together, of stone, brick, timber, or iron, the abiding and assembling places of man, all his houses, palaces, temples, workshops, roofed places of meeting and exchange, theatres for spectacle, fortresses of defence, bridges, aqueducts, and ships for seafaring. The wise architect having fashioned any one of these great constructions at once for service and beauty in the highest degree, the lesser or auxiliary manual arts come in to fill, furnish, and adorn it with things of service and beauty in a lower degree, each according to its own technical laws and capabilities; some, like pottery, delighting the user at once by beauty of form, delicacy of substance, and pleasantness of imitative or non-imitative ornament; some, like embroidery, by richness of tissue, and by the same twofold pleasantness of ornament; some, like goldsmith's work, by preciousness of fancy and workmanship proportionate to the preciousness of the material. To this vast group of workmen, whose work is at the same time useful and fine in its degree, the ancient Greek gave the place which is most just and convenient for thought, when he classed them all together under the name of *τέκτονες* or artificers, and called the builder by the name of *ἀρχιτέκτων*, arch-artificer or artificer-in-chief.

Of the manner in which the operation of these auxiliary manual arts has been modified in later times by the increase of mechanical agencies, and of the degree to which the intervention of such agencies, in multiplying one uniform design upon a vast number of wares, is compatible with the true characters of fine art in the product, we have said enough further back. It is time now to turn to the last section of our inquiry.

III. Of the History of the Fine Arts.

Hegel and the doctrine of the three periods.

Under this heading it will not be expected, nor will our space allow, that we should do more than touch in the most general terms on some of the great facts and divisions in the history of the several arts. The students of human culture have within the last hundred years concentrated a great deal of attentive thought upon the history of fine art, and have put forth various comprehensive generalizations intended at once to sum up, and to account for, the phases and vicissitudes of that history. The most famous formula of all is that of Hegel, to which we have already alluded. Hegel, we learned, regarded particular arts as being characteristic of and appropriate to particular forms of civilization and particular ages of history. For him, architecture was the symbolic art appropriate to ages of obscure and struggling ideas, and characteristic of the Egyptian and the Asiatic races of old and of the mediæval age in Europe. Sculpture was the classical art appropriate to ages of lucid and self-possessed ideas, and characteristic of the Greek and Roman period. Painting, music, and poetry were the romantic arts, appropriate to the ages of complicated and overmastering ideas, and characteristic of modern humanity in general. In the working out of these generalizations, Hegel has brought together a great mass of judicious and striking observations; and that they are generalizations containing on the whole a preponderance of truth may be admitted. It has been objected against them, from the philosophical point of view, that they too much mix up the definition of what the several arts theoretically are with considerations of what in various historical circumstances they have practically been. From the historical point of view, there can be taken what seems a more valid objection, that these formulas of Hegel tend too much to concentrate the attention of the student upon the one dominant art chosen as characteristic of any period, and to give him false ideas of the proportions and relations of the several arts at the same period,—of the proportions and relations which poetry, say, really bore to sculpture among the Greeks and Romans, or sculpture to architecture among the Christian nations of the Middle Age. The truth is, that the historic survey gained over any field of human activity from the height of generalizations so vast in their range and scope as these are, must needs, in the complexity of earthly affairs, be a survey too distant to give much guidance until its omissions are filled up by a great deal of nearer study; and such nearer study is apt to compel the student in the long run to qualify the theories with which he has started until they are in danger of disappearing altogether.

Herbert Spencer and the doctrine of Evolution.

Another systematic exponent of the universe, whose system is very different from that of Hegel, Mr. Herbert Spencer, has brought the great scientific generalization of our time, the doctrine of Evolution, to bear, not without interesting results, upon the history of the fine arts and their development. Mr. Herbert Spencer sets forth how the manual group of fine arts, architecture, sculpture, and painting, were in their first rudiments bound up together, and how each of them in the course of history has liberated itself from the rest by a gradual process of separation. These arts did not at first exist in the distinct and developed forms in which we have above described them. There were no statues in the round, and no painted panels or canvases hung upon the wall. Only the rudiments of sculpture and painting existed, and that only as ornaments applied to architecture, in the shape of tiers of tinted reliefs, representing, in a kind of picture-writing, the exploits of kings upon the walls of their temple-palaces. Gradually sculpture took greater salience and roundness, and tended to disengage itself from the wall, while painting found out how to represent solidity by means of its own, and dispensed with the raised surface upon which it was first applied. But the old mixture and union of the three arts, with an undeveloped art of painting and an undeveloped art of sculpture still engaged in or applied to the works of architecture, continued on the whole to prevail through the long cycles of Egyptian and Assyrian history. In the Egyptian palace-temple we find a monument at once political and religious, and into this one class of monument we find concentrated all the energies and faculties of all the artificers of the race. With its incised and pictured walls, its half-detached colossi, its open and its colonnaded chambers, the forms of the columns and their capitals recalling the stems and blossoms of the lotus and papyrus, with its architecture everywhere taking on the characters and covering itself with the adornments of immature sculpture and painting—this structure exhibits within its single fabric the origins of the whole subsequent group of shaping arts. From hence it is a long way to the innumerable artistic surroundings of later Greek and Roman life, the many temples with their detached and their engaged statues, the theatres, the porticos, the baths, the training-schools, with free and separate statues both of gods and men adorning every building and public place, the frescoes upon the walls, the panel-pictures hung in temples and public and private galleries. In the terms of the theory of evolution, the advance from the early Egyptian to the later Greek stage is an advance from the one to the manifold, from the simple to the complex, from the homogeneous to the heterogeneous, and affords a striking instance of that vast and ceaseless process of differentiation and integration which it is the law of all things to undergo. In the Christian monuments of the early Middle Age, again, the arts have gone back to the rudimentary stage, and are similarly attached to and combined with each other. The single monument, the one great birth of art, in that age, is the Gothic church. In this we find the art of applied sculpture exercised in fashions infinitely rich and various, but entirely in the service and for the adornment of the architecture; we find painting exercised in fashions more rudimentary still, principally in the forms of colored imagery in the chancel windows and illuminated miniatures in the pages of missals and service-books. And from this stage again the process of the differentiation of the arts is repeated. It is by a new evolution or unfolding, and by one carried to much farther and more complicated stages than the last had reached, that the arts since the Middle Age have come to the point where we find them to-day; when architecture is applied to a hundred secular uses with not less magnificence, or at least not less desire of magnificence, than that with which it fulfilled its single sacred use of old; with sculpture adorning, or intended to adorn, all our streets and commemorating all our likenesses; with the subjects of painting extended from religion to all life and nature, until this one art has been divided into the dozen branches of history, landscape, still life, genre, anecdote, and the rest. Such being in brief the successive stages, and such the reiterated processes, of evolution among the shaping arts, the action of the same law can be traced in the growth of the speaking or time arts also. Originally poetry and music, the two great speaking arts, were not separated from each other and from the art of bodily motion, dancing. The father of song, music, and dancing, all three, was that savage of whom we have already spoken, who first clapped hands and leapt and shouted in time at some festival of his tribe. From the clapping, or rudimentary rhythmical noise, has been evolved the whole art of instrumental music, down to the entrancing complexities of the modern symphony. From the shout, or rudimentary emotional utterance, has proceeded by a kindred evolution the whole art of vocal music down to the modern opera or oratorio. From the savage leap, or rudimentary expression of emotion by rhythmical movements of the body, has descended every variety of dancing, from the stately figures of the tragic chorus of the Greeks to the *kordax* of their comedy or the *cancan* of modern Paris.

That the theory of evolution serves well to group and to interpret many facts in the history of art we are not disposed to deny, though it would be easy to show that Mr. Herbert Spencer's instances and applications are not sufficient to sustain all the conclusions that he seems to draw from them. Thus, it is perfectly true that the Egyptian or Assyrian palace wall is an instance of rudimentary painting and rudimentary sculpture in subservience to architecture. But it is not less true that races who had no architecture at all, but lived in caverns of the earth, exhibit, as we have already had occasion to notice, the rudiments of the other two arts, in a different form, in the carved or incised handles of their weapons. And it is almost certain that, among the nations of Oriental antiquity themselves, the art of decorating solid walls so as to please the eye with patterns and representations of natural objects was itself borrowed from the precedent of an older art, which works in easier materials, the art of weaving or tapestry. It would be in the perished textile fabrics of the earliest dwellers in the valley of the Nile and the Euphrates that we should find, if anywhere, the origins of the systems of surface design, whether conventional or imitative, which those races afterwards applied to the decoration of their solid constructions. Not in any one exclusive type of primitive artistic activity, but in a score of such types equally, varying according to race, region, and circumstances, shall we find so many germs or nuclei from which whole families of fine arts have in the course of the world's history differentiated and unfolded themselves. And once at least during that history, a cataclysm of all the political and social forces has not only checked the process of the evolution of the fine arts, but from an advanced stage of development has thrown them back again—we speak especially of the manual group—to the primitive stage where they are all practised conjointly and in mutual interdependence. By Mr. Herbert Spencer's application of the theory of evolution, not less than by Hegel's theory of the historic periods, attention is called to the fact that Christian Europe, during several centuries of the Middle Age, presents to our study a civilization analogous to the civilization of the old Oriental empires in this respect, that its ruling and characteristic manual art is architecture, to which sculpture and painting are, as in the Oriental empires, once more subjugated and attached. It does not of course follow that such periods of fusion or mutual dependence among the arts are periods of bad art. On the contrary, each stage of the evolution of any art has its own characteristic excellence. There is an excellence of sculpture as a decorative or subsidiary art, and that it reached in the Gothic age. There is an excellence of sculpture as an independent art, and that it reached in Greece in the 5th century B. C., and again approached in Tuscany in the 15th century A.D. The arts can be employed in combination, and yet be all severally excellent. When music, dancing, acting, and singing were combined in the performance of the Greek chorus, the combination no doubt presented a relative perfection, of each of the four elements analogous to the combined perfection, in the contemporary Doric temple, of pure architectural form, sculptured enrichment of spaces specially contrived for sculpture in the pediments and frieze, and colored decoration over all. The extreme differentiation of any art from every other art, and of the several branches of one art among themselves, does not by any means tend to the perfection of that art. The process of evolution among the fine arts may go, and, indeed, in the course of history has gone, too far. Thus an artist of our own day is usually either a painter only or a sculptor only; but yet it is acknowledged that the painter who can model a statue, or the sculptor who can paint a picture, is likely to be the more efficient master of both arts; and in the best days of Florentine art the greatest men were generally painters, sculptors, architects, and goldsmiths all at once. In like manner a landscape painter who paints landscape only is apt not to paint it so well as one who paints the figure too; and in recent times the skill of engraving had almost perished from the habit of allotting one part of the work, as skies, to one hand, another part, as figures, to a second, and another part, as landscape, to a third. This kind of continually progressing subdivision of labor, which seems to be the necessary law of industrial processes, is fatal to any skill which demands, as skill in the fine arts, we have seen, demands, the free exercise and direction at every moment of a highly complex cluster both of faculties and sensibilities. Turning to the other group of arts, there are reformers who say that the process of evolution and differentiation has in like manner gone too far with music. Music, as separated from words and actions, say Dr. Wagner and his followers,—independent orchestral and instrumental music,—has reached its utmost development, and its farther advance can only be an advance into the inane; while the music that is still associated with words, operatic music, has broken itself up into a number of set and separate forms, as aria, scena, recitative, which correspond to no real varieties of instinctive emotional utterance, and in the aimless production of which the art is in danger of paralyzing and stultifying itself. This process, they say, must be checked; music and words must be brought back again into close connection and mutual dependence; the artificial opera forms must be abolished, and a new and homogeneous musical drama must be created, of which the author shall combine in himself the now differentiated functions of poet, composer, inventor, and director of scenery and stage appliances, so that the entire creation may bear the impress of a single mind.

M. Taine and the doctrine of physical and social causes.

It is thus evident that the evolution theory furnishes us with some instructive points of view for the history of the fine arts as for other things. Another key to what is called the philosophy of that history, although one which has been employed with results perhaps less really luminous than they are certainly showy and attractive, is that supplied by a distinguished French writer, M. Taine. M. Taine's philosophy, which might perhaps be better called a natural history, of fine art, consists in regarding the fine arts as the necessary result of the general conditions under which they are at any time produced—conditions of race, conditions of climate, conditions of religion, civilization, and manners. Acquaint yourself with these conditions as they existed in any given people at any given period, and you will be able to account for the characters assumed by the arts of that people at that period and to reason from one to the other, as a botanist can account for the flora of any given locality and can reason from its soil, exposure, and temperature, to the orders of vegetation which it will produce. This method of treating the history of the fine arts, again, is one which can be pursued with profit, in so far as it makes the student realize the connection of fine art with human culture in general, and teaches him how the arts of any age and country are not an independent or arbitrary phenomenon, but are essentially an outcome, or efflorescence, to use a phrase of Professor Ruskin's, of many deep-seated elements in the civilization which produces them. But it is a method which, rashly used, is very apt to lead to a hasty and one-sided handling both of history and of art. It is easy to fasten on certain obvious relations of fine art to general civilization when you know a few of the facts of both, and to say, the cloudy skies and mongrel industrial population of Amsterdam at such and such a date had their inevitable reflection in the art of Rembrandt; the wealth and pomp of the full-fleshed burghers and burgesses of Antwerp had theirs in the art of Rubens. But to do this in the precise and conclusive manner of M. Taine's treatises on the philosophy of art always means to ignore a large range of conditions or causes for which no corresponding effect is on the surface apparent, and generally, also, a large number of effects for which appropriate causes cannot easily be discovered either. The truth is, that this particular efflorescence of human culture depends for its character at any given time upon combinations of causes which are by no means simple, but generally highly complex, obscure, and nicely balanced. For instance, the student who should try to reason back from the holy and beatified character which prevails in much of the devotional painting of the Italian schools down to the Renaissance would make a great mistake if he were to conclude, "like art, like life, thoughts, and manners." He would not understand the relation of the art to the general civilization of those days unless he were to remember that one of the chief functions of the imagination is to make up for the shortcomings of reality, and to supply to contemplation images of that which is most lacking in actual life; so that the visions at once peaceful and ardent of the religious schools of the Italian cities are to be explained, not by the peace, but rather in great part by the dispeace, of contemporary existence.

Speaking and shaping groups have no common history.

Either of the three modes of generalization to which we have referred might no doubt yield, however, supposing in the student the due gifts of patience and of caution, a working clue to guide him through that immense region of research, the history of the fine arts. But it is hardly possible to pursue to any purpose the history of the two great groups, the shaping group and the speaking group, together. Words are a means of expression which men have generally mastered more quickly than any other; and in Greece all three divisions of the art of poetry, the narrative, lyric, and dramatic, had been perfected, and two of them had again declined, before sculpture reached maturity, or painting had passed beyond the stage of its early severity. Again, many nations have been great in poetry at a time when their other fine arts flourished humbly if at all—as England in the days of Elizabeth. The history of poetry must thus of necessity be a separate study. And so must the history of music. Music in its independent development is an invention,—whether made, as some think, in response to the special needs of modern souls, or, as others hold, simply like other inventions in the progress of human ingenuity—but at any rate an invention of the last two hundred years.

Main periods in the history of shaping group.

On the other hand, it is very possible to take the whole of the shaping group of fine arts together, and to pursue connectedly the history, throughout the course of civilization, of architecture, sculpture, and painting, and of their mutual relations with one another. Being all arts of manual dexterity, and all occupied in providing for our delight objects intended for visual contemplation in space, these have a natural and practical affinity. Leaving aside the arts of the races of Egypt and the East, which, profoundly interesting as they are, have had no direct effect upon ourselves except in so far as they communicated the first hints or germs of inspiration to the ancestors and masters of Western civilization, the Greeks,—leaving those aside, the history of the manual arts of architecture, painting, and sculpture, falls naturally into four great periods or divisions:—(1) the Greek and Roman period, from about 700 B.C. to the final triumph of Christianity, say 400 A.D.; (2) the Christian period, from the triumph of Christianity to about 1260 A.D. in Italy and about 1460 in northern Europe; (3) the Renaissance period, from the above dates till about 1620 A.D.; (4) the modern period, from about 1620 to our own day. We have not set down, as is usually done, a specifically Gothic age in art, for this reason. The characteristic of the whole Christian period is that its dominant art is architecture, chiefly employed in the service of the church, and with the arts of painting and carving only applied subordinately for its enrichment. It makes no essential difference to this fundamental character that from the 5th to the 12th century the forms of this art were derived in the east of Europe from the Byzantine branch, and in the west from the branch usually called Romanesque, of the round-arched architecture of the empire; and that by the 13th century a new form of architecture, in which the round arch was replaced by the pointed, and the decorations took another character, had been invented in France, and from thence spread abroad to Germany, England, Spain, and last to Italy. The essential difference only begins when the imitative arts, sculpture and painting, begin to develop and detach themselves, to exist and strive after perfection on their own account. This happens in Italy with the artificers of the 13th and 14th centuries, with Niccola Pisano and Giotto; and it happens, though the respective arts are still wholly engaged upon ecclesiastical subjects, in connection with an incipient study of and passion for antique models. From this time and onward, that movement of men's minds which gradually enthroned the images of pagan antiquity beside those of Christian worship as the ideal theme of art, continued until, in the 15th century, it communicated itself to the more pious races of the North, and until in Italy it reached its culmination in the genius of Michelangelo and of Raphael. The same movement of the arts held on, with its energy exhausted and its inspiration flagging, until, soon after the beginning of the 17th century, the Dutch school of common life appeared and announced the greatest revolution of all. This is a revolution which has its counterpart in literature too, and which proceeds from a modern manner of regarding life totally different from that of either antiquity, the Christian Middle Age, or the Renaissance. By it the fine arts were brought down from the exclusive regions of the religious and the classical ideal, and launched upon their human, their secular, their democratic, their realistic career, of which who shall as yet foretell the issue? (S. C.)

FINGAL, the name of the chief hero in the English prose epics called the *Poems of Ossian*, written in the last century by James Macpherson, and based to a certain extent upon poems and prose tales to be found in manuscripts written in Irish—the literary language common to both Ireland and Gaelic Scotland—or still preserved in memory by the Celtic-speaking people of both countries. The *Finn ua Baiscni*, or *Find MacCumhaill*, of those poems and tales was, according to all Irish and Scottish traditions, the *Rig*, or king—for that word was one of wider application than in modern times—of the Leinster *Fians* or Fenians (see FENIANS) in the time of the monarch *Cormac* son of *Art;* and he resided at a *Dun*, or fort, at *Almhain*, now the Hill of Allen, in the county of Kildare, whence has come the name of Bog of Allen given to the great central bogs of Ireland. *Grainné*, daughter of *Cormac Mac Airt*, was betrothed to *Find;* but she having eloped with a celebrated warrior of the *Fians*—*Diarmait ua Duibhne*—her father offered him another daughter, *Ailbhé*, distinguished for her wisdom. The elopement of *Diarmait* and *Grainné* and their pursuit by *Find* is the subject of one of the most important of the Irish Fenian tales. *Find's* courtship of *Ailbhé* is also the subject of a curious tale. *Find* is said to have been killed in the year 283 A. D., at a place called *Ath Brea*, on the river Boyne, by a fisherman who thought to distinguish himself thereby. *Find's* sons—*Fergus Finnbheoil*, or the Eloquent, and *Oisín* (the Little Deer)—were poets, and some poems attributed to them still exist. *Oscar*, the celebrated son of *Oisín*, was killed at the battle of Gabhra, which broke the Fenian organization and power; but *Oisín* and a few others survived that battle, and according to popular tradition, lived down to the time of St. Patrick. The Fenian period, though not strictly within the historic period, is so close upon its threshold, that *Find* may have been a real personage. Much that is told of himself and of his father, *Cumall* son of *Trenmore*, might have happened. None of the poems attributed to *Find* himself, or his sons *Oisín* and *Fergus*, though some are in a manuscript of the 12th century, belong, at least in their present form, to the supposed time of the poets. But even if we admit that *Find* and the other Fenians were real personages, they have become, like *Art* and his son *Cormac*, the centres of a luxuriant growth of legend, *Find* himself having grown into a powerful giant.

In taking *Find* as the hero of his new epic, Macpherson changed his name, apparently for euphony sake, to Fingal, and made him king of a fictitious petty kingdom of Morven, corresponding apparently with the deanery of that name in the mediæval diocese of Argyle. The name Fingal is not, however, of his own coinage. A large number of Irish personal names end in the same letters, *e.g.*, *an* (Abban, Aedan, etc.), *nall* (Domhnall, Seachnall, etc.) *gen, gan* (Cellgen, Corrgen, etc.), *gus* (Fergus, Oingus, Snedgus, etc.), *gal* or *ghal* (Fergal, Aedhghal, etc.). The same stem, by the addition of different suffixes, gives a series of names, *e. g.*, *Ferbaeth*, *Fergal*, *Fergus*, etc. The stems are often the names of colors, *e.g.*, *Donngal*, *Dubhgal*, *Gormgal*, *Fingal*, brown, black, blue, fair. According to the *Annals of the Four Masters*, there was an abbot of Lismore in Ireland named Fingal, who died in 741 A. D. The suffix *gal* has been assumed to mean stranger or foreigner, so that Fingal would be the fair stranger. This is, however, a mere guess. The meaning of the stems is equally uncertain; fair, brown, black, are designations which might be applied with propriety to the person, but what shall we say of blue, unless the person first called *Gormgal* painted himself blue with woad after the manner of the ancient Britons. There is even a better justification than mere euphony for the change of *Finn* or *Find* into Fingal. Barbour, in his *Bruce*, written in 1375, has the following interesting passage (*The Brus*, xix. p. 49, Spalding Club edition) proving the ancient use of the form Fingal:—

> "He said, 'Methink, Marthokis sone,
> Richt as Golmakmorn was wone
> To haf fra Fingal his menyhe,
> Richt sa all his fra us has he.'"

In transferring his hero Fingal to Morven, Macpherson was also justified, for that district has an old Fenian topography of its own. Kirke in his *Psalter*, published in 1684, actually calls the districts from Morvaren to Glenelg and the Isles the land of the *Fian* or Fenians. These and the neighboring districts are also intimately associated with the legends of the heroic period of *Cuchulaind*.

FINI. See MASOLINO.

FINIGUERRA, MASO (contraction for TOMMASO), a Florentine goldsmith, is distinguished as the inventor of the method of taking impressions from engraved plates. The date of his birth is not ascertained, and conjectures vary from 1400 to 1426. He was one of the best workers in niello, a form of decorative art then very much in vogue in Italy, which, however, in the next century fell into neglect. He is said to have been a pupil of the famous sculptor Lorenzo Ghiberti, and to have assisted him in the execution of the beautiful bronze gates of the baptistery of Florence; but whether the first or second pair of gates is not stated. Baldinucci makes him a pupil of Masaccio; but it appears probable that he was rather one of those art students who were powerfully influenced by the new style, noble in simplicity, of Masaccio's works, than a personal disciple of the painter. One indisputably genuine work of Finiguerra is still extant, a silver Pax on which is wrought in niello a representation of the Coronation of the Virgin. By some writers it is called an Assumption. It was executed for the church of San Giovanni Battista at Florence, and is still preserved there. It is in height a little more than 4 inches, and in breadth about 3 inches; and within this small space is a composition of more than forty figures, marvellous for accuracy of drawing and minute finish. The date of its completion is fixed by an entry in the city archives, under the year 1452. During the progress of the work the artist, according to the custom, took casts in sulphur from the plate, and also impressions upon damped paper. For these impressions he made use of a smooth roller, which passed over the paper on the plate, and produced impressions that looked like pen drawings. This method was followed by other workers; and thus copper-plate engraving and printing soon became generally practised in Italy. The title of Finiguerra to the discovery was long disputed, especially on the ground that while prints by early German masters were in existence bearing earlier dates than any Italian engravings, not a single print by Finiguerra could be produced in support of his claim. The question was settled by Zani's discovery in 1797, in the National Cabinet of Paris, of the identical impression taken by the artist himself from the silver Pax of San Giovanni. This print is believed to have been executed as early as 1440. Zani's account of his discovery (see Ottley's *History of Engraving*, vol. i. pp. 306–312) is a singularly fascinating narrative, breathing an enthusiasm as intense and a joy as devout as those of a Columbus who first sights a long-sought world. The date of Maso's death is not known. Zani places it about 1460, others about 1475.

FINISTÈRE, or FINISTERRE, the most western department of France, forming part of the old province of Bretagne or Brittany, is bounded on the N.W. and S. by the ocean, and on the E. by the departments of Côtes-du-Nord and Morbihan. It extends from 47° 44′ to 48° 47′ N. lat., and from 3° 22′ to 4° 50′ W. long., being 78 miles in length from north to south by 63 in width, and having an area of 666,705 hectares, or 2574 square miles. Two chains of hills run nearly parallel from east to west through this department, and divide it into three zones of almost equal extent, conveying the waters in three different directions. North of the Arrez, or more northern of the two chains, the waters of the Douron, Jarleuc, Penzé, and Flèche flow northward to the sea. South of the Noires range, the Odet, Aven, Ioste, and Elle flow southward; while the region inclosed by the two chains having a declination westward, the waters of the Aulne and the Elorn flow into the Brest roads. The rivers are all small, and none of the hills attain a height of 900 feet. The coasts are generally steep and rocky, and indented with numerous bays and inlets, affording some excellent harbors, the principal being those of Brest, La Forest, Morlaix, Landernau, Quimper, and Douarnenez. The only navigable rivers are the Aulne, Elorn, and Odet. Off the coast lie a number of islands and rocky islets, the principal of which are Ushant and Bas. The climate is temperate, but rather humid; the prevailing winds are the W., S.W., and N.W. More than a third of the soil is under cultivation, and about an equal proportion is heath or waste land, rather the larger proportion of the remainder being pasturage, and the rest woods and forests. Though so small a portion of the land is under cultivation, the produce of corn is more than sufficient for the population, and might be greatly increased if the primitive agricultural implements and methods still in use were superseded by the introduction of modern improvements. The chief crops are oats, rye, wheat, and barley; flax, hemp, and pulse are also produced. The farm and dairy produce, though plentiful in quantity, is indifferent in quality; but great attention is paid to the breeding and feeding of cattle. In the department there are a large number of orchards and gardens, and vegetables are largely grown for exportation. The fisheries of the coast, particularly the pilchard fishery, employ a great many hands, and render this department an excellent nursery of seamen for the French navy. Finistère is rich in minerals: iron, coal, lead, bismuth, and zinc mines are worked; and there are quarries of granite, slate, marble, and porphyry. The lead mines of Poullaouen and Huelgoat, which yielded a considerable quantity of silver, have not been worked since 1869. The manufactures are linens, woollens, sailcloth, ropes, paper, leather, earthenware, soda, soap, candles, sugar, etc. Shipbuilding is carried on at Brest and other seaports. Finistère is divided into the arrondissements of Quimperlé, Brest, Châteaulin, Morlaix, and Quimper, the town of Quimper being the capital of the department. The population of Finistère in 1872 was 642,963, and 1876 it was 666,106.

FINLAND (Finnish *Suomi*, or *Suomenmaa*, the Swampy Region, of which Finland—Fen Land—is said to be a Swedish translation), a grand-duchy forming an administrative division or government of Russia, lies between 59° 48′ and 70° 6′ N. lat., and 20° 29′ and 32° 47′ E. long. It is bounded on the N. by Norway, on the E. by the governments of Archangel and Olonetz, on the S. by the Gulf of Finland, and on the W. by the Gulf of Bothnia. Its greatest length is 717 miles, greatest breadth 378 miles, the average breadth being about 185 miles; the area is 144,221 square miles. The surface is a labyrinthine mixture of land and water; and the sea-coast, especially in the south and south-west, presents the same succession of fiords and rocky headlands that characterizes the coasts of Norway and Sweden. The fiords of Finland, however, seldom exceed a few miles in extent. The coast is studded with innumerable small islands and rocks called skår; some of these islands, as those of Sveaborg, have been converted into fortresses of great strength. The intricate archipelago of islets and granite and limestone rocks in the Bothnian gulf renders the navigation extremely dangerous. The lakes occupy about 12 per cent. of the area, the marshes 20 per cent., so that Finland is more abundantly supplied with water than any other country in the world. The land appears to have been formerly a sea-bed, which was gradually elevated and is still rising at the rate of about 3·4 feet on the Gulf of Bothnia, and 1·9 feet on the Gulf of Finland in a hundred years. The surface consists of primitive rocks, as gneiss, porphyritic and syenetic granite, diorite, gabbro, and hyperesthene, and of formations allied to the older metamorphic and the Cambrian. Neither fossils nor coal have been found. Geologists suppose that the land, a low table-land, continuous along its north-western and southern borders with two low and flat border-ridges, was long ago covered with an immense ice-sheet, which, creeping from Scandinavia, crossed the Gulf of Bothnia, traversed southern Finland in a direction south by east, crossed the Gulf of Finland, and crept further on in the Baltic provinces. The numberless striæ, the positions and directions of which exclude any suspicion of their having been traced by floating ice, the striation on the islands of the shallow gulfs, together with that of the Onega basin, the Neva valley, and the Baltic provinces, the uninterrupted sheet of till, *i.e.*, of a true unstratified and unwashed morainic deposit covering Finland, the numberless moraines parallel to the glacial striæ, and hundreds of other evidences seem to settle the existence of such an ice-sheet beyond doubt. As to traces of marine formations, there are none above a level of about 100 or 120 feet; only lacustrine deposits cover the till above this level.

The greater portion of the interior is, as has been said, a vast table-land, averaging in height from 350 to 400 feet, and interspersed with hills of no great elevation. Heights of considerable elevation are found only in the most northerly part, where the highest summit, Haldefjåll (Lappish Haldischok), rises to 4124 feet in the north-west on the Norwegian border. Other single mountains reach from 2000 to 3000 feet, and the higher ridges 1000 feet. The land falls towards the south. The principal central ridge Maanselkå (*i.e.*, land-ridge), about 1300 feet high, the watershed between the Arctic Ocean and the Gulf of Bothnia, forms the boundary between Russia and Finland from 68° to 64° N. lat., running thence under the name of Suomen-selka (*i.e.*, Finland-ridge) towards the south-west as far as the Gulf of Bothnia, 62° N. lat. Several spurs run off from this ridge towards the south, forming watersheds, but rising little above the general level of the table-land. The largest plain lies on the narrow middle part of the Gulf of Bothnia.

By the above-mentioned ridges Finland is divided into five great basins. In the south-eastern basin, besides Lake Ladoga on the border, lies Lake Saima, along with 120 larger and several thousand smaller lakes, discharging by the river Wuoksen into Lake Ladoga; in the middle or southern basin is Lake Påijåne, discharging by the river Kymmene into the Gulf of Finland; in the south-west basin the waters unite near the town of Tammerfors in the little lake Pyhåjårvi, and discharge by the river Kumo into the Bothnian Gulf; in the north-west is the Uleå basin, with an outflow by the rivers Uleå, Kemi, and Torneå into the same gulf; the north basin contains Lake Enare (nearly 1000 square miles), covered with ice for ten months in the year, and sending its waters into the Arctic Ocean. The rivers are full of rapids, and rarely navigable, but serve for floating down large quantities of timber from the extensive woods of the interior, and also furnish motive power for many mills. The lakes are united by canals.

The climate of Finland is severe, but generally healthy. The mean yearly temperature in the north is 27·5° Fahr.; at Helsingfors, 38·7°. The average annual rainfall is 20 inches.

Immense forests cover one-half of the area of the country, reaching on the north as far as Lake Enare. They consist chiefly of pine, spruce, fir, and birch, the oak growing wild only in the south, where also are found apples, pears, and cherries. Rye is cultivated as far as the Arctic Circle, barley mostly in the north to Lake Enare, oats as far as 65° N. lat., wheat but little and only in the south, buckwheat and flax to 64° N. lat., hemp to 66°, and potatoes everywhere. The flora includes 1080 phanerogams and 1800 cryptogams. Of wild animals the bear, wolf, fox, ermine, hare and squirrel are the most common, with the lynx, elk, rein-deer; and seals in the sea and in Lakes Ladoga and Saima. Among birds, are the woodcock, moorcock, blackcock, white ptarmigan, partridge, swan, goose, duck. The fish include the salmon, perch, pike, and other common kinds.

The population in 1875 was 1,912,647, divided among the various provinces as follows:—

	Sq. miles.	Population.
Åbo	9,332	318,610
Kuopio	16,499	238,280
Nyland	4,584	183,845
St. Michel	8,818	162,836
Tavastehus	8,333	202,250
Uleåborg	63,954	193,584
Wasa	16,623	324,232
Wiborg	16,078	289,010
	144,221	1,912,647

The yearly increase of the population is at the rate of 1·05 per cent.; the density is one person to 148·6 acres. The population of the 35 towns was, in 1875, 148,355, or 7·7 per cent. of the whole. Of the population 98 per cent. belong to the Lutheran Church, somewhat less than 2 per cent. to the Greco-Russian Church, while Roman Catholics and Jews together number only about 1230; in 1870 there were 86 Mahometans. Of the whole population, 85 per cent. are Finns proper, 14 per cent. are Swedish-speaking farmers and peasants, chiefly in the governments of Nyland, Åbo, and Wasa, on the coasts and islands; Russians number about 6000, besides the military, mostly in the towns; Germans 1200, in Helsingfors and Wiborg; gypsies about 1000; and, to the furthest north, Lapps 600. Agriculture occupies about 80 per cent. of the population; trade, shipping, and manufactures, 7 per cent.; the professions, 1·5 per cent.; military, 1 per cent. The proportion of men to women is 1000 to 1056. The average number of illegitimate births is 7 per cent. The mean duration of life is 37 years, being 35·6 among men and 38·4 among women. The epidemic diseases are typhus, nervous fever, and, in dry summers, diarrhœa. Of the deaths 3 per cent., or 1179 (1874), were violent. Nearly 7000 are whole or half blind. There is some emigration to Russia and the north of Norway, and thence to the United States, chiefly to Michigan.

The chief occupation is agriculture, for which the soil in the south-west and on the coast of Wasa is best adapted. Modern methods of agriculture are found only in the south, the hoe being the principal implement in the east. The area under cultivation is about 2,000,000 acres,—of which 700,000 are occupied with rye, 300,000 with barley, 240,000 with oats, and 600,000 are fallow. Sometimes, especially in the north, the night frosts destroy the crops, and then meal has to be largely imported from Russia. There are ten agricultural schools, two of which are of a higher class. Of the land 35 million acres belong to the crown, 6 millions to the upper classes, and 50 millions to the peasantry. Serfdom never existed in the country.

Of the exports about one-half is timber, though the forests are much thinned by fires, uprooting, and extravagance. Of the land under wood (64 per cent.) 39 per cent. belongs to the crown, under the superintendence of forest-masters, there being one school of forestry. In 1876 there were upwards of 200 saw-mills, the export amounting to 41,536,169 cubic feet—planks, boards, battens, etc., besides 7,432,617 cubic feet of round timber.

Cattle-breeding is successful on account of the many natural meadows, the good pasturage, and abundance of water. Government gives premiums for riding and draught horses, and for improvement in the breeds of horses and cattle. The value of butter and other dairy produce exported in 1875 amounted to nearly £800,000; of horses 250,000, horned cattle 100,000, sheep 900,000, swine 190,000, and rein-deer 60,000 were exported.

The herring fishery is of some importance, while the rivers yield considerable quantities of salmon, and the lakes white-fish (*Coregonus albus*). The export of fish in 1876 was valued at over £100,000.

Granite, marble, felspar, and quartz are quarried to the north of Lake Ladoga, and porphyry on the island of Hogland. There is also an extensive granite quarry at Pytterlahti near Fredrikshamn. Iron-mining and smelting are important industries. In 1876, 68,000 tons of iron ore were raised; 21 iron-works turned out 26,000 tons of cast-iron. Besides this, 13 refining works turned out 16,000 tons of bar-iron. The iron exports in 1874 amounted to 19,230 tons, and the imports were 47,270 tons, half of which consisted of ore; while in 1876 the iron export amounted to only 12,000, and the import to 31,000 tons. Copper and tin are found, and in Lapland a little gold. Lime is obtained nearly everywhere.

Finland has about 420 manufactories of various kinds, giving employment to about 11,000 workpeople. The principal articles manufactured are metal goods, cotton goods, woollen cloth, paper, candles, soap, tobacco, sugar, brandy, beer, leather. The whole production is valued at £1,480,000.

The value of the whole exports in 1876 amounted to £3,948,200, timber representing about one-half, cattle one-seventh, grain about 1 per cent., iron and steel goods about 7 per cent., woven goods 7 per cent., paper 2½ per cent., fish and game nearly 3 per cent., tar 3½ per cent., butter, etc., 21 per cent. The imports were valued at £5,541,710; of this 15 per cent. represented woven goods, grain 17½ per cent., iron and steel 8½ per cent., coffee 7 per cent., sugar 6 per cent., cotton 4½ per cent., tobacco 2½ per cent., salt 2 per cent., wine and spirits 3½ per cent. In 1876 the exports showed an increase in timber, tar, butter, grain, and hides, and a falling off in woollen goods and iron. In the import list a falling off took place in all articles except cotton, petroleum, and coffee. In 1876 the custom-house receipts were £424,603, showing a falling off of about one-tenth as compared with 1875. In the imports Russia holds the first place, Germany being second, Great Britain third, and Norway and Sweden fourth. Russia also comes first in the export list, Great Britain second, and Germany and Norway and Sweden respectively third and fourth. The shipping that entered the various ports numbered 9364 vessels of all kinds, of 1,314,999 registered tons; 9220 vessels of 1,310,679 tons cleared the ports. The Finnish merchant shipping in 1875 numbered 1900 vessels of more than 18½ tons (280,000 tons in all; 125 of these (7103 tons) were steamers. A considerable amount of shipbuilding is carried on on the west coast.

The total length of the state railways is 524 miles, which, with a private railway of 21 miles, connect the capital Helsingfors with Åbo, Hangö, Tammerfors, Tavastehus, Borgå, Wiborg, and St. Petersburg. The longest canal is that known as the Saima canal, 37 miles long, connecting Lake Saima with the Gulf of Finland; besides this there are several smaller canals rendering navigation practicable between several of the lakes. The telegraph, under Russian management, connects nearly all the towns of the country.

The education of Finland is carried on in one university (Helsingfors), 14 lyceums and *realschulen*, one polytechnic, two industrial, six navigation, one cadet, two superior and eight inferior agricultural, two trade schools, besides two schools for the blind, and four for deaf and dumb. These include both state and private schools. For popular instruction there are three normal seminaries and 448 primary schools, most of them Finnish, 67 being Swedish, 5 mixed Finnish and Swedish, and 2 Russian. Besides these there seem to be a number of peripatetic teachers who teach many that do not attend school. In 1875, 24 publishers issued 154 books, which had a sale of a million and a quarter copies. There are 55 journals of various kinds, one-half being Finnish.

The czar of Russia is grand-duke of Finland, the external affairs of both countries being the same. So far as internal administration is concerned, Finland is an independent state. The constitution dates from 1772–1789, and is based besides upon the pledge of the czar Alexander I. in 1809 (when Swedish Finland was annexed), renewed by his successors, and upon the decree of the diet of date 1869. The czar decides as to war and peace, and as to treaties, has the right of pardon, appoints the officials of the country, who, however, must be natives, and is the last appeal in law. The government of the country and the administration of justice are carried on by the Imperial Senate for Finland, consisting of eighteen members appointed by the czar, under the presidency of the governor-general of Finland. The particular affairs on which the czar has to decree are laid before him by the state secretary for Finland. The legislative function is exercised by the czar and diet or landtag (*Seim*), without the consent of which no law can be either ordained or repealed, no new taxes imposed, or soldiers levied. The diet is called together every five years, and consists of the representatives of the nobility, clergy, citizens, and peasantry. The nobility are represented by the heads of the noble families admitted into the House of Nobles; the other deputies are elected, the bishops being admitted on account of their office. The official language is Swedish. For administrative purposes Finland is divided into eight låns or governments, the names of which are given above. An older division was the districts of Finland proper, Åland, Sata-Kunta, Nyland, Tavastland, Karelen, Savolaks, Osterbotten, and Lapland. The låns are divided into *harads* or districts, and these into parishes or communes, of which there are 480, and which have the management of their own internal affairs. The administration of the law lies in the first place with the senate, in the second place with the high courts established in Åbo, Nikolaistad, Wasa, and Wiborg, and finally with the district courts in the country and the municipal courts in the towns. The established religion is that of the evangelical Lutheran Church, under the archbishop of Åbo and the bishops of Borgå and Kuopio. There is an ecclesiastical assembly or convocation every ten years, with thirty-four clerical and fifty lay representatives. There is complete religious freedom for other bodies. The Greco-Russian parishes are under the metropolitan in St. Petersburg.

The public income of the country in 1877 was £1,267,732, and the expenditure £1,267,738, while on January 1, 1878, the debt was £2,462,470. Besides the national bank of Finland, there are two private banks, thirty-nine savings' banks, and three fire insurance establishments. The military force of Finland consists of one battalion of riflemen. The Finnish coinage consists of a *markka* or silver mark of 100 *penni*, equal to about 9½d. In 1878 a new gold coinage was issued, consisting of two pieces of 20 and 10 francs or markka respectively. The Finnish mile is equal to 10 versts or 6·64 English miles. The fathom of 3 ells of 2 Finnish feet is equal to 1·9483 English yards. The *tunland* contains 1·21983 acres. The "ship-pound" contains 374·85 ℔ avoirdupois, the Finnish ℔ being equal to 0·93713 ℔ avoirdupois; the ton is equal to 4·5395 bushels, the last to 1·86 ton register, the "can" to ·57645 imperial gallon.

History.—It was probably at end of the 7th or beginning of the 8th century that the Finns took possession of what is now Finland, though it was only when Christianity was introduced, about 1157, that they were brought into contact with civilized Europe. They probably found the Lapps in possession of the country. The early Finlanders do not seem to have had any governmental organization, but to have lived in separate communities and villages independent of each other. Their mythology consisted in the deification of the forces of nature, as "Ukko," the god of the air, "Tapio," god of the forests, "Ahti," the god of water, etc. These early Finlanders seem to have been both brave and troublesome to their neighbors, and their repeated attacks on the coast of Sweden drew the attention of the kings of that country. King Eric IX. (St. Eric), accompanied by the bishop of Upsala, Henry (an Englishman, it is said), and at the head of a considerable army, invaded the country in 1157, when the people were conquered and baptized. King Eric left Bishop Henry with his priests and some soldiers behind to confirm the conquest and complete the conversion. After a time he was killed, canonized, and as St. Henry became the patron saint of Finland. As Sweden had to attend to her own affairs, Finland was gradually reverting to independence and paganism, when in 1209 another bishop and missionary, Thomas (also an Englishman), arrived, and recommenced the work of St. Henry. Bishop Thomas nearly succeeded in detaching Finland from Sweden, and forming it into a province subject only to the pope. The famous Birger Jarl undertook a crusade in Finland in 1249, compelling the Tavastians, one of the subdivisions of the Finlanders proper, to accept Christianity, and building a castle at Tavastehus. It was Torkel Knutson who conquered and connected the Karelian Finlanders in 1293, and built the strong castle of Wiborg. Almost continuous wars between Russia and Sweden were the result of the conquest of Finland by the latter. In 1323 it was settled that the river Rajajoki should be the boundary between Russia and the Swedish province. After the final conquest of the country by the Swedes, they spread among the Finlanders their civilization, gave them laws, accorded them the same civil rights as belonged to themselves, and introduced agriculture and other beneficial arts. The Reformed religion was introduced into Finland by Gustavus Vasa about 1528, and King John III. raised it to the dignity of a grand-duchy. The country suffered, sometimes deplorably, in most of the wars waged by Sweden, especially with Russia and Denmark. His predecessor having created an order of nobility,—counts, barons, and nobles—Gustavus Adolphus in the beginning of the 17th century established the diet of Finland, composed of the four orders of the nobility, clergy, bourgeois, and peasants. Gustavus and his successor did much for Finland by founding schools and gymnasia, building churches, encouraging learning, and introducing printing. During the reign of Charles XI. (1692–1696) the country suffered terribly from famine and pestilence; in the diocese of Åbo alone 60,000 persons died in less than nine months. Finland has been visited at different periods since by these scourges; so late as 1848 whole villages were starved during a dreadful famine. Peter the Great cast an envious eye on Finland and tried to wrest it from Sweden; in 1710 he managed to obtain possession of the towns of Keksholm and Villmanstrand; and by 1716 all the country was in his power. Meantime the sufferings of the people had been great; thousands perished in the wars of Charles XII. By the peace of Nystad in 1721 the province of Wiborg, the eastern division of Finland, was finally ceded to Russia. But the country had been laid very low by war, pestilence, and famine, though it recovered itself with wonderful rapidity. In 1741 the Swedes made an effort to recover the ceded province, but through wretched management suffered disaster, and were compelled to capitulate in August, 1742, ceding by the peace of Åbo, next year, the towns of Villmanstrand and Fredrikshamn. Nothing remarkable seems to have occurred till 1788, under Gustavus III., who began to reign in 1771, and who gave the Finlanders those fundamental laws by which they are still essentially governed. The country was divided into six governments, a second superior court of justice was founded at Wasa, many new towns were built, commerce flourished, and science and art were encouraged. Latin disappeared as the academic language, and Swedish was adopted. In 1788, however, war again broke out between Sweden and Russia, and was carried on for two years without much glory or gain to either party, the main aim of Gustavus being to recover the lost Finnish province. In 1808, under Gustavus IV., peace was again broken between the two countries, and the war ended by the cession in 1809 of the whole of Finland and the Åland Islands to Russia, which has ever since maintained her supremacy. The Finlanders themselves fought bravely against Russia, and it is said that bribery had not a little to do with the result. The emperor Alexander I. convoked the diet at Borgo in 1809, when he issued a manifesto undertaking to preserve the religion, laws, and liberties of the country. This pledge has been taken by his successors, and probably Finland is the freest and best governed part of the Russian empire. A senate was created and a governor-general named. The province of Wiborg was reunited to Finland in 1811, and Åbo remained the capital of the country till 1821, when the civil and military authorities were removed to Helsingfors, and the university in 1827. The diet, which had not met for 56 years, was convoked by Alexander II. at Helsingfors in 1863, and has met every five years since. Since 1860 Finland has been allowed the use of a coinage peculiar to itself. Under Alexander II. Finland has been on the whole prosperous and progressive. The use of the Finnish tongue is everywhere encouraged, though the upper classes mostly use Swedish, and the study of the Russian language was made compulsory in all the state schools in 1872.

Ethnology and Language.—The term Finns has a wider application than Finland, being, with its adjective Finnic or Finno-Ugric or Ugro-Finnic, the collective name of the westernmost branch of the great Uralo-Altaic family, dispersed throughout Finland, Lapland, the Baltic provinces (Esthonia, Livonia, Courland), parts of Russia proper (south of Lake Onega), both banks of middle Volga, Perm, Vologda, West Siberia (between the Ural Mountains and the Yenissei), and Hungary. It consists of five groups:—(1) the Finns proper; (2) the Lapps; (3) the Permian Finns; (4) Volga Finns; (5) Ugrian Finns. (1) The first group comprises the Suomi or Suomelaisset, *i. e.*, Fen-men, who occupy nearly all Finland except a portion on the Gulf of Bothnia, about Wasa, where Swedish is spoken; next, the Karelians, who extend from Russian Lapland south to the Gulf of Finland and Lake Ladoga, and east to the White Sea and the shores of Lake Onega; thirdly, the Chudic, a Slav term often applied to the whole group, but now restricted to the Veps or northern Chud and the Votic or southern Chud, dwelling in scattered communities round the shores of Lake Onega; and lastly, the Baltic Finns, including the Este or Esthonian, occupying the greater part of the southern coast of the Gulf of Finland and the northern half of Livonia, and the Livonian or Krevinian, occupying a small corner in the north-west of Courland. (2) The Lapps occupy the extreme north-west of Russia, and some parts of northern Sweden and Norway. (3) The Permian Finns comprise the Siryenians, occupying an extensive region between 60° N. lat. and the Arctic circle and 50° E. long. and the Ural Mountains, but mainly in the section of the government of Vologda; the Permian proper, formerly diffused throughout Perm, Viatka, Oufa, etc., now surviving in isolated communities mainly about the upper Kama; and the Votyak, occupying a relatively compact territory in Viatka as far north as Glazov on the river Tchepsa. (4) The Volga Finns include the Cheremissian on the left bank of the Volga, from a little west of Kazan to near Nijni-Novgorod; and the Mordvinian, divided into small communities on both banks of the Volga, about Simbirsk, Samara, Stavropol, and Tambov. (5) The Ugrian Finns include the Voguls, extending from the Ural Mountains east to near the river Obi and south to Tobolsk; the Ostyaks, from the Voguls east to the river Yenissei, between Turuchansk and Yenisseisk, and from the Arctic circle to 59° N. lat.; and the Magyars of Hungary. These five groups form one linguistic family, to which Samoyede is related. The richest and most highly cultivated languages of the family are the Suomi and Magyar. The dialects are all distinctly agglutinative forms of speech, with decided tendencies towards true inflection, so much so that in many grammatical endings the essential difference between agglutination and inflection becomes obscured. As in other Uralo-Altaic tongues, progressive vowel-harmony forms a characteristic feature of the Finnic group. Rask considered the Finnish language the most sonorous and harmonious of tongues. It is maintained by some that the Finnic languages represent the oldest forms among the Uralo-Altaic groups. There is strong evidence that the Finns, or a closely allied race, must have at one time, probably prehistoric, been spread over a considerable area of central if not of western Europe.

Originally nomads (hunters and fishers), all the Finnic people except the Lapps and Ostyaks have long yielded to the influence of civilization, and now everywhere lead settled lives as herdsmen, agriculturists, traders, etc. Physically the Finns are a strong, hardy race, of low stature, with almost round head, low forehead, flat features, prominent cheek bones, eyes mostly gray and oblique (inclining inwards), short and flat nose, protruding mouth, thick lips, neck very full and strong, so that the occiput seems flat and almost in a straight line with the nape; beard weak and sparse, hair no doubt originally black, but, owing to mixture with other races, now brown, red, and even fair; complexion also somewhat brown. The Finns are morally upright, hospitable, faithful, and submissive, with a keen sense of personal freedom and independence, but also somewhat stolid, revengeful, and indolent. Many of these physical and moral characteristics they have in common with the so-called "Mongolian" race, to which they are no doubt ethnically, if not also linguistically, related.

Literature.—Finland can boast of a varied literature more or less indigenous, the great monument of which is, however, the *Kalewala*, a sort of epic poem, which, until the present century, existed only in fragments in the memories and on the lips of the peasantry. A collection of these scattered songs was published in 1822 by Dr. Zacharias Topelius, but it was not till 1835 that anything like a complete and systematically arranged collection was given to the world by Dr. Elias Lönnrot. For years Dr. Lönnrot wandered from place to place in the most remote districts, living with the peasantry, and taking down from their lips all that they knew of their popular songs. After unwearied diligence he was successful in collecting 12,000 lines. These he arranged as methodically as he could into thirty-two runes or cantos, which he published exactly as he heard them sung or chanted. Continuing his researches, Dr. Lönnrot published in 1849 a new edition of 22,793 verses, in 50 runes. The importance of this indigenous epic, as it may be fairly styled, was at once recognized in Europe, and translations were made into Swedish, German, and French. A few specimens have also been translated into English by the late Professor A. Porter, of Yale College, and published at New York (1868). The best foreign editions are those of Castren in Swedish (1844), Leouzon le Duc in French (1845 and 1868), Schiefner in German (1852). The poem has besides given rise to a considerable amount of critical literature, which is worthy of the attention of the comparative mythologist. The poem is written in eight-syllabled trochaic verse, and an idea of its style may be obtained from Longfellow's *Hiawatha*, which is a pretty true imitation of the Finnish epic. Of the merits and importance of the poem Professor Max Müller, than whom there could be no better judge, speaks thus:—"From the mouths of the aged an epic poem has been collected, equalling the *Iliad* in length and completeness; nay—if we can forget for a moment all that *we* in our youth learned to call beautiful—not less beautiful. A Finn is not a Greek, and a Wainamoinen was not a Homer. But if the poet may take his colors from that nature by which he is surrounded, if he may depict the men with whom he lives, *Kalewala* possesses merits not dissimilar from those of the *Iliad*, and will claim its place as the fifth national epic of the world, side by side with the Ionian songs, with the *Mahábhárata*, the *Shahnámeh*, and the *Nibelunge*." The *Kalewala* is concerned entirely with the mythology or folk-lore of the people. In the story there is a certain unity of plot, though the various parts are not perfectly homogeneous, and are evidently the product of different minds at different times, the various songs having evidently received additions in course of time. Indeed, it is probable that the origin of the songs must be sought for in a time when the various branches of the Finns were not so scattered as they are now, certainly before their conversion to Christianity, though in the conclusion there seem to be one or two allusions to Christian subjects. The poem takes its name from the three heroes of Kaleva, the land of plenty and happiness, Wåinåmöinen, Ilmarinen, and Lemmin-Kåinen; it is the struggles of these with Louhi, Hüse, Yorukahainen, and others from Pohjola, a land of the cold north, and from Luonela, the land of death, that are sung. The poem begins with the creation of the world, and after many varied events, ends in the triumph of Wåinåmöinen and his followers. At the time that Dr. Lönnrot collected the Kalewala songs he also collected a considerable quantity of lyric poetry, which he published under the name of *Kanteletar*, from the name of the national instrument to which they are sung—*Kantele*, a species of harp with five strings. Of recent poets the most popular seems to be Paavo Korrhoinen, a peasant whose productions are characterized by sharp and biting sarcasm. His songs were published at Helsingfors in 1848. Other modern poets are Marteska, Kettunen, Ilahainen, Oksaselta. The Finns are strong in proverbs, Lönnrot having published a collection of upwards of 7000, with about 2000 charades, while considerable collections of legends and tales have been published.

The first book printed in Finnish was in the middle of the 16th century, and was probably the *Abecedarium* (1543) of Michael Agricola, bishop of Åbo. A translation of the New Testament by the same bishop appeared in 1548, at Stockholm. The whole Bible was not translated into Finnish till 1642. Even during last, but especially during the present century, there has been considerable literary activity in Finland, so that now books in almost every branch of research are found in the language, mainly translations or adaptations. We meet with, during the present century, a considerable number of names of poets and dramatists, no doubt very minor, as also painters, sculptors, and musical composers. At the Paris International Exhibition of 1878 several native Finnish painters and sculptors exhibited works which would do credit to any country; and both in the fine and applied arts Finland occupied a position thoroughly creditable. An important contribution to a history of Finnish litterature is Krohn's *Suomenkielinen runollisuus ruotsinvallan aikana* (1862). Finland is wonderfully rich in periodicals of all kinds, the publications of the Finnish Societies of Literature and of Sciences and other learned bodies being specially valuable. The Finnish Literary Society has within the last few years published a new edition of the works of the father of Finnish history, Henry Gabriel Porthan (died 1804). A valuable handbook of Finnish history was published at Helsingfors in 1869–73, by Yrjö Koskinen, and has been translated into both Swedish and German. The author, however, is understood to be really a Swede, whose name is Georg Forsman, the above form being a Finnish translation. Other works on Finnish history have also appeared within the last four or five years. Some important works in Finnish geography have also appeared during the same period. In language we have Lönnrot's great Finnish-Swedish dictionary, now being published by the Finnish Literary Society. In this connection the student may be glad to know of Dr. Donner's *Comparative Dictionary of the Finno-Ugric Languages* (Helsingfors and Leipsic), in German. In other departments works of importance have not been infrequent during the present decade; most of them apparently are in Swedish. A valuable sketch of recent Finnish literature will be found in the *Russische Revue* (iv. Jahrgang, 4 and 6 Hefte). (J. S. K.)

FINLAY, GEORGE (1799–1875), the historian of Greece "from its conquest by the Romans to the present time," was born of Scottish parents at Faversham, Kent, on the 21st of December, 1799. His father, Major John Finlay, R.E., F.R.S., who had held for some time the post of inspector of the Government powder-mills at Faversham and Waltham Abbey, died when George was still very young (1802); but the boy has left on record how his interest in historical studies was awakened at a very early age by the manner in which his mother used to explain the history of England. On the second marriage of his mother, he was sent to a boarding-school near Liverpool, where he spent three years,—not very profitably, according to his own account. Afterwards his education was continued in more favorable circumstances under a private tutor in the house of his uncle, Mr. Kirkman Finlay, who at that time sat as member of parliament for the Glasgow district of burghs. While making good progress in his literary education, he at the same time laid up pleasant and life-long memories of the boating, fishing, and pedestrian excursions for which the picturesque shores of the Firth of Clyde offer so many delightful facilities. At one time he had entertained thoughts of entering the army; but having been dissuaded from this by his friends, he ultimately, at the close of his university curriculum in arts, made choice of the legal profession. He received his preliminary technical training in a writer's office in Glasgow, and, when little over twenty years of age, went to Göttingen to complete his studies in Roman law. But before this time he had begun to feel a deep interest in the contemporary affairs of Greece, and at the Hanoverian university he was wholly unable to withdraw his attention from the stirring drama which was then being unfolded in the south-eastern corner of Europe. "I conversed much," he says, "with everybody I met who had visited Greece, read all the works of modern travellers, and associated a great deal with the only Greek who was then studying at Göttingen." In 1823 he resolved to visit the country personally, in order that he might judge for himself of the condition of the people and the prospects of the war. In November accordingly he arrived in Cephalonia, where he first met Lord Byron, by whom, as well as by Sir Charles Napier, the British resident, he was very kindly received. Shortly afterwards he was landed at Pyrgos, and during the next fourteen months, which were spent partly at Athens and partly at Missolonghi, he greatly improved his knowledge of the language, history, and antiquities of the country. While soon led to form a very unfavorable opinion of the rapacity, selfishness, and incompetency of the Greek leaders, both civil and military, he by no means lost his enthusiasm for the cause of Greek independence. A severe attack of fever, however, combined with other circumstances to make a change of scene desirable in December, 1824. The rest of that winter accordingly and the spring of 1825 were spent in Rome, Naples, and Sicily. After spending a summer at Castle Toward, Argyllshire, he went to Edinburgh, where he attended classes in the university, and passed his examination in civil law with a view to being called to the Scottish bar. His unquenched enthusiasm for Greece, however, made it impossible for him to resist the pressing invitation of his friend Hastings that he should return to that country, and thenceforward, if we except a few brief journeys (one to England in 1826 in order to secure the services of some competent engineers), the remainder of his life was wholly spent in the land of his adoption. He took part in the unsuccessful operations of Lord Cochrane and Sir Richard Church for the relief of Athens in 1827. When independence had been secured in 1829, under the presidency of Capodistrias, he was induced by the prospect of peaceful progress to buy a landed estate in Attica, hoping in this way to aid in putting the country "into the road that leads to a rapid increase of production, population, and material improvement." These hopes were not realized; all his efforts for the introduction of a better system of agriculture ended in failure; within a very few years he found that he had lost his capital as well as his labor in his generous but ill-rewarded enthusiasm. Only when it had become too plain to him that Greece could be served in no other way, did he form the resolve of giving himself to the literary work which occupied, somewhat sadly, all the remainder of his life. "Had the hopes with which I joined the cause of Greece in 1823 been fulfilled, it is not probable that I should have abandoned the active duties of life, and the noble task of laboring to improve the land, for the sterile task of recording its misfortunes." So he writes in 1855. His first publications were *The Hellenic Kingdom and the Greek Nation* (London, 1836); *Essai sur les principes de banque appliqués à l'état actuel de la Grèce* (Athens, 1836); and *Remarks on the Topography of Oropia and Diacria, with a map* (Athens, 1838). The first instalment of his great historical work appeared in 1844 (the 2d edition in 1857) under the title *Greece under the Romans: a Historical View of the Condition of the Greek Nation from the time of its Conquest by the Romans until the Extinction of the Roman Empire in the East.* Meanwhile he had been qualifying himself still further for his task by travel as well as by reading; he undertook several tours (one in the company of Karl Ritter) to various quarters of the Levant; and as the result of one of them he published a volume *On the Site of the Holy Sepulchre; with a plan of Jerusalem* (London, 1847). The *History of the Byzantine and Greek Empires from 716–1403* was completed in 1854. It was speedily followed by the *History of Greece under Othoman and Venetian Domination* (1856), and by the *History of the Greek Revolution* (Edinburgh, 1861). In weak health, and conscious of failing energy, he now gave the last years of his life to the task of revising, supplementing, and partly rewriting his great work. From 1864 to 1870 he was also correspondent of the *Times* newspaper, and at various periods he contributed articles to *Blackwood's Magazine*, the *Athenæum*, and the *Saturday Review*. He was a member of several learned societies; and in 1854 he received from the university of Edinburgh the honorary degree of LL.D. He died at Athens on the 26th of January, 1875. A new edition of his *History*, "revised throughout, and in part rewritten, with considerable additions, by the author, and edited by the Rev. H. F. Tozer, M.A.," with a portrait by Jeens, was issued from the Oxford Clarendon press in 1877. It includes a brief but extremely interesting fragment of an autobiography of the author. As an historian Finlay had the merit, which was also to some extent the advantage, of entering upon a field of research that had been previously wholly neglected by English writers, Gibbon alone being a partial exception. He brought to his work many admirable qualities; as a student he was laborious, as a scholar he was accurate, as a thinker he was both acute and profound; and in all that he wrote he was unswerving in his loyalty to the principles of constitutional government and to the cause of liberty and justice. The portion of his work which extends from 146 B.C. to 1453 A.D. has been translated into German.

FIORENZUOLA, a small town of Italy, in the province of Piacenza, about 13 miles from the city of that name, on the right of the Arda, which is there crossed by a noble bridge. The ancient towers in the piazza, the collegiate church of S. Fiorenzo with its beautiful carved work, and the old Palazzo Grossi are the principal objects of interest. The town is of no small antiquity, and in the 9th century it was the scene of a sanguinary battle between Berenger of Italy and Rudolph II. of Burgundy. The Scotti, the Visconti, the Pallavicini, and the Farnesi were successively in possession of the fee. In the vicinity are the ruins of the old city of Veleia, which was overthrown by a landslip in the 4th century. Population of the town in 1871, 3295; of the commune, 6730.

FIORILLO, Johann Dominicus (1748–1821), German painter and historian of art, was born at Hamburg, October 13, 1748. He received his first instructions in art at an academy of painting at Baireuth; and in 1761, to continue his studies, he went first to Rome, where for four years he was the pupil of Batoni, and next to Bologna, where he studied under Bigari and Dulli. He distinguished himself sufficiently to attain in 1769 admission to the academy of that city. Returning soon after to Germany, he obtained the appointment of historical painter to the court of Brunswick. In 1781 he removed to Göttingen, occupied himself as a drawing-master, and was named in 1784 keeper of the collection of prints at the university library. He was appointed professor extraordinary in the philosophical faculty in 1799, and ordinary professor in 1813. During this period he had made himself known as a writer by the publication of his *Geschichte der zeichnenden Künste*, in 5 vols. (1798–1808). This was followed in 1815 to 1820 by the *Geschichte der zeichnenden Künste in Deutschland und den vereinigten Niederlanden*, in 4 vols. These works, though not attaining to any high mark of literary excellence, are esteemed for the information collected in them, especially on the subject of art in the later Middle Ages. Fiorillo practised his art almost till his death, but has left no memorable masterpiece. The most noticeable of his paintings is perhaps the Surrender of Briseis. He died at Göttingen, September 10, 1821.

FIR, the name originally given by our Scandinavian forefathers to the Scotch pine (*Pinus sylvestris*), is at present not unfrequently employed as a general term for the whole of the true Conifers (*Abietinæ*); but in a more exact sense, it has been transferred to the "spruce" and "silver firs," the genera *Abies* and *Picea* of most modern botanists.

The firs are distinguished from the pines and larches by having their needle-like leaves placed singly on the shoots, instead of growing in clusters from a sheath or abortive branch. Their cones are composed of thin, rounded, closely-imbricated scales, furnished in some species with bracts springing from the base. The trees have usually a straight trunk, and a tendency to a conical or pyramidal growth,—throwing out each year a more or less regular whorl of branches from the foot of the leading shoot, while the buds of the lateral boughs extend horizontally.

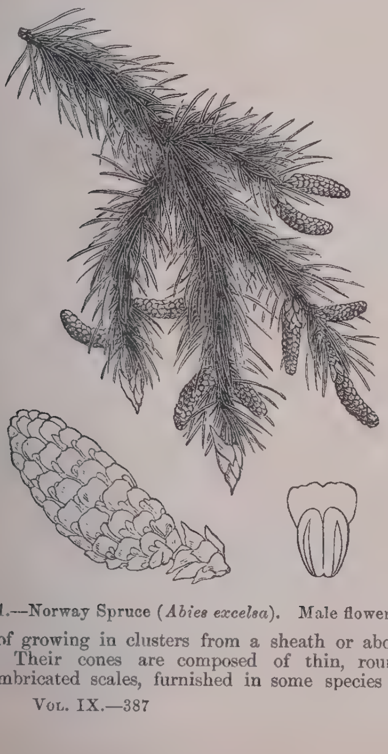

Fig. 1.—Norway Spruce (*Abies excelsa*). Male flowers.

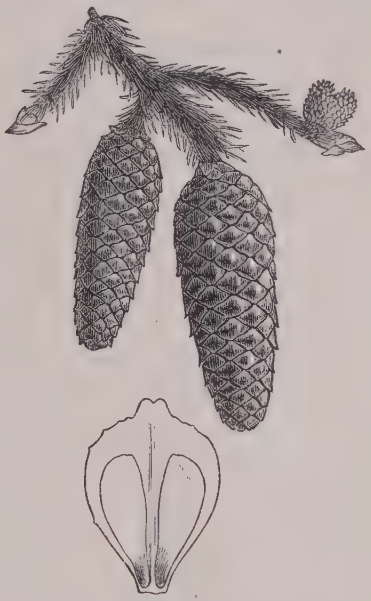

Fig. 2.—Norway Spruce (*Abies excelsa*). Cones; scales with seeds.

In the Spruce Firs (*Abies*), the cones are pendent when mature and their scales persistent; the leaves are arranged all round the shoots, though the lower ones are sometimes directed laterally. In the sub-genus *Picea*, the Silver Firs, the cones are erect, and their scales drop off when the seed ripens; the leaves are placed in distinct rows on each side of the shoot.

The most important of the firs, in an economic sense, is the Norway Spruce (*Abies excelsa*), so well known in British plantations, though rarely attaining there the gigantic height and grandeur of form it often displays in its native woods. Under favorable circumstances of growth it is a lofty tree, with a nearly straight, tapering trunk, throwing out in somewhat irregular whorls its wide-spreading branches, densely clothed with dark, clear-green foliage. The boughs and their side-branches, as they increase in length, have a tendency to droop, the lower tier, even in large trees, often sweeping the ground,—a habit that, with the jagged sprays, and broad, shadowy, wave-like foliage masses, gives a peculiarly graceful and picturesque aspect to the Norway spruce. The slender, sharp, slightly curved leaves are scattered thickly around the shoots; the upper ones pressed towards the stem, and the lower directed sideways, so as to give a somewhat flattened appearance to the individual sprays. The elongated, cylindrical cones grow chiefly at the ends of the upper branches; they are purplish at first, but become afterwards green, and eventually light brown; their scales are slightly toothed at the extremity; they ripen in the autumn, but seldom discharge their seeds until the following spring.

The tree is very widely distributed, growing abundantly on most of the mountain ranges of northern and central Europe; while in Asia it occurs at least as far east as the Lena, and in latitude extends from the Altaic ranges to beyond the Arctic circle. On the Swiss Alps it is one of the most prevalent and striking of the forest trees, its dark evergreen foliage often standing out in strong contrast to the snowy ridges and glaciers beyond. In the lower districts of Sweden it is the predominant tree in most of the great forests that spread over so large a portion of that country. In Norway it constitutes a considerable part of the dense woods of the southern dales, flourishing, according to Schübeler, on the mountain slopes up to an altitude of from 2800 to 3100 feet, and clothing the shores of some of the fjords to the water's edge; in the higher regions it is generally mingled with the pine. Less abundant on the western side of the fjelds, it again forms woods in Nordland, extending in the neighborhood of the coast nearly to the 67th parallel; but it is, in that arctic climate, rarely met with at a greater elevation than 800 feet above the sea, though in Swedish Lapland it is found on the slope of the Sulitelma as high as 1200 feet, its upper limit being everywhere lower than that of the pine. In all the Scandinavian countries it is known as the *Gran* or *Grann.* Great tracts of low country along the southern shores of the Baltic and in northern Russia are covered with forests of spruce. It everywhere shows a preference for a moist but well-drained soil, and never attains its full stature or luxuriance of growth upon arid ground, whether on plain or mountain—a peculiarity that should be remembered by the planter. In a favorable soil and open situation it becomes the tallest and one of the stateliest of European trees, rising sometimes to a height of from 150 to 170 feet, the trunk attaining a diameter of from 5 to 6 feet at the base. But when it grows in dense woods, where the lower branches decay and drop off early, only a small head of foliage remaining at the tapering summit, its stem, though frequently of great height, is rarely more than 1½ or 2 feet in thickness. Its growth is rapid, the straight leading shoot, in the vigorous period of the tree, often extending 2½ or even 3 feet in a single season. In its native habitats it is said to endure for several centuries; but in those countries from which the commercial supply of its timber is chiefly drawn, it attains perfection in from 70 to 90 years, according to soil and situation.

In the most prevalent variety of the Norway spruce the wood is white, apt to be very knotty when the tree has grown in an open place, but, as produced in the close northern forests, often of fine and even grain. Immense quantities are imported into Britain from Norway, Sweden, and Prussia, under the names of "white Norway," "Christiania," and "Danzig deal." The larger trees are sawn up into planks and battens, much used for the purposes of the builder, especially for flooring, joists, and rafters. Where not exposed to the weather, the wood is probably as lasting as that of the pine, but, not being so resinous, appears less adapted for out-door uses. Of late years great quantities have been sent from Sweden in a manufactured state, in the form of door- and window-frames and ready-prepared flooring, and much of the cheap "white deal" furniture is made of this wood. The younger and smaller trees are remarkably durable, especially when the bark is allowed to remain on them; and most of the poles imported into Britain for scaffolding, ladders, mining-timber, and similar uses are furnished by this fir. Small masts and spars are often made of it, and are said to be lighter than those of pine. The best poles, according to Monteath, are obtained in Norway from small, slender, drawn-up trees, growing under the shade of the larger ones in the thick woods, these being freer from knots, and tougher from their slower growth. A variety of the spruce, abounding in some parts of Norway, produces a red heart-wood, not easy to distinguish from that of the Norway pine (Scotch fir), and imported with it into England as "red deal" or "pine." This kind is sometimes seen in plantations, where it may be recognized by its shorter, darker leaves, and longer cones. The smaller branches and the waste portion of the trunks, left in cutting up the timber, are exported as fire-wood, or used for splitting into matches, an industry that has lately sprung up in Sweden. Recently, the wood of the spruce has been employed in the manufacture of paper-stuff, being first reduced to a state of fine division, and then deprived of its resin by long boiling in alkaline solutions,—an application that will probably be considerably extended with the wider employment of paper-pulp in the useful arts.

The resinous products of the Norway spruce, though yielded by the tree in less abundance than those furnished by the pine, are of considerable economic value. In Scandinavia a thick turpentine oozes from cracks or fissures in the bark, forming by its congelation a fine yellow resin, known commercially as "spruce rosin," or "frankincense;" it is also procured artificially by cutting off the ends of the lower branches, when it slowly exudes from the extremities. In Switzerland and parts of Germany, where it is collected in some quantity for commerce, a long strip of bark is cut out of the tree near the root; the resin, that slowly accumulates during the summer, is scraped out in the latter part of the season, and the slit enlarged slightly the following spring to insure a continuance of the supply. The process is repeated every alternate year, until the tree no longer yields the resin in abundance, which under favorable circumstances it will do for twenty years or more. The quantity obtained from each fir is very variable, depending on the vigor of the tree, and greatly lessens after it has been subjected to the operation for some years. Eventually the tree is destroyed, and the wood rendered worthless for timber, and of little value even for fuel. From the product so obtained most of the better sort of "Burgundy pitch" of the druggists is prepared. The resin collected from the fir is melted and boiled in water, then filtered through a sackcloth bag, and left to congeal in a cask beneath; nearly half the original amount of resin is obtained in this purified condition. Its chief employment is for plasters, much used in disorders of the chest and other complaints in which a mild stimulant to the skin is required. It is often applied in conjunction with the spruce-rosin itself and other ingredients. Much of the so-called Burgundy pitch of the shops is, according to Pereira, a compound of common rosin, palm oil, and water. By distillation with water the resin of the spruce yields oil of turpentine; but only a comparatively small quantity of that of commerce is obtained from this source, and it is considered inferior to that yielded by the pine and larch. By the peasantry of its native countries the Norway spruce is applied to innumerable purposes of daily life. The bark and young cones afford a tanning material, inferior, indeed, to oak-bark, and hardly equal to that of the larch, but of value in countries where substances more rich in tannin are not abundant. In Norway the sprays, like those of the juniper, are scattered over the floors of churches and the sitting-rooms of dwelling-houses, as a fragrant and healthful substitute for carpet or matting. The young shoots are also given to oxen in the long winters of those northern latitudes, when other green fodder is hard to obtain. In times of scarcity the Norse peasant-farmer uses the sweetish inner bark, beaten in a mortar and ground in his primitive mill with oats or barley, to eke out a scanty supply of meal, the mixture yielding a tolerably palatable though somewhat resinous substitute for his ordinary *flad-brod.* A decoction of the buds in milk or whey is a common household remedy for scurvy; and the young shoots or green cones form an essential ingredient in the spruce beer drank with a similar object, or as an occasional beverage. The well-known "Danzig-spruce" is prepared by adding a decoction of the buds or cones to the wort or saccharine liquor before fermentation. Similar preparations are in use wherever the spruce fir abounds. The wood is burned for fuel, its heat-giving power being reckoned in Germany about one-fourth less than that of beech. From the wide-spreading roots string and ropes are manufactured in Lapland and Bothnia: the longer ones which run near the surface are selected, split through, and then boiled for some hours in a ley of wood-ashes and salt, which, dissolving out the resin, loosens the fibres and renders them easily separable, and ready for twisting into cordage. Light portable boats are sometimes made of very thin boards of fir, sewn together with cord thus manufactured from the roots of the tree.

The Norway spruce seems to have been the "Picea" of Pliny, but is evidently often confused by the Latin writers with their "Abies," the *Picea pectinata* of modern botanists. From an equally loose application of the word "fir" by our older herbalists, it is difficult to decide upon the date of introduction of this tree into Britain; but it was commonly planted for ornamental purposes in the beginning of the 17th century. In places suited to its growth it seems to flourish nearly as well as in the woods of Norway or Switzerland; but as it needs for its successful cultivation as a timber tree soils that might be turned to agricultural account, it is not so well adapted for economic planting in Britain as the Scotch fir or larch, which come to perfection in more bleak and elevated regions, and on comparatively barren ground, though it may perhaps be grown to advantage on some moist hill-sides and mountain hollows. Its great value to the English forester is as a "nurse" for other trees, for which its dense leafage and tapering form render it admirably fitted, as it protects, without overshading, the young saplings, and yields salable stakes and small poles when cut out. For hop-poles it is not so well adapted as the larch. As a picturesque tree, for park and ornamental plantation, it is among the best of the conifers, its color and form contrasting yet harmonizing with the olive green and rounded outline of oaks and beeches, or with the red trunk and glaucous foliage of the pine. When young its spreading boughs form good cover for game. The fresh branches, with their thick mat of foliage, are useful to the gardener for sheltering wall-fruit in the spring. In a good soil and position the tree sometimes attains an enormous size: one in Studley Park, Yorkshire, was, a few years back, nearly 140 feet in height, and the trunk more than 6 feet in thickness near the ground. The spruce bears the smoke of great cities better than most of the *Abietinæ;* but in suburban localities after a certain age it soon loses its healthy aspect, and is apt to be affected with blight (*Eriosoma*), though not so much as the Scotch fir and most of the pines.

The Black Spruce (*Abies nigra*) is a tree of more formal growth than the preceding. The branches grow at a more acute angle and in more regular whorls than those of the fir of Norway; and, though the lower ones become bent to a horizontal position, they do not droop, so that the tree has a much less elegant appearance. The leaves, which grow very thickly all round the stem, are short, nearly quadrangular, and of a dark grayish green. The cones, produced in great abundance, are short and oval in shape, the scales with rugged indented edges; they are deep purple when young, but become brown as they ripen. The tree abounds throughout New England, Nova Scotia, and all the countries around the St. Lawrence, in Canada growing up to 65°,—in all these regions often forming a large part of the dense forests. A variety with lighter foliage and reddish bark is common in Newfoundland and some districts on the mainland adjacent. The trees usually grow very close together, the slender trunks rising to a great height bare of branches; but they do not attain the size of the Norway spruce, being seldom taller than 60 or 70 feet, with a diameter of 1½ or 2 feet at the base. This species prefers a peaty soil, and often grows luxuriantly in very moist situations. The wood is strong, light, and very elastic, forming an excellent material for small masts and spars, for which purpose the trunks are used in America, and exported largely to England. The sawn timber is inferior to that of *A. excelsa*, besides being of a smaller size. In the countries in which it abounds, the log-houses of the settlers are often built of the long straight trunks. The spruce-beer of America is generally made from the young shoots of this tree. The small twigs, tied in bundles, are boiled for some time in water with broken biscuit or roasted grain; the resulting decoction is then poured into a cask with molasses, or maple sugar, and a little yeast, and left to ferment. It is often made by the settlers and fishermen of the St. Lawrence countries, being esteemed as a preventive of scurvy. The American "essence of spruce," occasionally used in England for making spruce-beer, is obtained by boiling the shoots and buds and concentrating the decoction. The resinous products of the tree are of no great value.

The White Spruce (*Abies alba*), sometimes met with in English plantations, is a tree of lighter growth than the black spruce, the branches being more widely apart; the foliage is of a light glaucous green; the small light-brown cones are more slender and tapering than in *A. nigra*, and the scales have even edges. It is of comparatively small size, but is of some importance in the wilds of the Canadian dominion, where it is found further north than any other tree, growing up to at least 69°; the slender trunks yield the only useful timber of some of the more desolate northern regions. In the woods of Canada it occurs frequently, mingled with the black spruce and other trees. The fibrous tough roots, softened by soaking in water, and split, are used by the Indians and voyageurs to sew together the birch-bark covering of their canoes; and a resin that exudes from the bark is employed to varnish over the seams.

The Hemlock Spruce (*A. canadensis*) is a large tree, abounding in most of the north-eastern parts of America up to Labrador; in Lower Canada, New Brunswick, and Nova Scotia it is often the prevailing tree. The short leaves are flat, those above pressed close to the stem, and the others forming two rows; they are of a rather light green tint above, whitish beneath. The cones are very small, ovate, and pointed. The large branches droop, like those of the Norway spruce, but the sprays are much lighter and more slender, rendering the tree one of the most elegant of the conifers, especially when young. When old, the branches broken and bent down by the winter snows, give it a ragged but very picturesque aspect. The trunk is frequently three feet thick near the base. The hemlock prefers rather dry and elevated situations, often forming woods on the declivities of mountains. The timber is very much twisted in grain, and liable to warp and split, but is used for making plasterers' laths and for fencing; "shingles" for roofing are sometimes made of it. The bark, split off in May or June, forms one of the most valuable tanning substances in Canada. The sprays are sometimes used for making spruce-beer and essence of spruce.

The Douglas Spruce (*A. Douglasii*) is one of the finest trees of the genus, often rising to a height of 200 feet and sometimes considerably more, while the gigantic trunk frequently measures 8 or 10 feet across. The yew-like leaves spread laterally, and are of a deep green tint; the cones are furnished with tridentate bracts that project far beyond the scales. It forms extensive forests in Vancouver's Island, British Columbia, and Oregon, whence the timber is exported, being highly prized for its strength, durability, and even grain, though very heavy; it is of a deep yellow color, abounding in resin, which oozes from the thick bark. It was introduced into Britain soon after its discovery by Douglas, and has been planted in some parts of the kingdom experimentally, but does not appear to flourish well in the climate of England generally, though individual plants may be occasionally seen in good condition in ornamental shrubberies.

Of the *Picea* group, the Silver Fir (*P. pectinata*) may be taken as the type,—a lofty tree, rivalling the Norway spruce in size, with large spreading horizontal boughs curving upward towards the extremities. The flat leaves are arranged in two regular, distinct rows; they are deep green above, but beneath have two broad white lines, which, as the foliage in large trees has a tendency to curl upwards, give it a silvery appearance from below. The large cones stand erect on the branches, are cylindrical in shape, and have long bracts, the curved points of which project beyond the scales. When the tree is young the bark is of a silvery gray, but gets rough with age. This tree appears to have been the true "Abies" of the Latin writers—the "pulcherrima abies" of Virgil. From early historic times it has been held in high estimation in the south of Europe, being used by the Romans for masts and all purposes for which timber of great length was required. It is at present abundant in most of the mountain ranges of southern and central Europe, but is not found in the northern parts of that continent. In Asia it occurs on the Caucasus and Ural, and in some parts of the Altaic chain. Extensive woods of this fir exist on the southern Alps, where the tree grows up to nearly 4000 feet; in the Rhine countries it forms great part of the extensive forest of the Hochwald, and occurs in the Black Forest and in the Vosges; it is plentiful likewise on the Pyrenees and Apennines. The wood is inferior to that of *Abies excelsa*, but, being soft and easily worked, is largely employed in the countries to which it is indigenous for all the purposes of carpentry. Articles of furniture are frequently made of it, and it is in great esteem for carving and for the construction of stringed instruments. Deficient in resin, the wood is more perishable than that of the spruce fir when exposed to the air, though it is said to stand well under water. The bark contains a large amount of a fine, highly-resinous turpentine, which collects in tumors on the trunk during the heat of summer. In the Alps and Vosges, this resinous semi-fluid is collected by climbing the trees, and pressing out the contents of the natural receptacles of the bark into horn or tin vessels held beneath them. After purification by straining, it is sold as "Strasburg turpentine," much used in the preparation of some of the finer varnishes. Burgundy pitch is also prepared from it by a similar process as that from *Abies excelsa.* A fine oil of turpentine is distilled from the crude material; the residue forms a coarse rosin. Introduced into Britain in the 17th century, the silver fir has become common there as a planted tree, though, like the Norway spruce, it rarely comes up from seed scattered naturally. There are many fine trees in Scotland; one near Roseneath, figured by Strutt in his *Sylva Britannica*, then measured more than 22 feet round the trunk. In the more southern parts of the island it often reaches a height of 90 feet, and specimens exist considerably above that size; but the young shoots are apt to be injured in severe winters, and the tree on light soils is also hurt by long droughts, so that it usually presents a ragged appearance; though, in the distance, the lofty top and horizontal boughs sometimes stand out in most picturesque relief above the rounded summits of the neighboring trees. The silver fir flourishes in a deep loamy soil, and will grow even upon stiff clay, when well drained—a situation in which few conifers will succeed. On such lands, where otherwise desirable, it may sometimes be planted with profit. The cones do not ripen till the second year.

The Silver Fir of Canada (*P. balsamea*), a small tree resembling the last species in foliage, furnishes the "Canada balsam" used in medicine, and highly valued by the microscopist as a "mounting" medium. It is obtained from natural swellings or receptacles in the bark, like the resin of the common silver fir. The tree abounds in Lower Canada and the adjacent provinces.

Numerous other firs are common in gardens and shrubberies, and some furnish valuable products in their native countries; but they are not yet of sufficient economic or general interest to demand mention here. (C. P. J.)

FIRDOUSÍ. Abu 'l Cásim Mansúr who took the *nom de plume* of Firdousí, was a Persian poet of great eminence, and is chiefly known to European readers by his magnificent epic poem the *Shahnamah*, or "Book of Kings," a complete history of Persia in nearly 60,000 verses. He was born at Shadab, a suburb of Tús, about the year 329 of the Hegira (941 A.D.). His father, Maulana Ahmed, son of Maulana Fakhr-ed-dín el Firdousí, belonged to the class of *Dihkans* (the old native country families and landed proprietors of Persia, who had preserved their influence and status under the Arab rule), and possessed an estate in the neighborhood of Tús. Firdousí's own education eminently qualified him for the gigantic task which he subsequently undertook, for he was profoundly versed in the Arabic language and literature, and had also studied deeply the Pehlavi or Old Persian, and was conversant with the ancient historical records which existed in that tongue. As his history is intimately connected with that of the grand epic which he composed, it will be necessary to say a few words concerning the origin of the latter and the nature of the authorities from which it was compiled.

An epic poem, properly so called, is a collection of the ballads and songs, in which the memory of heroic deeds is always preserved in the earlier periods of a people's history, thrown by the rhapsodists into a connected and consecutive form. To become national and to take hold on the people's hearts it must contain nothing but the genuine national legends and traditions, and must have grown spontaneously. Many attempts have been made by poets of different nations to create a national epic, but they have always failed for the lack of the elements above referred to. Homer's *Iliad* and Virgil's *Æneid* are typical specimens of the real and spurious epic,—the former breathing in every line the true spirit of the Hellenic nation, and always rousing the national enthusiasm and appealing to the national feeling; the latter never having been regarded by the Latin race with any deeper feeling than that of admiration for its literary merits. The *Shahnamah* of Firdousí is perhaps the only exception of a poem produced by a single author, and at once taking its place as the national epic of the people. The nature of the work, the materials from which it was composed, and the circumstances under which it was written are, however, in themselves exceptional, and necessarily tended to this result. The grandeur and antiquity of the empire and the vicissitudes through which it passed, their long series of wars and the magnificent monuments erected by their ancient sovereigns, could not fail to leave numerous traces in the memory of so imaginative a people as the Persians.

As early as the 5th century of the Christian era we find mention made of these historical traditions in the work of an Armenian author, Moses of Khorene. During the reign of Naushirwan, the contemporary of Mahomet, and by order of that monarch, an attempt had been made to collect, from various parts of the kingdom, all the popular tales and legends relating to the ancient kings, and the results were deposited in the royal library. Under the last sovereign of the Sassanian dynasty, Yezdegird, the work was resumed, the former collection being revised and greatly added to by the Dihkan Danishwer, assisted by several learned mobeds. His work was entitled the *Khodai-nameh*, which in the old dialect also meant the "Book of Kings." On the Arab invasion this work was in great danger of perishing at the hands of the iconoclastic caliph Omar and his generals, but it was fortunately preserved; and we find it in the 2d century of the Hegira being paraphrased in Arabic by Abdallah ibn el Mokaffa, a learned Persian who had embraced Islam. Other Guebres occupied themselves privately with the collection of these traditions; and, when a prince of Persian origin, Yakúb ibn Leith, founder of the Soffaride dynasty, succeeded in throwing off his allegiance to the caliphate, he at once set about continuing the work of his illustrious predecessors. His "Book of Kings" was completed in the year 260 of the Hegira, and was freely circulated in Khorassan and Irak. Yakúb's family did not continue long in power; but the Samanian princes, descendants of the Sassanians, who succeeded them, applied themselves zealously to the same work, and entrusted it to the poet Dakiki himself, a Guebre by religion. Dakiki's labors were brought to a sudden stop by his own assassination, and the fall of the Samanian house happened not long after, and their kingdom passed into the hands of the Ghaznavides. Mahmúd ibn Sebuktagin, the second of the dynasty (667–1030 A.D.), continued to make himself still more independent of the caliphate than his predecessors, and, though a warrior and a fanatical Moslem, extended a generous patronage to Persian literature and learning, and even developed it at the expense of the Arabic institutions. The task of continuing and completing the collection of the ancient historical traditions of the empire especially attracted him. With the assistance of neighboring princes and of many of the influential Dihkans, Mahmud collected a vast amount of materials for the work, and after having searched in vain for a man of sufficient learning and ability to edit them faithfully, and having entrusted various episodes for versification to the numerous poets whom he had gathered round him, he at length made choice of Firdousí. Firdousí had been always strongly attracted by the ancient Pehlavi records, and had begun at an early age to turn them into Persian epic verse. On hearing of the death of the poet Dakiki, he conceived the ambitious design of himself carrying out the work which the latter had only just commenced; and, although he had not then any introduction to the court, he contrived, thanks to one of his friends, Mohammed Lashkari, to procure a copy of the Dihkan Danishwer's collection, and at the age of thirty-six commenced his great undertaking. Abu Mansour, the governor of Tús, patronized him and encouraged him by substantial pecuniary support. When Mahmud succeeded to the throne, and evinced such active interest in the work, Firdousí was naturally attracted to the court of Ghaznin. At first court jealousies and intrigues prevented Firdousí from being noticed by the sultan; but at length one of his friends, Mahek, undertook to present to Mahmud his poetic version of one of the well-known episodes of the legendary history. Hearing that the poet was born at Tús, the sultan made him explain the origin of his native town, and was much struck with the intimate knowledge of ancient history which he displayed. Being presented to the seven poets who were then engaged on the projected epic, Abu 'l Cásim was admitted to their meetings, and on one occasion improvised a verse, at Mahmud's request, in praise of his favorite Ayáz, with such success that the sultan bestowed upon him the name of Firdousí, saying that he had converted his assemblies into paradise (*Firdous*). During the early days of his sojourn at court, an incident happened which contributed in no small measure to the realization of his ambition. Three of the seven poets were drinking in a garden when Firdousí approached, and wishing to get rid of him without rudeness, they informed him who they were, and told him that it was their custom to admit none to their society but such as could give proof of poetical talent. To test his acquirements they proposed that each should furnish an extemporary line of verse, his own to be the last, and all three ending in the same rhyme. Firdousí accepted the challenge, and the three poets having previously agreed upon three rhyming words to which a fourth could not be found in the Persian language, 'Ansari began—

> Thy beauty eclipses the light of the sun;

Farrakhi added—

> The rose with thy cheek would comparison shun;

'Asjadi continued—

> Thy glances pierce through the mailed warrior's johsun ;[1]

and Firdousí, without a moment's hesitation, completed the quatrain—

> Like the lance of fierce Giv in his fight with Poshun.

The poets asked for an explanation of this allusion, and Firdousí recited to them the battle as described in the *Shahnamah*, and delighted and astonished them with his learning and eloquence.

Mahmud now definitely selected him for the work of compiling and versifying the ancient legends, and bestowed upon him such marks of his favor and munificence as to elicit from the poet an enthusiastic panegyric, which is inserted in the preface of the *Shahnamah*, and forms a curious contrast to the bitter satire which he subsequently prefixed to the book. The sultan ordered his treasurer, Khojah Hasan Meimendi, to pay to Firdousí a thousand gold pieces for every thousand verses; but the poet preferred allowing the sum to accumulate till the whole was finished, with the object of amassing sufficient capital to construct a dike for his native town of Tús, which suffered greatly from defective irrigation, a project which had been the chief dream of his childhood. Owing to this resolution, and to the jealousy of Hasan Meimendi, who often refused to advance him sufficient for the necessaries of life, Firdousí passed the later portion of his life in great privation, though enjoying the royal favor and widely extended fame. Amongst other princes whose liberal presents enabled him to combat his pecuniary difficulties, was one Rustem, son of Fakhr ed dauleh, the Deilamite, who sent him a thousand gold pieces in acknowledgment of a copy of the episode of Rustem and Isfendiar which Firdousí had sent him, and promised him a gracious reception if he should ever come to his court. As this prince belonged, like Firdousí, to the Shiah sect, while Mahmud and Meimendi were Sunnites, and as he was also politically opposed to the sultan, Hasan Meimendi did not fail to make the most of this incident, and accused the poet of disloyalty to his sovereign and patron, as well as of heresy. Other enemies and rivals also joined in the attack, and for some time Firdousí's position was very precarious, though his pre-eminent talents and obvious fitness for the work prevented him from losing his post. To add to his troubles he had the misfortune to lose his only son at the age of 37.

At length the book was completed, and Firdousí entrusted it to Ayáz, the sultan's favorite, for presentation to him. Mahmud ordered Hasan Meimendi to take the poet as much gold as an elephant could carry, but the jealous treasurer persuaded the monarch that it was too generous a reward, and that an elephant's load of silver would be sufficient. 60,000 silver dirhems were accordingly placed in sacks, and taken to Firdousí by Ayáz at the sultan's command, instead of the 60,000 gold pieces, one for each verse, which had been promised. The poet was at that moment in the bath, and seeing the sacks, and believing that they contained the expected gold, received them with great satisfaction, but finding only silver he complained to Ayáz that he had not executed the sultan's order. Ayáz related what had taken place between Mahmud and Hasan Meimendi, and Firdousí in a rage gave 20 thousand pieces to Ayáz himself, the same amount to the bath-keeper, and paid the rest to a beer seller for a glass of beer (*fouka*), sending word back to the sultan that it was not to gain money that he had taken so much trouble. On hearing this message, Mahmud at first reproached Hasan with having caused him to break his word, but the wily treasurer succeeded in turning his master's anger upon Firdousí to such an extent that he threatened that on the morrow he would "cast that Carmathian (heretic) under the feet of his elephants." Being apprised by one of the nobles of the court of what had taken place, Firdousí passed the night in great anxiety; but passing in the morning by the gate that led from his own apartments into the palace, he met the sultan in his private garden, and succeeded by humble apologies in appeasing his wrath. He was, however, far from being appeased himself, and determined at once upon quitting Ghaznin. Returning home he tore up the draughts of some thousands of verses which he had composed and threw them in the fire, and repairing to the grand mosque of Ghaznin he wrote upon the walls, at the place where the sultan was in the habit of praying, the following lines:—

"The auspicious court of Mahmud, king of Zabulistan, is like a sea. What a sea! One cannot see its shore. If I have dived therein without finding any pearls it is the fault of my star and not of the sea."

He then gave a sealed paper to Ayáz, begging him to hand it to the sultan in a leisure moment after 20 days had elapsed, and set off on his travels with no better equipment than his staff and a dervish's cloak. At the expiration of the 20 days Ayáz gave the paper to the sultan, who on opening it found the celebrated satire which is now always prefixed to copies of the *Shahnamah*, and which is perhaps one of the bitterest and severest pieces of reproach ever penned. Mahmud, in a violent rage, sent after the poet, and promised a large reward for his capture, but he was already in comparative safety. Firdousí directed his steps to Mazenderan, and took refuge with Kabous, prince of Jorján, who at first received him with great favor, and promised him his continued protection and patronage; learning, however, the circumstances under which he had left Ghaznin, he feared the resentment of so powerful a sovereign as Mahmud, who he knew already coveted his kingdom, and dismissed the poet with a magnificent present. Firdousí next repaired to Baghdad, where he made the acquaintance of a merchant, who introduced him to the vizier of the caliph, El Cader Billah, by presenting an Arabic poem which the poet had composed in his honor. The vizier gave Firdousí an apartment near himself, and related to the caliph the manner in which he had been treated at Ghaznin. The caliph summoned him into his presence, and was so much pleased with a poem of a thousand couplets, which Firdousí composed in his honor, that he at once received him into favor. The fact of his having devoted his life and talents to chronicling the renown of fire-worshipping Persians was, however, somewhat of a crime in the orthodox caliph's eyes; in order, therefore, to recover his prestige, Firdousí composed another poem, of 9000 couplets, on the theme borrowed from the Koran of the loves of Joseph and Potiphar's wife—*Yúsuf and Zuleikha*. This poem, though rare and little known, is still in existence—the Royal Asiatic Society possessing a copy. But Mahmud had by this time heard of his asylum at the court of the caliph, and wrote a letter menacing his liege lord, and demanding the surrender of the poet. Firdousí, to avoid further troubles, departed for Ahwaz, a province of the Persian Irak, and dedicated his *Yúsuf and Zuleikha* to the governor of that district. Thence he went to Kohistan, where the governor, Nasir Lek, was his intimate and devoted friend, and received him with great ceremony upon the frontier. Firdousí confided to him that he contemplated writing a bitter exposition of his shameful treatment at the hands of the sultan of Ghaznin; but Nasir Lek, who was a personal friend of the latter, dissuaded him from his purpose, but himself wrote and remonstrated with Mahmud. Nasir Lek's message and the urgent representations of Firdousí's friends had the desired effect; and Mahmud not only expressed his intention of offering full reparation to the poet, but put his enemy Meimendi to death. The change, however, came too late; Firdousí, now a broken and decrepit old man, had in the meanwhile returned to Tús, and, while wandering through the streets of his native town, heard a child lisping a verse from his own satire, in which he taunts Mahmud with his slavish birth:—

> "Had Mahmud's father been what he is now
> A crown of gold had decked this aged brow;
> Had Mahmud's mother been of gentle blood,
> In heaps of silver knee-deep had I stood."

He was so affected by this proof of universal sympathy with his misfortunes that he went home, fell sick, and died. He was buried in a garden, but Aboul Casim Gourgani, chief sheikh of Tús, refused to read the usual prayers over his tomb, alleging that he was an infidel, and had devoted his life to the glorification of fire-worshippers and misbelievers. The next night, however, having dreamt that he beheld Firdousí in paradise dressed in the sacred color, green, and wearing an emerald crown, he reconsidered his determination; and the poet was henceforth held to be perfectly orthodox. He died in the year 411 of the Hegira (1020 A.D.), aged about eighty, eleven years after the completion of his great work. Mahmud had in the meanwhile despatched the promised hundred thousand pieces of gold to Firdousí, with a robe of honor and ample apologies for the past. But as the camels bearing the treasure reached one of the gates of the city, Firdousí's funeral was leaving it by another. His daughter, to whom they brought the sultan's present, refused to receive it; but, his aged sister remembering his anxiety for the construction of the stone embankment for the river of Tús, this work was completed in honor of the poet's memory, and a large caravanserai built with the surplus.

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[1] A sort of cuirass.

The *Shahnamah* is based, as we have seen, upon the ancient legends current among the populace of Persia, and collected by the Dihkans, a class of men who had the greatest facilities for this purpose. There is every reason to believe that Firdousí adhered faithfully to these records of antiquity, and that the poem is a perfect storehouse of the genuine traditions of the country. Among much that is marvellous or incongruous, therefore, we may fairly look for the records of real events; and there is no doubt that, studied by the light of modern criticism, the volume will prove of great service and interest to future historians and ethnologists.

The entire poem has been published with a French translation in a magnificent folio edition, at the expense of the French Government, by the late learned and indefatigable Jules de Mohl. The size and number of the volumes, however, and their great expense, make them difficult of access, while the original Persian, though easily procurable, is of course a sealed book to the majority of European readers. To supply this defect, Madame de Mohl has published in a cheap and convenient form the French translation, with her illustrious husband's critical notes and introduction. This will henceforth be the standard work on the subject, containing as it does a *résumé* of everything that has ever been written on the *Shahnamah*, or which can elucidate its contents. It is published at the "Imprimerie Nationale," Paris, under title of *Le Livre des Rois, par Abou'l Kasim Firdousí, traduit et commenté par Jules Mohl, Membre de l'Institut, Professeur au Collége de France; publié par Mme. Mohl*, Paris, 1876-7. (E. H. P.)

FIRE. So general is the knowledge of fire and its uses that it is a question whether we have any authentic instance on record of a tribe altogether ignorant of them. A few notices indeed are to be found in the voluminous literature of travel which would decide the question in the affirmative; but when they are carefully investigated, their evidence is found to be far from conclusive. The missionary Krapf was told by a slave of a tribe in the southern part of Shoa who lived like monkeys in the bamboo jungles, and were totally ignorant of fire; but no better authority has been found for the statement, and the story, which seems to be current in Eastern Africa, may be nothing else than the propagation of fables about the Pygmies whom the ancients located around the sources of the Nile. Commodore Wilkes, commander of the United States exploring expedition, says that in Fakaafo or Bowditch Island "there was no sign of places for cooking nor any appearance of fire," and that the natives felt evident alarm at the sparks produced by flint and steel and the smoke emitted by those with cigars in their mouths. The presence of the word *afi*, fire, in the Fakaafo vocabulary supplied by Hales the ethnographer of the expedition, though it might perhaps be explained as equivalent only to solar light and heat, undoubtedly invalidates the commodore's supposition; and the Rev. George Turner, in an account of a missionary voyage in 1859, not only repeats the word *afi* in his list for Fakaafo, but relates the native legend about the origin of fire, and describes some peculiar customs connected with its use. Alvaro de Saavedra, an old Spanish traveller, informs us that the inhabitants of Los Jardines, an island of the Pacific, showed great fear when they saw fire,—which they did not know before. But that island has not been identified with certainty by modern explorers. It belongs, perhaps, to the Ladrones or Marianas Archipelago, where fire was unknown, says Padre Gobien, "till Magellan, wroth at the pilferings of the inhabitants, burnt one of their villages. When they saw their wooden huts ablaze, their first thought was that fire was a beast which eats up wood. Some of them having approached the fire too near were burnt, and the others kept aloof, fearing to be torn or poisoned by the powerful breath of that terrible animal." To this Freycinet objects that these Ladrone islanders made pottery before the arrival of Europeans, that they had words expressing the ideas of flame, fire, oven, coals, roasting, and cooking. Let us add that in their country numerous graves and ruins have been found, which seem to be remnants of a former culture. Thus the question remains in uncertainty: though there is nothing impossible in the supposition of the existence of a fireless tribe, it cannot be said that such a tribe has been discovered.

It is useless to inquire in what way man first discovered that fire was subject to his control, and could even be called into being by appropriate means. With the natural phenomenon and its various aspects he must soon have become familiar. The volcano lit up the darkness of night and sent its ashes or its lava down into the plains; the lightning or the meteor struck the tree, and the forest was ablaze; or some less obvious cause produced some less extensive ignition. For a time it is possible that the grand manifestations of nature aroused no feelings save awe and terror; but man is quite as much endowed with curiosity as with reverence or caution, and familiarity must ere long have bred confidence if not contempt. It is by no means necessary to suppose that the practical discovery of fire was made only at one given spot and in one given way; it is much more probable indeed that different tribes and races obtained the knowledge in a variety of ways. We still find in different parts of the world the natives taking advantage of hot springs, naphtha or petroleum wells, and accessible craters. In the island of Tanna, for instance, there is a mountain to the west of Port Resolution which abounds in evidence of its volcanic character—in fissures, steam-jets, hot-springs, etc. The inhabitants, says the Rev. George Turner, have not the slightest apprehension of danger; their settlements are arranged so that their *murum* or public square occupies one of the "hot places of the mountain; and there they lounge and enjoy the subterranean heat. Some of the springs reach the boiling point. Every day women may be seen cooking vegetables in artificial pits which form a series of never failing boiling pots. In some places the men or boys have only to stand on the rocks, spear their fish, and pitch them behind into the hot springs." Similar accounts are given of the Maories in New Zealand, and the Negritos in the New Hebrides.

It has been asserted of many tribes that they would be unable to rekindle their fires if they were all allowed to die out. Travellers in Australia and Tasmania depict the typical native woman bearing always about with her a burning brand, which it is one of her principal duties to protect and foster; and it has been supposed that it was only ignorance which imposed on her the endless task. This, however, is not so certain; for Mr. Miklucho Maclay remarks of the Papuans, whom he has closely studied, that though they know how to produce fire, they prefer to carry it about. It was one of the distinguishing marks of the Samoan noble that his fire was never permitted to go out; and his attendants had a special name from their business of watching it while he slept. In Corea the preservation of the ancestral fire is still regarded as of the first importance for the happiness of a family, and the same belief has had a very extensive sway in other parts of the world.

The methods employed for producing fire vary considerably in detail, but are for the most part merely modified applications of concussion or friction. Sir John Lubbock has remarked that the working up of stone into implements must have been followed sooner or later by the discovery of fire; for in the process of chipping sparks were elicited, and in the process of polishing heat was generated. The first or concussion method is still familiar in the flint and steel, which has hardly passed out of use even in the most civilized countries. Its modifications are comparatively few and unimportant. The Alaskans and Aleutians take two pieces of quartz, rub them well with native sulphur, strike them together till the sulphur catches fire, and then transfer the flame to a heap of dry grass over which a few feathers have been scattered. Instead of two pieces of quartz the Eskimos use a piece of quartz and a piece of iron pyrites. Mr. Frederick Boyle saw fire produced by striking broken china violently against a bamboo, and Bastian observed the same process in Burmah, and Wallace in Ternate. In Cochin China two pieces of bamboo are considered sufficient, the silicious character of the outside layer rendering it as good as native flint. The friction methods are more various. One of the simplest is what Mr. Tylor calls the stick and groove—"a blunt pointed stick being run along a groove of its own making in a piece of wood lying on the ground." Much, of course, depends on the quality of the woods and the expertness of the manipulator. In Tahiti Mr. Darwin saw a native produce fire in a few seconds, but only succeeded himself after much labor. The same device was employed in New Zealand, the Sandwich Islands, Tonga, Samoa, and the Radack islands. Instead of rubbing the movable stick backwards and forwards other tribes make it rotate rapidly in a round hole in the stationary piece of wood—thus making what Mr. Tylor has happily designated a fire-drill. This device has been observed in Australia, Kamchatka, Sumatra, and the Carolines, among the Veddahs of Ceylon, throughout a great part of Southern Africa, among the Eskimo and Indian tribes of North America, in the West Indies, in Central America, and as far south as the Straits of Magellan. It was also employed by the ancient Mexicans, and Mr. Tylor gives a quaint picture of the operation from a Mexican MS.,—a man half kneeling on the ground is causing the stick to rotate between the palms of his hands. This simple method of rotation seems to be very generally in use; but various devices have been resorted to for the purpose of diminishing the labor and hastening the result. The Gaucho of the Pampas takes "an elastic stick about 18 inches long, presses one end to his breast and the other in a hole in a piece of wood, and then rapidly turns the curved part like a carpenter's centre-bit." In other cases the rotation is effected by means of a cord or thong wound round the drill and pulled alternately by this end and that. In order to steady the drill the Eskimo and others put the upper end in a socket of ivory or bone which they hold firmly in their mouth. A further advance was made by some of the North American Indians, who appear to have applied the principle of the bow-drill; and the still more ingenious pump-drill was used by the Iroquois Indians. For full descriptions of these instruments and a rich variety of details connected with fire-making we must refer the reader to Mr. Tylor's valuable chapter in his *Researches.* These methods of producing fire are but rarely used in Europe, and only in connection with superstitious observances. We read in Wuttke that some time ago the authorities of a Mecklenburg village ordered a "wild fire" to be lit against a murrain amongst the cattle. For two hours the men strove vainly to obtain a spark, but the fault was not to be ascribed to the quality of the wood, or to the dampness of the atmosphere, but to the stubbornnesss of an old lady, who, objecting to the superstition, would not put out her night lamp; such a fire, to be efficient, must burn alone. At last the strong-minded female was compelled to give in; fire was obtained,—but of bad quality, for it did not stop the murrain.

It has long been known that the rays of the sun might be concentrated by a lens or concave mirror. Aristophanes mentions the burning-lens in *The Clouds*, and the story of Archimedes using a mirror to fire the ships at Syracuse is familiar to every schoolboy. If Garcilasso de la Vega can be trusted as an authority, the Virgins of the Sun in Peru kindled the sacred fire with a concave cup set in a great bracelet. In China the burning-glass is in common use.

To the inquiry how mankind became possessed of fire, the cosmogonies, those records of pristine speculative thought, do not give any reply which would not be found in the relations of travellers and historians.

They say in the Tonga Islands that the god of the earthquakes is likewise the god of fire. At Mangaïa it is told that the great Maui went down to hell, where he surprised the secret of making fire by rubbing two pieces of wood together. The Maories tell the tale differently. Maui had the fire given to him by his old blind grandmother, Mahuika, who drew it from the nails of her hands. Wishing to have a stronger one, he pretended that it had gone out, and so he obtained fire from her great toe. It was so fierce that everything melted before the glow; even Maui and the grandmother herself were already burning when a deluge, sent from heaven, saved the hero and the perishing world; but before the waters extinguished all the blaze, Mahuika shut a few sparks into some trees, and thence men draw it now. The Maories have also the legend that thunder is the noise of Tawhaki's footsteps, and that lightnings flash from his armpits. At Western Point, Victoria, the Australians say the good old man Pundyil opened the door of the sun, whose light poured then on earth, and that Karakorok, the good man's good daughter, seeing the earth to be full of serpents, went everywhere destroying serpents; but before she had killed them all, her staff snapped in two, and while it broke, a flame burst out of it. Here the serpent-killer is a fire-bringer. In the Persian *Shahnamah* also fire was discovered by a dragon-fighter. Hushenk, the powerful hero, hurled at the monster a prodigious stone, which, evaded by the snake, struck a rock and was splintered by it. "Light shone from the dark pebble, the heart of the rock flashed out in glory, and fire was seen for the first time in the world." The snake escaped, but the mystery of fire had been revealed.

North American legends narrate how the great buffalo, careering through the plains, makes sparks flit in the night, and sets the prairie ablaze by his hoofs hitting the rocks. We meet the same idea in the Hindu mythology, which conceives thunder to have been, among many other things, the clatter of the solar horses on the Akmon or hard pavement of the sky. The Dakotas claim that their ancestor obtained fire from the sparks which a friendly panther struck with its claws, as it scampered upon a stony hill. Tohil, who gave the Quiches fire by shaking his sandals, was, like the Mexican Quetzelcoatl, represented by a flint stone. Guamansuri, the father of the Peruvians, produced the thunder and the lightning by hurling stones with his sling. The thunderbolts are his children. Kudai, the great god of the Altaian Tartars, disclosed "the secret of the stone's edge and the iron's hardness." The Slavonian god of thunder was depicted with a silex in his hand, or even protruding from his head. The Lapp Tiermes struck with his hammer upon his own head; the Scandinavian Thor held a mallet in one hand, a flint in the other. Taranis, the Gaul, had upon his head a huge mace surrounded by six little ones. Finnish poems describe how "fire, the child of the sun, came down from heaven, where it was rocked in a tub of yellow copper, in a large pail of gold." Ukko, the Esthonian god, sends forth lightnings, as he strikes his stone with his steel. According to the Kalewala, the same mighty Ukko struck his sword against his nail, and from the nail issued the "fiery babe." He gave it to the Wind's daughter to rock it, but the unwary maiden let it fall in the sea, where it was swallowed by the great pike, and fire would have been lost for ever, if the child of the sun had not come to the rescue. He dragged the great pike from the water, drew out his entrails, and found there the heavenly spark still alive. Hephæstus also, the Greek fire-god, fell from heaven into the sea of Lemnos. Prometheus brought to earth the torch he had lighted at the sun's chariot.

Human culture may be said to have begun with fire, of which the uses increased in the same ratio as culture itself. To save the labor expended on the initial process of procuring light, or on carrying it about constantly, primitive men hit on the expedient of a fire which should burn night and day in a public building. The Egyptians had one in every temple, the Greeks, Latins, and Persians in all towns and villages. The Natchez, the Mexicans, the Mayas, the Peruvians, had their "national fires" burning upon large pyramids. Of these fires the "eternal lamps" in the synagogues, in the Byzantine and Catholic churches, may be a survival. The "Regia," Rome's sacred centre, supposed to be the abode of Vesta, stood close to a fountain; it was convenient to draw from the same spot the two great requisites, fire and water. All civil and political interests grouped themselves around the Prytaneion, which was at once a temple, a tribunal, a town-hall, and a gossiping resort; all public business and most private affairs were transacted by the light and in the warmth of the common fire. No wonder that its flagstones should become sacred. Primitive communities consider as holy everything that ensures their existence and promotes their welfare, material things such as fire and water not less than others. Thus the Prytaneion grew into a religious institution. And if we hear a little more of fire worship than of water worship, it is because fire, being on the whole more difficult to obtain, was esteemed more precious.

We have curious and concordant testimonies that the principal functions of the state itself grew out of the care which was bestowed on the tribal fire. The men who attended it in Hellas were called the Prytanes. They had to eat together, and it would have been considered as a bad omen if they had neglected that duty. They were fed at the public expense; and well they might be, for having been, probably, general cooks at the outset, they became, when the city was established, *Archontes* or magistrates, and even *Basileis*, or a combination of the captain, the priest, and the king. Thus the first guardians of the tribal fire were the earliest public servants, who by degrees appropriated all important offices, as the state itself developed into a vast aggregation of interests. And when Augustus usurped the Roman empire, he assumed all the powers which a pristine board of flamens, or of Prytanes, may have possessed. He made himself *Pontifex Maximus*, and assumed the charge of the public fire; and on transporting it to his own palace, he had to convert it into public property. The Hellenic nations, as well as the Aztecs, received ambassadors in their temples of fire, where, as at the national hearth, they feasted the foreign guests. The Prytaneion and the state were convertible terms. If by chance the fire in the Roman temple of Vesta was extinguished, all tribunals, all authority, all public or private business, had to stop immediately. The connection between heaven and earth had been broken, and it had to be restored in some way or other,—either by Jove sending down divine lightning on his altars, or by the priests making a new fire by the old sacred method of rubbing two pieces of wood together, or by catching the rays of the sun in a concave mirror. No Greek or Roman army crossed the frontier without carrying an altar where the fire taken from the Prytaneion burned night and day. When the Greeks sent out colonies the emigrants took with them living coals from the altar of Hestia, and had in their new country a fire lit as a representative of that burning in the mother country.[1] Not before the three curiæ united their fires into one could Rome become powerful; and Athens became a shining light to the world only, we are told, when the twelve tribes of Attica, led by Theseus, brought each its brand to the altar of Athene Polias. All Greece confederated, making Delphi its central hearth; and the islands congregated around Delos, whence the new fire was fetched every year.

According to a not impossible theory, all architecture, public and private, sacred and profane, began with the erection of sacred sheds to protect the sacred fire, which abodes men dared to inhabit only after a length of time. For it must be borne in mind that fire was looked upon as a divinity. We are expressly told that Vesta had no image or statue even in her own temple, the Vestal fire being considered as the very goddess herself. The husbandmen who ate their repast before the hearth believed, as Ovid relates, that they sat in the presence of the gods themselves. The hearth fire was kept holy, its flame was to remain bright and pure. The minute and irksome prescriptions of the Zend-Avesta carried this feeling to the extreme: it was and it is still a widely spread belief that nothing unclean is to be thrown in the fire, that no indecent actions are to be committed before it. To spit in one's fire would be now considered in many places, in Albania, for example, as an unpardonable offence. The Galtchas of Ferghana, according to M. de Ujfalvy, are so reverential that they would not blow out a light lest they should render the flame impure with their breath; and a similar peculiarity was observed by Wood in Badakshan and by Khanikoff among the Tadjiks of Bokhara.[2]

In the course of time, the same reasons which made the tribe provide itself with a permanent fire made every family have its hearth. It would even be more accurate to say that the family, as it is called now-a-days, developed itself after the human couple and their children had their own fire-place, and not before. It is likely that at the outset only the higher aristocracy of chieftains, *eumetrides* or *eupatrides*, were allowed to have a fire of their own, which was then equivalent to a private or family god. They kept it burning night and day all the year round. As recently as the last generation, fires of such a character were rather numerous in the northern countries.[3]

These lingering customs take us back to the time when every hearth was an altar. From the national Prytaneion a brand was given to each gens. When gentes grew out of the tribe, and subsequently when families grew out of the gentes, coals from the gentile sacrificial stone were given to every family. These three social organisms, the nation, the gens, the family, one merging into another, had fire for their common symbol, and esteemed it as even the cause of their existence. The hearth was the very centre of the house, as the regia was the sacred centre of Rome and the Roman commonwealth; around the regia the civic and politic institutions developed themselves, and around the hearth the family grew slowly into shape and power.

As already observed, the Prytaneion was an altar to the genius of the commonwealth, the abode of the nation's heroic ancestors. Its exact counterpart was the gentile hearth, owned by the gens at large and its dependent families. When the gentes broke asunder, every family became possessed likewise of an altar to its particular "Penates" and "Lares," or sacred fathers. These fathers were not mere ancestors, or grandparents, as we hold them now to be, but the constant progenitors; not only were they believed to have begotten children in a former age, but also to go on begetting them constantly through succeeding generations. Procreators and protectors as well, they were the source of blessing at the same time as the source of existence. Called gods, "*theoi patrooi, genethlioi, engeneis, sunaimoi,*" they were in fact the gods of the household, but gods of the same kin and blood as their descendants. No oath was held more sacred than the one which a man swore by his own hearth,—no prayer more readily granted than that which was coupled with a wish for the welfare of the hearth. The hearth had a recognized right of asylum, which is yet in full vigor in many countries. But it was above all the throne of the "paterfamilias," the stronghold of his dominion. The proud saying of the Englishman that his home is his castle is but an attenuated remnant of the feeling which animated the chiefs of the Vedic, the Greek, and the Italian gentes. Such a man was the king absolute over his household; he wielded the power of life and death over all his subordinates, cattle, slaves, children, wife or wives; he was the priest of his altar, the manager and expounder of all divine things, elevated above the standard of common mortals. He alone in his kingdom could, if need were, make a new fire, not with a vulgar flint and iron, but by the solemn mode of rubbing together two sacred twigs. In this way all Greek hearths were provided with new fires when the ancient ones had been sullied by the look of the hated Persian invaders. Beside the hearth, the second place, at least, was due to the wife and mother; and as time went on her influence continued to increase.[4]

Identity of Fire and Soul in Ancient Belief.—The sun, as the source of heat, gives life to earth; and it was natural to suppose that the hearth, "the sun in the house," as the younger Edda calls it, radiated life likewise. Therefore it was made the seat of the Lares and Penates, or ancestors, a dwelling-place for the deceased, where a stock of souls ready to enter existence by new births was maintained. The famous Roman legend of Servius Tullius, whom Plutarch and other writers report to have been procreated in the ashes of the hearth by the Lares themselves, is a curious illustration of this belief. A sepulchral picture at Orvieto represents a double phallus protruding from the flame of a hearth, on which a libation is being poured. The Vedas taught that the hearth-fire was cosubstantial with the cause of generation. Hence care was taken to preserve the purity of descent in the kin by preserving the flame of the hearth pure and unmingled with fire taken from another house. On this matter the ancient Persians were particularly punctilious, feeding their fires, and especially their sacred fires, only with certain kinds of wood, reputed to be cleaner than all others, well dried, and well stript of the bark. Everywhere and in all countries, it was considered a most fatal omen if the fire died out in the hearth. The family whose fire went out had incurred the ire of the Lares, who, if not quickly appeased, would strike the sons with impotence and imbecility. A new fire was to be lit by the friction of two twigs, as to fetch some from a neighbor's would have been considered an adulterous union of hearths, an undue mingling of two families' blood.[1]

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[1] Curiously enough, we see the same institution obtaining among the Damaras of South Africa, where the chiefs, who sway their people with a sort of priestly authority, commit to their daughters the care of a so-called eternal fire. From its hearth younger scions separating from the parent stock take away a burning brand to their new home. The use of a common Prytaneion, of circular form, like the Roman temple of Vesta, testified to the common origin of the North American Assinais and Maichas. The Mobiles, the Chippeways, the Natchez, had each a corporation of Vestals. If the Natchez let their fire die out, they were bound to renew it from the Mobiles. The Moquis, Pueblos, and Comanches had also their perpetual fires. The Red-skins discussed important affairs of state at the "council fires," around which each *sachem* marched three times, turning to it all the sides of his person. "It was a saying among our ancestors," said an Iroquois chief in 1753, "that when the fire goes out at Onondoga"—the Delphi of the league—"we shall no longer be a people."

[2] See *Bulletin de la Soc. de Géog.*, Paris, 1878, p. 489; Wood's *Journey to Source of Oxus*, 1872, p. 177.

[3] The rich Westphalian farmers have still between their habitation and the stables the so-called *Skorestein*, where burns a constant fire, for which they have a superstitious regard. On the banks of the Sieg it was the custom, as recently as the year 1855, to insert a large mass of oak, usually a stump with its roots, in a niche opposite the pot-hanger. The block smouldered slowly, and was intended to last the whole year, from Christmas to Christmas, when its remains were ground to powder and strewn on the fields to insure their fertility.

[4] The traveller Pallas was told by the Mongol populations which he visited that a woman might indulge in the vilest abuse and insult, and no one would dare to touch her, so long as she stood between the bed and the fire-place. In the Vedas we see that the new wife underwent some sort of consecration by walking thrice around the new hearth-place, and stretching her hand into the flames while she was being sprinkled over with lustral water. In Germany and Slav countries, the bride, as she comes from church and enters her new house, bows to the fire burning on the hearth, walks thrice round it, burns three of her hairs, and binds a red string round her body. What is no more done by the mistress is still done to her servants in Germany, who, as they come in, are made to run round the kitchen fire, are touched with soot, and have their bare feet sprinkled with ashes.

Resemblance between Fire-Production and Life-Production.—For a long time, throughout all the world, the ancient naturalists who meditated on the greatest wonder of physiology, supposed that the generation of fire by the friction of two woods, one of harder, the other of softer substance, was the exact counterpart of human generation. The heat thus evolved in the human organism was held to be of most subtle nature, a flash of the astral light, an intelligent substance. Primary fire impregnated primary water, and the soul was born. Life was compared to a flame, to a torch; and no comparison is more true. Modern chemistry having proved that animal life is a constant burning of oxygen, the ancient myth was not far from the truth when it said that Prometheus animated the figure of clay by putting into it a spark of fire. "Know ye," said an Ojibway prophet, "that the fire in your huts and the life in your bodies are one and the same thing." A torch which was put out by throwing it violently on the ground symbolized in ecclesiastical rites excommunication, or the condemnation of a soul to eternal death. In classical mythology, Meleager's life was bound to a log of wood; when the one was turned to a heap of ashes, the other was to fall dead. "*Corpus est terra, anima est ignis,*" that old piece of philosophy, became inseparable from poetry and language; and now, as in the days of yore, the soul and the "genius" are always spoken of as if they possessed the nature of flame, and the angels and the peris as if their substances were pure light. According to the pristine physiology, man was likewise a fire, but a fire hidden in clay, diluted in water. If it had not been for water, the flame would have been destroyed by its own force,—it would have blazed up, coruscating violently in dazzling effulgence, and then dying out. In fact, all primitive theories attributed to gaseous water the action which our present science attributes to nitrogen, without which oxidation would go on too rapidly to allow of the formation of oxidizable matter. Hence water was thought to be as necessary as fire itself; hence ancient law forbade the individuals guilty of offences against the commonwealth to have fire and water given them—a sentence equivalent to death. The mixture of organic fire and organic water in our bodies was compared to that in vegetable matter, which emits much smoke if burned when in green or wet condition. Nay, by pursuing the analysis of combustion in which the classical world had centred all its philosophy, the ashes or mineral detritus which fell on the hearth found their analogue in the flesh, in the bones, in the solid parts of our organism. Thus man was thought to be an alloy of fire, earth, and water in slightly different proportions. Fire, a constituent part of the divine intelligence, became a soul when it was immersed in organic water; it became the body when it was put into organic clay. The traditions of the Egyptian priesthood, which were current under the name of Hermes Trismegistus, teach that at the moment of death, "our intelligence, one of God's subtile thoughts, escapes the body's cross, puts on its fiery tunic again, and floats henceforth in space," leaving the soul to await judgment. Men were divided into noble and ignoble, according as the material or the spiritual side of their nature predominated. Thus a frequent distinction in the burials, which may have arisen even in prehistoric times, can be explained. Chiefs and kings, priests and noblemen, possessed all of a divine soul, were burned, flame going forth to flame; but people of the common sort were sunk among the sods, clay going back to clay.[2]

Cosmic Fire.—The opinions and beliefs which most primitive populations have entertained on the nature of fire in the hearth were applied by them to the great cosmic fire: both were life-givers, one to the family and the other to the universe; both were parts of the same substance or element. It was taught by Aristotle that Zeus was a name given to the fire of heaven, and by Plato and Euripides that the same Hestia burned in the humblest hut and the highest sky. Ovid went so far as to identify that goddess with the earth itself. According to that doctrine fire was held to be the very soul of nature, the essence of everything that had a shape, and even to be the giver of that shape, for philosophers explained that of all elements none but fire having any form by itself could impart it to other things. From Jupiter to the fly, from the wandering star to the tiniest blade of grass, all beings owed existence to the fiery element. This theory, more or less distinctly expressed, obtained among the Aztecs, who invoked in their prayers "fire the most ancient divinity, the father and mother of all gods." Tohil the Quiche, Quetzacoatl the Mexican, Tiermes the Finn, Perkun the Slav, Thor the Scandinavian, Taranis the Gaul, and many other gods, as stated above, were represented as having firestones for heads or for bodies; one of them was said to have flashed up in lightnings as he was dragged along the rocky heavens by some powerful antagonist. Such a god, encased in a shell of flint, fell down from heaven upon earth, according to an Indian legend; the shell broke into sixteen hundred fragments, and each of them arose and stood up as a particular god. From such a thunderbolt or meteorite the Dacotas boasted to have originated.

In the Gnostic theory the middle part of the cosmos was taken up by the starry world, emitting the astral light, inferior in sanctity to the mild effulgence of ether above it, but superior in vivifying properties to our common fires. These three conditions of the cosmic fire corresponded to the three component parts of man—mind, soul, and body. Prophets and other great and pious men had minds still refulgent with ethereal rays, which were the thoughts of divinity: while the wicked had souls which had been soaked in a smoky fire, and in stupid people there glimmered but the weakest possible ray of celestial light.

It was not the hottest fire which was supposed to be the most divine. Fierce heat being inimical to organic life, hot fires are said to be hellish ones. Their masters, the demons of drought and sterility, dry up the fountains, scorch the grass, excite pestilence, are the worst fiends to the human race. Pure light was thought to be without any heat at all, and legends tell of "theophanias," of aureoles, of fiery tongues flickering above the cradles of infants predestined to glorious careers. Phallic fire, giving out heat but no light, was often considered as of an inferior nature, and therefore represented by secondary or even by tertiary deities, fauns, satyrs, ægipans, and the like.

At the outset the gods and demons alike had some command of fire, but they were distinguishable by the nature of their fire. Among the Scandanavians, Woden was the fire that shines, Thor the lightning, and Loki the fire that burns and shall one day destroy the whole world; Brahma, Indra, Siwa, and Osiris, Horus, Typhon, had similar meanings. Zeus, Apollo, and Athene presided over the celestial flame; Hercules and Dionysus marked the progressive purifications of the terrestrial fire. Besides his influence over generation, Hephæstus had the command of the subterranean fire and of its vast smithies, where earths and stones were fused into metals. It was with a feeling of the most intense awe that the Vedic Aryans contemplated the thunderstorm and the lightning, the fierce struggle in the heavens, the fight between the winds and the clouds, between fire and water, between the fire-god Indra and Vritra the fire-dragon. So, likewise, the Iranians conceived of our world as the field of the great battle between Ormuzd the Increaser, and his twin brother Ahriman the Destroyer.

Healing and Purification by Fire.—The principle of life being a fiery one, it was supposed that all maladies were only so many defilements of the pure principle which had been darkened by the demons of night, and that all sick people were demoniacs. The traditions of the Finns assert that lightning, the fiery sword of Ukko, slays the demons of illness. But it was discovered that the exhibition of lightning, as a healing method, was attended with grave drawbacks: it was impossible to insure being able to use it, and when it could be obtained, the cure was worse than the disease, as the patient was killed before the imp who had bedeviled him. It became necessary to have recourse to a substitute; and therefore the healing virtues of the thunderbolt were embodied in the *Keraunia* or thunderstones. The "holy stones" of the Anglo-Saxons, or "holed stones," arrow heads, flint celts, and flint knives worked by prehistoric men, were popularly believed to be stones which falling down from heaven possessed heavenly virtues, and were of use in all sorts of disease.[1]

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[1] It is interesting to note that in Bohemia the country people have still a strong prejudice against any fire being taken to or taken from the hearth. Till the babe be forty days old, the Albanians do not allow a brand, not even a coal, from the family fire-place to be given away. As long as the Japanese had castes, people of the higher ranks ate no food except what was cooked in their own home, for fear of "mixing fire," evidently because they thought that fire imparted its nature to food, and by means of food to the bodily powers.

[2] So among Algonquins and Ottaways those only of the "Great Hare totem," among the Nicaraguans none but the "caciques," among the Caribs no others than the priestly caste, were entitled to the honor of cremation. The tribes of Upper California were even persuaded that such as were not burned were liable to be transformed into brutes. Among certain populations (as, for instance, the Colchians of old, and the Babeens or Chimpseyans of our times) the males had the privilege of the pyre, which was denied to women. The examples illustrating the belief of the soul being a fire are so numerous that it is difficult to choose among them. In Voigtland the souls of unchristened babes are believed to be turned into Wills-of-the-Wisp. The souls of dying men or beasts are said to burn sometimes with a heat so intense that their eyes inflame piles of wood. It is a frequent feat of divine horses in Tartar legends to make the rocks glow and melt as pitch by merely looking at them.

Sickness having become identified with sin, purification became the first and most esteemed of curative agents and of prophylactics. It needed to be undergone when a dead body had been touched or when women had been delivered. The mother walked with her babe through fires lit on her right hand and on her left; the infants, especially the males, were fumigated with great care. Among some populations none could approach mother and child without stepping over a brazier. Fiery ordeals heralded the attainment of the age of puberty by both sexes. Ambassadors were refused admittance to the presence of the sovereign until they had traversed a flame which should singe away the foreign devilries which they might carry about them.

Purification by fire led to the institution of baptism by fire, which in many places was thought vastly superior to baptism by water; and the idea obtained its furthest development in the notion of purgatorial fires, which is not peculiar to one church. Often people had misgivings about the penance which awaited them in a future state, and reckoned that it would be better for them to undergo it on this side of the grave.[2]

Periodic Fires.—Because the sun loses its force after noon, and after midsummer daily shortens the length of its circuit, the ancients inferred, and primitive populations still believe, that, as time goes on, the energies of fire must necessarily decline. Therefore men set about renewing the fires in the temples and on the hearth, on the longest day of summer or at the beginning of the agricultural year. The ceremony was attended with much rejoicing, banqueting, and many religious rites. Houses were thoroughly cleansed; people bathed, and underwent lustrations and purifications; new clothes were put on; quarrels were made up; debts were paid by the debtor or remitted by the creditor; criminals were released by the civil authorities in imitation of the heavenly judges, who were believed to grant on the same day a general remission of sins. All things were made new; each man turned over a new page in the book of his existence. Some nations, like the Etruscans in the Old World, and the Peruvians and Mexicans in the New, carried these ideas to a high degree of development, and celebrated with magnificent ceremonies the renewal of the *sæcula*, or astronomic periods, which might be shorter or longer than a century. Some details of the festival among the Aztecs have been preserved. On the last night of every period (52 years) every fire was extinguished, and men proceeded in solemn procession to some sacred spot, where, with awe and trembling, the priests strove to kindle a new fire by friction. It was as if they had a vague idea that the cosmos, with its sun, moon, and stars, had been wound up like a clock for a definite period of time. And had they failed to raise the vital spark, they would have believed that it was because the great fire was being extinguished at the central hearth of the world. The Stoics and many other ancient philosophers thought that the world was doomed to final extinction by fire. The Scandinavian bards sung the end of the world, how at last the wolf Fenrir would get loose, how the cruel fire of Loki would destroy itself by destroying everything. The Essenes enlarged upon this doctrine, which is also found in the Sibylline books and appears in the Apocrypha (2 Esdras xvi. 15).

See Dupuis, *Origine de tous les Cultes*, 1794; Bournouf, *Science des Religions*; Grimm, *Deutsche Mythologie*, cap. xx., 1835; Adalbert Kuhn, *Die Herabkunft des Feuers und des Göttertranks*, 1859; Steinthal, *Ueber die ursprüngliche Form der Sage von Prometheus*, 1861; Albert Reville, "Le Mythe de Prométhée," in *Revue des Deux Mondes*, August, 1862; Michel Bréal. *Hercule et Cacus*, 1863; Tylor, *Researches into the Early History of Mankind*, chap. ix., 1865; Bachofen, *Die Sage von Tanaquil*, 1870; Lubbock, *Prehistoric Times*, 3d edition, 1872; Haug, *Religion of the Parsis*, 1878. (E. RE.)

FIRE is considered in the present article in relation to the destruction by it of life and property. History is full of accounts of the devastation it has caused in the towns and cities of nearly every country of the civilized world. The following list embraces the most memorable of the great fires of which records have been preserved:—

GREAT BRITAIN AND IRELAND.

798. *London*, nearly destroyed.
982. “ greater part of the city burned.
1086. “ all houses and churches from the east to the west gate burned.
1212. “ greater part of the city burned.
1666. “ "The Great Fire," September 2–6.

It began in a wooden house in Pudding Lane, and burned for three days, consuming the buildings on 436 acres, 400 streets, lanes, etc., 13,200 houses, with St. Paul's church, 86 parish churches, 6 chapels, the guild-hall, the royal exchange, the custom-house, many hospitals and libraries, 52 companies' halls, and a vast number of other stately edifices, together with three of the city gates, four stone bridges, and the prisons of Newgate, the Fleet, and the Poultry and Wood Street Compters. The fire swept from the Tower to Temple church, and from the N. E. gate to Holborn bridge. Six persons were killed. The total loss of property was estimated at the time to be £10,730,500.

1794. *London*, 630 houses destroyed at Wapping. Loss above £1,000,000.
1834. “ Houses of Parliament burned.
1861. “ Tooley Street wharves, etc., burned. Loss estimated at £2,000,000.
1873. “ Alexandra palace destroyed.
1137. *York*, totally destroyed.
1184. *Glastonbury*, town and abbey burned.
1292. *Carlisle*, destroyed.
1507. *Norwich*, nearly destroyed; 718 houses burned.
1544. *Leith*, burned.
1598. *Tiverton*, 400 houses and a large number of horses burned; 33 persons killed. Loss, £150,000.
1612. “ 600 houses burned. Loss over £200,000.
1731. “ 300 houses burned.
1700. *Edinburgh*, "the Great Fire." —
1612. *Cork*, greater part burned, and again in 1622.
1613. *Dorchester*, nearly destroyed. Loss, £200,000.
1614. *Stratford-on-Avon*, burned.
1644. *Beaminster*, burned. Again in 1684 and 1781.
1675. *Northampton*, almost totally destroyed.
1683. *Newmarket*, large part of the town burned.
1694. *Warwick*, more than half burned; rebuilt by national contribution.
1707. *Lisburn*, burned.
1727. *Gravesend*, destroyed.
1738. *Wellingborough*, 800 houses burned.
1743. *Crediton*, 450 houses destroyed.
1760. *Portsmouth*, dockyard burned. Loss, £400,000.
1770. “ “ “ Loss, £100,000.
1802. *Liverpool*, destructive fire. Loss, £1,000,000.
1827. *Sheerness*, 50 houses and much property destroyed.
1854. *Gateshead*, 50 persons killed. Loss, £1,000,000.
1875. *Glasgow*. Great fire. Loss, £300,000.

FRANCE.

59. *Lyons*, burned to ashes. Nero offers to rebuild it.
1118. *Nantes*, greater part of the city destroyed.
1137. *Dijon*, burned.
1524. *Troyes*, nearly destroyed.
1720. *Rennes*, on fire from December 22 to 29, 850 houses burned.
1784. *Brest*. Fire and explosion in dockyard. Loss, £1,000,000.
1862. *Marseilles*, destructive fire.
1871. *Paris*. Communist devastations. Property destroyed, £32,000,000.

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[1] In mild cases the Australian sorcerer applies fire to the injured parts of his patients. The Persians kindle fire on the terraces of their house where the sick man lies. The Patagonians fire off guns and revolvers, and throw burning brands into the air. In Turkestan, sick children are made to leap over burning fires, and are struck seven times on the back. At every stroke remonstrances are addressed to the demon, such as "Begone to the sea! Begone to the desert!" Similar practices are still resorted to in mountainous regions of France when illness smites the flocks. In backward districts of Germany, when the swine sicken and die, the "wild fire," or "*Nothfeuer*," is kindled, but it would have no virtue if it were kindled by bachelors instead of by married men, or with matches and not by the orthodox process of rubbing wood against wood.

[2] In the hill ranges of Southern India penitents are made to pass through a row of burning huts, and are absolved after having passed the seventh. Before seed is sown it is still passed through the fire in Bavaria; and in Basuto-land children underwent recently a similar process, being held over the flame of a lighted altar. The earth was freed from the demons of sterility by lighting huge fires, and the fields became fertile as far as the blaze could be seen distinctly,—a practice which still prevails in many places from Norway to Central America.

Central and Southern Europe.

64. *Rome* burned during 8 days. 10 of the 14 wards of the city were destroyed.
1106. *Venice*, greater part of the city was burned.
1577. " fire at the arsenal, greater part of the city ruined by an explosion.
1299. *Weimar*, destructive fire; also in 1424 and 1618.
1379. *Memel* was in large part destroyed, and again in 1457, 1540, 1678, 1854.
1405. *Bern* was destroyed.
1420. *Leipsic* lost 400 houses.
1457. *Dort*, cathedral and large part of the town burned.
1491. *Dresden* was destroyed.
1521. *Oviedo*, large part of the city destroyed.
1543. *Komorn* was burned.
1634. *Fürth* was burned by Austrian Croats.
1680. " was again destroyed.
1686. *Landau* was almost destroyed.
1758. *Pirna* was burned by Prussians. 260 houses destroyed.
1762. *Munich* lost 200 houses.
1764. *Königsberg*, public buildings, etc., burned. Loss, £600,000.
1769. " almost destroyed.
1784. *Rokitzan* (Bohemia) was totally destroyed. Loss, £300,000.
1801. *Brody*, 1500 houses destroyed.
1859. " 1000 houses destroyed.
1803. *Posen*, large part of older portion of city burned.
1811. Forest fires in Tyrol destroyed 64 villages and hamlets.
1818. *Salzburg* was partly destroyed.
1842. *Hamburg*. A fire raged for 100 hours, May 5–7.

> During the fire the city was in a state of anarchy. 4219 buildings, including 2000 dwellings, were destroyed. One-fifth of the population was made homeless, and 100 persons lost their lives. The total loss amounted to £7,000,000. After the fire contributions from all Germany came in to help to rebuild the city.

1861. *Glarus* (Switzerland), 590 houses burned.

Northern Europe.

1530. *Aalborg*, almost entirely destroyed.
1541. *Aarhuus*, almost entirely destroyed, and again in 1556.
1624. *Opslo*, nearly destroyed. Christiania was built on the site.
1702. *Bergen*, greater part of the town destroyed.
1728. *Copenhagen*, nearly destroyed. 1650 houses burned, 77 streets.
1794. " royal palace with contents burned.
1795. " 50 streets, 1563 houses burned.
1751. *Stockholm*, 1000 houses destroyed.
1759. " 250 houses burned. Loss, 2,000,000 crowns.
1775. *Abo*, 200 houses and 15 mills burned.
1827. " 780 houses burned, with the university.
1790. *Carlscrona*, 1087 houses, churches, warehouses, etc., destroyed.
1802. *Gothenburg*, 178 houses burned.
1858. *Christiania*. Loss estimated at £250,000.
1865. *Carlstadt* (Sweden), everything burned except the bishop's residence, hospital, and jail. 10 lives lost.

Russia.

1736. *St. Petersburg*, 2000 houses burned.
1862. " great fire. Loss, £1,000,000.
1752. *Moscow*, 18,000 houses burned.
1812. " The Russians fired the city on September 14 to drive out the army of Napoleon. The fire continued five days. Nine-tenths of the city was destroyed. Number of houses burned, 30,800. Loss, £30,000,000.
1753. *Archangel*, 900 houses burned.
1793. " 3000 buildings and the cathedral burned.
1786. *Tobolsk*, nearly destroyed.
1788. *Mitau*, nearly destroyed.
1812. *Riga*, partly destroyed.
1834. *Tula*, destructive fire.
1848. *Orel*, large part of the town destroyed.
1850. *Cracow*, large part of the town burned.
1864. *Novgorod*, large amount of property destroyed.

Turkey.

The following fires have occurred at *Constantinople* :—

1729. A great fire destroyed 12,000 houses and 7000 people.
1745. A fire lasted five days.
1750. In January 10,000 houses burned: in April property destroyed estimated from £1,000,000 to £3,000,000. Later in the year 10,000 houses were destroyed.
1751. 4000 houses were burned.
1756. 15,000 houses and 100 people destroyed. During the years 1761, 1765, and 1767 great havoc was made by fire.
1769. July 17. A fire raged for twelve hours, extending nearly 1 mile in length. Many of the palaces, some small mosques, and nearly 650 houses were destroyed.
1771. A fire lasting 15 hours consumed 2500 houses and shops.
1778. 2000 houses were burned.
1782. August 12. A fire burned three days: 10,000 houses, 50 mosques, and 100 corn mills destroyed; 100 lives lost. In February 600 houses burned; in June 7000 more.
1784. August 5. A fire burned for 26 hours, and destroyed 10,000 houses, most of which had been rebuilt since the fires of 1782. In the same year, March 13, a fire in the suburb of Pera destroyed two-thirds of that quarter. Loss estimated at 2,000,000 florins.
1791. Between March and July 32,000 houses are said to have been burned, and as many in 1795.
1799. In the suburb of Pera 13,000 houses were burned and many magnificent buildings.
1816. August 16. 12,000 houses and 3000 shops in the finest quarter were destroyed.
1818. August 13. A fire destroyed several thousand houses.
1826. A fire destroyed 6000 houses.
1848. 500 houses and 2000 shops destroyed. Loss estimated at £3,000,000.
1865. A great fire destroyed 2800 houses, public buildings, etc. Over 22,000 people were left homeless.
1870. June 5. The suburb of Pera, occupied by the foreign population and native Christians, was swept by a fire which destroyed over 7000 buildings, many of them among the best in the city, including the residence of the foreign legations. Loss estimated at nearly £5,000,000.
1797. *Scutari*, the town of 3000 houses totally destroyed.
1763. *Smyrna*, 2600 houses consumed. Loss, £200,000.
1772. " 3000 dwellings burned. 3000 to 4000 shops, etc. consumed. Loss, £4,000,000.
1796. " 4000 shops, mosques, magazines, etc., burned.
1841. " 12,000 houses were burned.

India.

1631. *Rajmahal*. Palace and great part of the town burned.
1799. *Manilla*, vast storehouses were burned.
1833. " 10,000 huts were burned, March 26. 30,000 people rendered homeless, and 50 lives lost.
1803. *Madras*, more than 1000 houses burned.
1803. *Bombay*. Loss by fire of £600,000.

China and Japan.

1822. *Canton* was nearly destroyed by fire.
1866. *Yokohama*, two-thirds of the native town and one-sixth of the foreign settlement destroyed.
1872. *Yeddo*. A fire occurred in April during a gale of wind, destroying buildings covering a space of 6 square miles. 20,000 persons were made homeless.
1873. " A fire destroyed 10,000 houses.

United States.

1679. *Boston*. All the warehouses, 80 dwellings, and the vessels in the dockyards were consumed. Loss, £200,000.
1760. " A fire caused a loss estimated at £100,000.
1787. " A fire consumed 100 buildings, February 20.
1794. " 96 buildings were burned. Loss, £42,000.
1872. " Great fire, November 9–10. By this fire the richest quarter of Boston was destroyed.

> The fire commenced at the corner of Summer and Kingston streets. The area burned over was 65 acres. 776 building, comprising the largest granite and brick warehouses of the city, filled with merchandise, were burned. The loss was about £15,000,000. Before the end of the year 1876 the burned district had been rebuilt more substantially than ever.

1778. *Charleston*. A fire caused the loss of £100,000.
1796. " 300 houses were burned.
1838. " One-half the city was burned on April 27. 1158 buildings destroyed. Loss, £600,000.
1802. *Portsmouth* (Maine), 102 buildings destroyed.
1813. " 397 buildings destroyed.
1820. *Savannah*, 463 buildings were burned. Loss, £800,000.
1835. *New York*. The great fire of New York began in Merchant street, December 16, and burned 530 buildings in the business part of the city. 1000 mercantile firms lost their places of business. The area burned over was 52 acres. The loss was £3,000,000.
1845. " A fire in the business part of the city, July 20, destroyed 300 buildings. The loss was £1,500,000. 35 persons were killed.
1845. *Pittsburg*. A large part of the city burned, April 11. 20 squares, 1100 buildings destroyed. Loss, £2,000,000.
1846. *Nantucket* was almost destroyed.
1848. *Albany*. 600 houses burned, August 17. Area burned over 37 acres, one-third of the city. Loss, £600,000.

1849. *St. Louis.* 23 steamboats at the wharves, and the whole or part of 15 blocks of the city burned, May 17. Loss, £600,000.

1851. “ More than three-quarters of the city was burned, May 4. 2500 buildings. Loss, £2,200,000.

1851. “ 500 buildings burned. Loss, £600,000.

1850. *Philadelphia.* 400 buildings burned, July 9. 30 lives lost. Loss, £200,000.

1865. “ 50 buildings burned, February 8. 20 persons killed. Loss, £100,000.

1851. *Washington.* Part of the Capitol and the whole of the Congressional Library were burned.

1851. *San Francisco.* On May 4–5 a fire destroyed 2500 buildings. A number of lives lost. More than three-fourths of the city destroyed. Loss upwards of £2,000,000. In June another fire burned 500 buildings. Loss estimated at £600,000.

1857. *Chicago.* A fire destroyed over £100,000. 14 lives lost.

1859. “ Property destroyed worth £100,000, Sept. 15.

1866. “ Two fires on August 10 and November 18. Loss, £100,000 each.

1871. “ The greatest fire of modern times.

It began in a barn on the night of the 8th of October and raged until the 10th. The area burned over was 2124 acres, or 3½ sq. miles, of the very heart of the city. 250 lives were lost, 98,500 persons were made homeless, and 17,430 buildings were consumed. The buildings were one-third in number and one-half in value of the buildings of the city. Before the end of 1875 the whole burned district had been rebuilt. The loss was estimated at £39,000,000.

1862. *Troy* (N. Y.) was nearly destroyed by fire.

1866. *Portland.* Great fire on July 4. One-half of the city was burned; 200 acres were ravaged; 50 buildings were blown up to stop the progress of the fire. Loss, £2,000,000 to £2,250,000.

1871. October. Forest and prairie fires in Wisconsin and Michigan. 15,000 persons were made homeless; 1000 lives lost. Loss estimated at £600,000.

BRITISH NORTH AMERICA.

1815. *Quebec* was injured to the extent of £260,000.

1845. “ 1650 houses were burned, May 28. One-third of the population made homeless. Loss from £400,000 to £750,000. Another fire, on June 28, consumed 1300 dwellings. 6000 persons were made homeless. 30 streets destroyed. Insurance losses, £60,770.

1866. “ 2500 houses and 17 churches in French quarter burned.

1825. *New Brunswick.* A tract of 4,000,000 acres, more than 100 miles in length, was burned over; it included many towns. 160 persons killed, and 875 head of cattle. 590 buildings burned. Loss about £60,000. Towns of Newcastle, Chatham, and Douglastown destroyed.

1837. *St. John* (New Brunswick). 115 houses burned, January 13, and nearly all the business part of the city. Loss, £1,000,000.

1877. “ Great fire on June 21. The area burned over was 200 acres. 37 streets and squares totally or in part destroyed; 10 miles of streets; 1650 dwellings. 18 lives lost. Total loss, £2,500,000. Two-fifths of the city burned.

1846. *St. John's* (Newfoundland) was nearly destroyed, June 9. Two whole streets burned upwards of one mile long. Loss estimated at £1,000,000.

1850. *Montreal.* A fire destroyed the finest part of the city on June 7. 200 houses were burned.

1852. “ A fire on July 9 rendered 10,000 people destitute. The space burned was one mile in length by half a mile in width, including 1200 houses. Loss, £1,000,000.

SOUTH AMERICA.

1536. *Cuzco* was nearly consumed.

1861. *Mendoza.* A great fire followed an earthquake which had destroyed 10,000 people.

1862. *Valparaiso* was devastated by fire.

1863. *Santiago.* Fire in the Jesuit church; 2000 persons, mostly women and children, perished.

WEST INDIES.

1752. *Pierre* (Martinique) had 700 houses burned.

1782. *Kingston* (Jamaica) had 80 houses burned. Loss, £500,000.

1795. *Montego Bay* (Jamaica). Loss by fire of £400,000.

1805. *St. Thomas.* 900 warehouses consumed. Loss, £6,000,000.

1808. *Spanish Town* (Trinidad) was totally destroyed. Loss estimated at £1,500,000.

1828. *Havana* lost 350 houses; 2000 persons reduced to poverty.

1843. *Port Republicain* (Hayti). Nearly one-third of the town was burned.

Such great fires as the above are due, first, to the combustible contents of buildings and of the materials they are built of, and to radical defects in the method of construction, and, secondly, to the want of proper means and appliances for promptly extinguishing fires and preventing the spread of them Wooden buildings crowded together in narrow crooked streets, insufficient supply or absolute want of water, no fire-engines or only the feeblest machines for pumping water, and no organized or trained and disciplined body of firemen, were the conditions in earlier times, and in some countries they are the conditions still.

It is of importance, however, to bear in mind that the loss of property by great fires or conflagrations is really small in proportion to the loss by fires of moderate proportions. Thus a very competent authority, Mr. Cornelius Walford, gives it as his opinion that great fires, properly so called, "involving the lost of £50,000 and upwards, probably do not account for more than one-fifth of the losses of any average year." With the gradual improvement of the organization for coping with fires, the disproportion of conflagrations year by year becomes greater, so that really small but oft-occurring fires are now, in all well-governed communities, the subject which demands the careful attention of authorities. No means at present exist for accurately estimating the average annual loss of property by fire throughout the world, as in scarcely any country is an official record of fires and their results kept; and the imperfect returns of insurance companies are of comparatively little significance. It is estimated that the value of the insured property destroyed by fire all over the world amounts to from thirty to forty millions of pounds sterling annually. (See INSURANCE.)

In modern times great improvements have been made in the means employed for the prevention and extinction of fires. Broad thoroughfares have taken the place of narrow crooked streets; incombustible materials, such as brick, stone (natural and artificial), and iron are used, not only for the exterior, but for the interior of important buildings as far as practicable; the introduction into cities of an abundant supply of water is common; the electric fire-alarm telegraph, powerful steam fire-engines, extension ladders, and fire-escapes are among the mechanical appliances now in daily use. The two essential elements of the problem, however, are the fire-resisting character of buildings, and the organizations of trained men who can make the modern appliances effective. The methods of organization and procedure differ in different countries.

Fires are dealt with, first and chiefly, by way of prevention; secondly, by prompt measures for extinction when they have begun; and thirdly, by circumscription or limitation when the fire has obtained such a hold of any building or range that the salvation of the burning property is beyond hope. In concerting preventive measures, a knowledge of the principal causes of fires is of the utmost consequence; and as bearing on the ordinary causes the following abstract of the results deduced from about 30,000 fires, which occurred in London during the thirty-three years 1833-65, possesses significance. The percentages of different causes were:—Candles 11·07, children playing 1·59, curtains 9·71, flues 7·80, gas 7·65, lucifers 1·41, smoking tobacco 1·40, sparks of fire 4·47, spontaneous ignition 0·95, stoves 1·67, other known causes 19·40, unknown causes 32·88. There is too much reason to suspect that a considerable proportion of fires attributed to no known cause are due to incendiarism; and were an official investigation into the origin of fires instituted, it most probably would result in a great saving of property. Among preventive measures the fire-proof building of large erections occupies an important place. Much can be done structurally to prevent and to limit fires, although it is now conceded that the thorough fire-proofing of any building is almost impracticable. The erection itself may be fire-proof, but no sooner is it stored with inflammable goods or property than it ceases to be invulnerable. It is of the utmost importance to reduce the danger of fire to a minimum in many public structures, as for example, public record offices, banks, and great libraries and museums, and in such establishments generally the most complete precautions are observed. Open fire places are discouraged, arched floors are provided, the use of exposed wood is, as far as possible, avoided, gas and other lights are most carefully arranged, and fire-buckets, hose, and other appliances are in readiness for any emergency, while the premises are constantly patrolled by watchmen.

For the prompt extinction of a fire in its incipient stages the water-buckets, hand-pumps, and extincteurs alluded to below are of the utmost value. When such means fail or are wanting, the services of fire brigades and salvage corps, if brought into requisition without loss of time, generally result in a great saving of property; but when a fire has obtained complete mastery of a building, it is a recognized fact that the most powerful engines, even aided with unlimited supplies of water, are ineffectual, and the efforts of the firemen are directed to confining the conflagration within the limits over which it has secured a hold. To cut off neighboring properties, the use of gunpowder and other means of breaking connection are frequently required.

Fire Extinction.

In coping with fires, water is the great agent employed; and in towns where the supply of water is abundant, and where especially there is a constant and high pressure in the mains, the task of the firemen is much simplified. In such cases it is frequently only necessary to attach the fire-hose to the plugs, and the pressure in the main pipe is sufficient, without the aid of any engine, to throw the jet over the whole burning mass. But it is only rarely that towns are so favorably situated, and for the equipment of an ordinary fire brigade and fire establishment the following among other appliances are required.

Hand-Pump and Bucket.—A small hand-pump which can be set into a bucket of water is the most effective means of distributing a small supply of water without waste. If judiciously used it will put out any fire in its earlier stages.

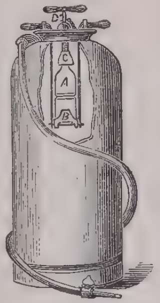

Fig. 1.—Portable Extinguisher.

The Portable Chemical Extinguisher (fig. 1), *Dick's Patent Extincteur*, etc., designed to answer the same purpose as the hand-pump and bucket, are now in extensive use in factories, warehouses, and public buildings. The vessel is a cylindrical tank, holding 7 gallons or upwards of water, and is carried on the back. Carbonic acid is generated at the moment of using within the vessel itself, and from its compressibility affords the power which projects the liquid. The working pressure varies from 70 to 120 ℔ per square inch, according to the temperature of the surrounding atmosphere; and the projectile range of the jet is from 40 to 50 feet.

Hand-Worked Engines consist essentially of a pair of single-acting force-pumps mounted on wheels and worked by hand. They vary much in size, weight and power, and are hauled by men or horses. Those most used in Paris are worked by eight men, and throw a $\frac{5}{8}$-inch jet to a height of 100 feet. Each pump is 5 inches in diameter, with $9\frac{1}{2}$-inch stroke. A smaller engine that may be carried into buildings by four men is also used. Those of the London fire brigade are worked most effectively by 26 to 30 men; pumps 6 or 7 inches diameter and 8 inches stroke. Each stroke (with 6-inch pumps) delivers $1\frac{2}{3}$ gallons of water. Still larger engines have been used, requiring 40 to 50 men. In the United States these as well as smaller hand-worked engines have given place to steam fire-engines, with pumps of the same size, in all the larger towns.

Steam Fire-Engines are essentially a pair of single-acting suction and force pumps driven by steam power. They are hauled by two horses, or are self-propellers. They weigh, as drawn to fires, from 5000 to 8000 ℔. Fig. 2 represents the kind that is most in use in the United States. The diameter of the cylinder in this engine is $7\frac{1}{2}$ inches, and that of the pumps $4\frac{1}{2}$ inches, with a stroke of 8 inches. The boilers are tubular, of sufficient capacity to work the pumps 500 strokes per minute. The usual working pressure of steam is 80 to 100 ℔ per square inch. The weight as drawn to fires is about 8000 ℔.

Chemical Engines are of several forms and sizes. The size most used consists essentially of two cylindrical copper or steel tanks, each holding 80 gallons of water (fig. 3). The charge for each tank is 28 ℔ bicarbonate of soda and 14 ℔ sulphuric acid. The soda is dissolved in the water, and the acid is held in a leaden jar within the tank, which is securely closed. At the moment of using the sulphuric acid is mixed with the water, and instantly combining with the soda causes carbonic acid to be given off with a pressure

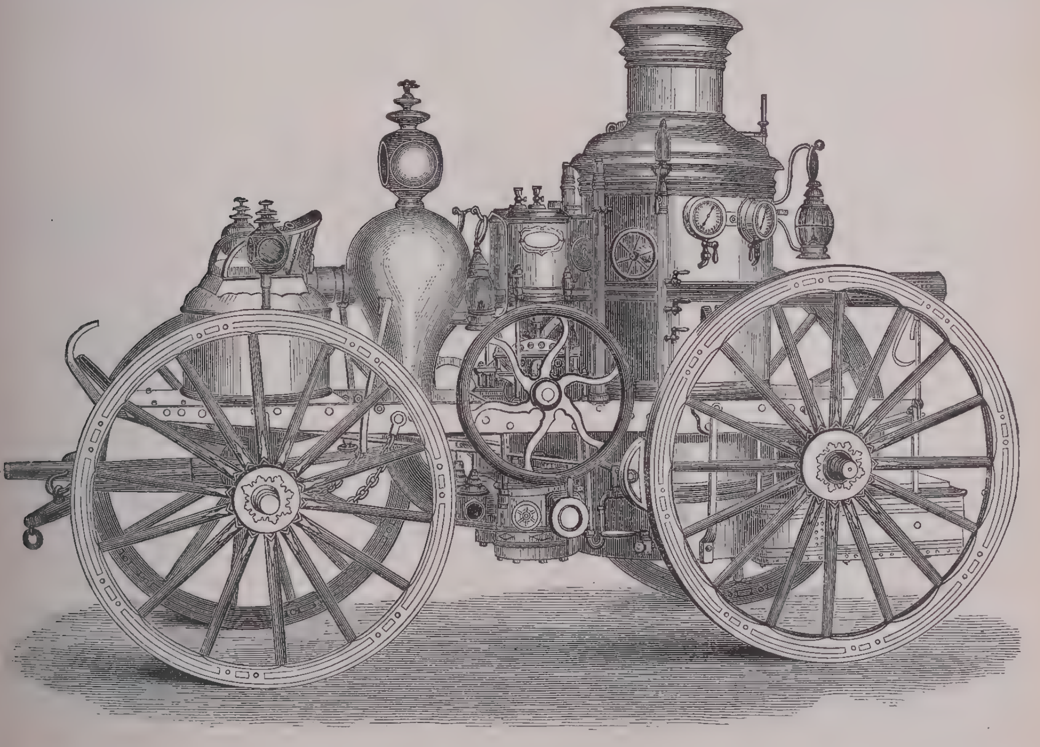

Fig. 2.—Steam Fire-Engine.

of 140 ℔ on the square inch. The tanks are used independently and charged separately, so that a continuous stream of water, usually ¼-inch jet, may be maintained. 300 feet of ¾-inch rubber hose is carried. The whole apparatus, charged and carrying three men, weighs about 5000 ℔, and is drawn by two horses. The hose is rarely carried upon the engine; it is usually on a separate carriage drawn by one horse. The reel carries about 1000 feet of 3½-inch rubber hose. Six hosemen ride on the carriage. The total load is about 3000 ℔.[1]

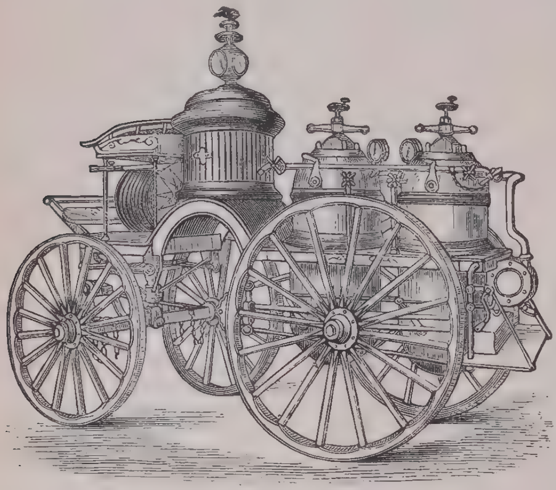

Fig. 3.—Chemical Engine.

Ladder Carriages carry from 20 to 25 ladders of various lengths (see fig. 4). Two ladders spliced reach 70 feet. The carriage fully equipped and carrying 12 men weighs from 7000 to 8000 ℔, and is drawn by two horses. The "aërial ladder" (so-called) reaches when fully extended a height of 100 feet, and is self-supporting; it is readily moved, when raised. It is made in 8 sections, each being a ladder about 12 feet long, and is put together and raised in six minutes. It is available as a fire escape. The total load with its carriage is about 6000 ℔.

Electric Fire-Alarm Telegraph.—Time is a most important element in all fires, and the purpose of this telegraph is to put it in the power of any one discovering a fire to make known the locality of it to the fire department in the shortest possible time. Throughout the town or city "alarm boxes" are placed, connected by telegraph wire with the central office and all the stations of the department. They are small iron boxes about a foot square, numbered in order and placed conspicuously on telegraph poles, or on the side of a building at corners of streets. Inside of each is a simple clock-work, which is set in motion by the pulling of a handle, and which records at the central office the number of the box. To guard against false alarms the outer door of the box is locked, but keys are kept at hand and are in the possession of all policemen and firemen.

The *Automatic Signal Telegraph* gives instantaneous notice at the headquarters of the fire department, or at the nearest engine-house, of the existence of a fire, by the action of the fire itself, and records there the number of the building and the room in which it occurs. The apparatus is very simple, and may be fully relied on. It consists of a small tube, called a thermostat, about 3 inches long, containing a spiral strip of metal, so arranged that the expansion due to a rise of thirty degrees above the ordinary temperature of the room in which it is placed, will close the connection between the two poles of a battery, and produce an electric current, which, passing through a small iron box containing a clock-work and circuit breaker, called a "transmitter," at once strikes a bell and starts a register at the nearest station of the fire department, which records the number of the building and the room in which the fire has broken out. The thermostat is placed upon the ceiling of each room at intervals of 25 feet throughout the building, the transmitter in every room that requires a separate signal. The signal is transmitted even when the wires are broken. This telegraph has been adopted in New York and Boston.

The electric arrangements connected with the fire brigade in the city of Glasgow, which have been devised by Mr. R. S. Symington, telegraph engineer, have been carried out on a scale of much efficiency and perfection. The city is divided into six fire districts, all connected by telegraph with the central principal station. There are also placed throughout the city 80 "electric fire-alarm boxes," at the corners of the principal streets, and the occurrence of fire can through these be instantly telegraphed to the nearest "fire station," and at the same time to the "central station." On the arrival of the first detachment, the "box" from which the signal was given is by an ingenious arrangement immediately converted into a "telegraph station" (for the time being), connecting all the stations, and enabling the firemaster to command the whole "staff." The firemaster, as also the principal men, reside on the premises at the central station; and men and horses are summoned by an electric-bell system leading into each man's bedroom. Besides the above arrangements there are placed in many warehouses and extensive establishments throughout the city about 2000 electric thermostats, by which the rising of a mercurial column causes a loud gong to sound, at once drawing attention to unoccupied or shut-up premises.

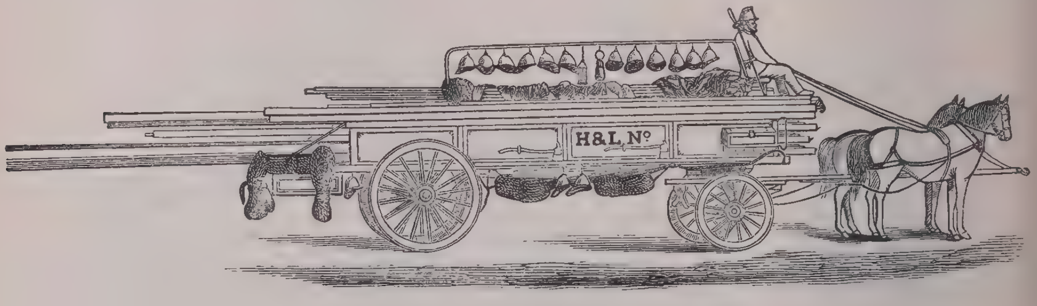

Fig. 4.—Ladder Carriage.

Organization.—The organizations of Paris and Berlin are similar, and are based upon the idea of small detachments of men, lighter machines, and a large number of stations, and on the presumption that no fire will have got beyond the control of the small detachment before it is discovered and made known. The results have been generally satisfactory under the conditions existing in those cities. In London larger detachments and fewer stations have given good results. In the principal cities of the United States different conditions have necessitated a proportionately larger force of men and more effective appliances.

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[1] A combined manual and chemical fire-engine is made by Dick of Glasgow, which consists of an iron tank on wheels, divided into two galvanized compartments. It has two pumps, with vertical motion, connected with the suction pipes, to fill the compartments with water where the chemicals are dissolved, and two pumps to project the chemical liquid from each compartment into the air-chamber, where they combine and generate carbonic acid gas. The gas is held in solution by the water, and is conveyed direct to the fire, upon which it exercises its fire-extinguishing power. The engine can be worked by four or five men, and is capable of throwing 30 gallons of water per minute, containing 250 gallons of carbonic acid gas, a distance of 75 to 90 feet.

London.—The metropolitan fire brigade is a force of about 400 men under the control of the Board of Works, but under the immediate command of the "chief officer." The city is divided into a number of districts, each under a "superintendent." Within each district are fire-engine stations properly equipped, each under an "engineer." The force at these stations is the unit of organization. Each engineer has independent telegraphic communication with his superintendent, and he in turn with the chief officer. 26 steam fire-engines and 86 hand-worked engines are in use. Floating steam fire-engines protect the river front. The chief officer has absolute command at fires.

Paris.—The firemen are a corps, "sapeurs-pompiers," attached to the War Department, but at fires the corps acts under orders from the prefect of police. It is under the immediate command of a colonel, and is divided into 12 companies, the company being the unit of organization. Fire stations, manned by three men and provided with hand-pumps and fire-escapes, are distributed throughout the city. If the three men of a station, with bystanders impressed into the service by the police, are unable to extinguish the fire, men from other stations of the same company are summoned. Additional companies are called out by orders from headquarters of the corps. Hand-engines are the main reliance, but in 1876 five steam fire-engines were in use.

Berlin.—The department is subject to military discipline, and is under the command of a "fire-director" with subordinate officers. The city is divided into four inspection districts, with an officer in charge of each. Each district has numerous fire dépôts, according to its needs, and each dépôt is in charge of a fireman and four men, and is furnished with a small hand-engine, a hook and ladder, and a fire-escape. The principal stations are connected by telegraph.

New York.—The fire department of New York may be taken as the type of the best system now employed in the United States. It is on a military basis, under the control of a board of commissioners appointed by the mayor. The active force is under the immediate command of the "chief of department," and consists of 10 battalions, each of 6 companies, in all about 750 men. Each company, whether engine or ladder company, has its own house, where the men live and the apparatus is kept. The whole force is at all times on duty and in the houses, except such small detachments as are on street patrol or at their meals. The horses stand harnessed in their stalls, which are placed immediately in the rear of the engine, and are loosened by a simple mechanical appliance which, simultaneously with the striking of the alarm, opens the front of the stall; the horses, trained to move at the sound of the gong, advance rapidly each to his own place at the pole. They are instantly hitched in, the men spring to their seats, and the carriage is driven at high speed to the "alarm box" from which the alarm was given. To make sure that there will be a working pressure of steam on reaching the fire, the water in the engines, as they stand in the houses, is kept always at boiling point by the circulation of hot water from small stationary boilers, and fire is lighted in the engine the instant it leaves the house. Every effort is made to save even a few seconds of time, so that the interval between sounding the alarm and pumping water on the fire will average three minutes, and rarely exceeds five minutes. The city is divided into 10 battalion districts. The smallest of these represent each an area of about 5000 by 2000 feet, and comprise the most exposed parts of the city; but most of the districts are from two to three times as large. The signal boxes of the electric fire-alarm telegraph are placed conspicuously in the streets about 400 feet apart in the more crowded portion of the city, and from 1000 to 1200 feet in other portions. There are 540 in all. Alarms given from these boxes are instantly telegraphed from the headquarters of the department to each company house in the city. The first alarm calls out two or more companies previously designated; a second and third call out additional force. There are in use 57 steam fire-engines (5 of which are self-propellers), 1 steam fire-boat, 10 chemical engines, and 18 ladder carriages, including 5 "aërial ladders." The men are well-disciplined and skilful firemen.[1]

(A. P. R.)

FIRE-CLAY, FIRE-BRICKS.

Fire-clays may be defined as native combinations of hydrated silicates of alumina, mechanically associated with silica and alumina in various states of subdivision, and sufficiently free from silicates of the alkalies and from iron and lime to resist vitrification at high temperatures; the absence of the vitrifiable element is, however, merely a question of degree, as no native clays are wholly free from iron, the alkalies, lime, and the other alkaline earths.

Fire-clay may be looked upon as a special term for the gray clays of the Coal-Measures, interstratified with, and generally in close proximity to, the seams of coal, in beds varying from a few inches to many yards in thickness. They are locally known as "clunches" and "underclays," and are supposed to represent the soil that produced the vegetation from which the coal was formed.

The association of coal with the fire-clays of the carboniferous formation has localized the manufacture of fire-bricks, and by far the larger proportion are produced in the Coal-Measure districts, especially at Stourbridge, celebrated for producing a highly refractory brick, Broseley, Benthall, Madeley and Coalbrookdale in the Shropshire coal-field, and in the Midland, Yorkshire, North and South Wales, Durham, and the Scotch coal-fields; but in later years the area of fire-brick manufacture has much widened. There has been an extensive production since about 1850 from the Eocene clays in the neighborhood of Poole and Wareham in Dorsetshire; and a more limited supply from the Miocene between Bovey Tracey and Newton Abbot in Devonshire.

Still more recently Cornwall has become the seat of the manufacture, where, as at Calstock, Tregoning Hill near Breage, St. Ednor near St. Columb, and Lee Moor, fire-bricks of fine quality are made from china-clay refuse and disintegrated granite. Mr. Argall of the Tregoning Hill Company states that the locality was one of the first seats of china-clay mining between the years 1730 and 1750, and that in 1862 the present company commenced to make fire-bricks and tiles from the refuse of the clays, taking about two-thirds of silica and one-third of mica, which are mixed together in a pug mill, moulded and burnt in round ovens holding about 16,000 bricks, and that a very superior fire-brick is made from clay direct from the "stopes," containing

Silica	40·00	per cent.,
Alumina	37·00	"
Magnesia	2·00	"
Potash	9·00	"
Water	12·00	"

which are employed by founders, smelters, gas companies, etc. The price paid at the works is from 50s. to 55s. per 1000. The source of the materials is decomposed granite, of which Tregoning Hill consists.

The Hingston Down fire-clay deposit, near Calstock, supplying the Calstock fire-brick works, the Phœnix works, and the Tamar works in the same neighborhood, consists of a range of decomposed granite with an average width of three-quarters of a mile, running east and west for 3 or 4 miles, extending to an ascertained depth of from 300 to 400 feet, and intersected by mineral lodes. The Calstock Fire-Brick Company (limited), superintended by Mr. C. B. Evate, commenced operations in the year 1870, and manufactured from the decomposed granite fire-bricks of a highly refractory character, which are delivered free on board at the port of Calstock at from 50s. to 60s. a thousand, weighing about 3½ tons. Another source of fire-brick material, scarcely yet developed, is the pockets or depressions occurring in the mountain limestone of North Wales, Derbyshire, and Ireland, containing white refractory clays and sands, the insoluble remnants from the local dissolution of the limestone, intermixed with the débris of the overlying millstone grit. These clays and sands when evenly mingled are sufficiently adhesive to be moulded, and their small contractility and highly refractory character render them pre-eminently suitable for fire-brick manufacture. Fire-brick works have already been established on the estate of Captain Cooke of Colomendy Hall, near Mold, and the refractory clays and sands are largely employed for lining furnaces, 3000 tons having been sold for this purpose alone in the year 1877.

The fire-clays of the Coal-Measures vary as regards their refractory character, not only in the different coal-fields, but the individual strata in close alternation often present sudden variations, refractory beds being interstratified with useless strata largely charged with disseminated carbonate of iron. The gray color of the Coal-Measure clays is partially due to the presence of this mineral, which, whether disseminated through the mass or otherwise occurring in excess as concretionary nodules, is prejudicial to the clays as a material for fire-bricks. Carbonaceous matter is also present in variable proportions, coloring the clay from a slaty-black to a pale gray, but as this is eliminated in the earlier stages of the burning of the bricks, its presence in no way influences their refractory character.

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[1] The foregoing article is reprinted by permission of Messrs. Little, Brown & Co., Boston, Mass., from *Great Fires and Fire Extinction*, by General Alfred P. Rockwell, Boston, 1878.

The relative proportion of silica and alumina which some manufacturers have laid undue stress upon as indicating heat-resisting quality is of little moment, as both these constituents, whether occurring in combination as silicates of alumina, or as free alumina and silica, are essentially the refractory elements of all good fire-bricks, being unvitrifiable *per se*, excepting when associated with the alkalies, lime, or oxides of iron. The plastic character of refractory clays is also of limited influence on their suitability for fire-brick manufacture; extreme plasticity, which is generally accompanied by excessive contractility and vitrifiability, is prejudicial. As a rule few clays or materials used in the manufacture of fire-bricks are insufficiently plastic to prevent their being easily moulded, and in the manufacture by the *dry process*, or the compression of the brick out of nearly dry pulverized clay, plasticity is not so essential a quality. As regards chemical composition the following analyses indicate its general character, and the variability of the proportion of the constituents of some of the more important fire-clays :—

Coal-Measure Clays.

A. *Stourbridge Clay.* (Omitting the water.)

Silica	70·60
Alumina	26·60
Oxide of iron	2·0
Lime	1 40
Magnesia	traces.

B. *Stourbridge Clay.* (Analysis by Richardson.)

Silica	70·50
Alumina	25·46
Protoxide of iron	2·04
Magnesia	1·05

C. *Glass House Pot Clay, Tintam Abbey, Stourbridge.* (Analysis by A. W. Wills.)

Silica	73·82
Alumina	15·88
Protoxide of iron	2·94
Alkalies	0·90
Water	6·45

D. *"Best Clay," Tamworth.* (Analysis by A. W. Wills.)

Silica	71·40
Alumina	21·17
Protoxide of iron	0·91
Lime	0·04
Alkalies	0·82
Water	6·06

E. *Fire-Brick Clay from Newcastle.* (Analysis by H. Taylor.)

Silica	55·50
Alumina	27·75
Sesquioxide of iron	2·01
Lime	0·67
Magnesia	0·75
Alkalies	2·63
Water	10·53

F. *Fire-Clay from Newcastle.* (Excluding the water.)

Silica	69·25
Alumina	17·90
Oxide of iron	2.97
Magnesia	1·30
Lime	7·58

G. *Clay from Glasgow,* used for saggars, glass house pots, bricks, etc. (Percy's *Metallurgy.*)

Silica	66·16
Alumina	22·54
Protoxide of iron	5·31
Lime	1·42
Water	3·14

H. *Dinas Fire-Clay, South Wales.* (Excluding the water.)

Silica	91.95
Alumina	8·05

With traces of iron.

J. *Fire-Clay from Dowlais.* (Analysis by J. E. Rily.)

Silica	67·13
Alumina	21·18
Sesquioxide of iron	1·85
Lime	0·32
Magnesia	0·84
Alkalies	2·02
Organic matter	0·90
Water	6 21

K. *Welsh Fire-Clay.* (Excluding the water.)

Silica	80·10
Alumina	17·90
Oxide of iron	1·0
Lime	1·0

Note.—In comparing the percentages of the individual constituents, it must be noticed that some of the analyses exclude the water.

Tertiary Clays of Dorset and Devon used for Fire-Brick Manufacture.

L. *White Clay, Branksea Island, Dorset.* (Analysis by Professor Way.)

Silica	65·49
Alumina	21·28
Oxides of iron	1·26
Alkalies and alkaline earths	7·25
Sulphate of lime	4·72

M. *Black Clay, Branksea Island, Dorset.* (Analysis by Professor Way.)

Silica	72·23
Alumina	23·25
Oxides of iron	2·54
Alkalies and alkaline earths	1·78

N. *Beacon Hill Clay, near Poole.* Lower Bagshot Beds.

Silica	63·00
Alumina	33·50
Oxide of iron	1·00
Magnesia	2·00

O. *Beacon Hill Clay, near Poole.* Lower Bagshot Beds.

Silica	53 52
Alumina	33·68
Lime	0·76
Magnesia	0·14
Oxide of iron	0·52
Alkalies	0·04
Water	11·34

P. *Blue Ball Clay, Bovey Tracy, Devon.* Miocene Lignite Formation.

Silica	47·00
Alumina	48·00
Oxides of iron	1·5
Magnesia	2·0
Water, etc	1·5

The above analyses indicate a preponderance of silica in the Coal-Measure fire-clays compared with the Tertiary clays of Devon and Dorset, in which a larger proportion of alumina occurs. The latter character is accompanied by tenacity and plasticity, and greater contraction in drying and burning, which, when excessive, is counteracted by mingling with the clay sand and ground burnt clay or sherds.

Contractility.—The contraction in burning (excluding the contraction in drying) of several Coal-Measure fire-clays pressed out of nearly dry pulverized clay was ascertained by the writer to be as follows:

Fire-clay occurring between the "Penystone Measure and "Vigor's" clay, Shropshire coal-measures, near Broseley	1	per cent.
"Two-foot coal" fire-clay, Shropshire coal-measures	5	"
"Ganie coal" fire-clay, Shropshire coal measures	2	"
Bewdley Forest fire-clay, from the works of Mr. Mobberly, Bewdley, No. 1	3	"
Do. do. No. 2	4	"
Do. do. No. 3	1	"
Stourbridge fire-clay, from Messrs. Fisher Brothers, "The Hayes," Stourbridge, No. 1	1	"
Do. do. No. 2	1	"
"Best" fire-clay, from the earl of Dudley's pits near Dudley	2	"
"Seconds" and offal, from same	1	"
Fire-clay, Maryport, Cumberland	4	"

The average contraction of the Coal-Measure fire-clays is thus little over two per cent. A brick manufactured from the best Stourbridge clay without admixture of burnt material contracted seven-eighths of an inch in nine inches, but this would probably represent the contraction both in drying and burning. The contraction in burning of the Tertiary fire-clays used for the manufacture of fire-bricks in Devon and Dorset is much more than that of the Coal-Measure clays.

Contractility of Devonshire Clays.

"Best pipe-clay," Miocene Lignite Formation, Bovey Tracey, from the works of Messrs. Watts, Blake, Bearne & Co	12	per cent
"Cutty clay"	8	"
"Household clay"	5	"
"Stoneware clay"	7	"
"Alum-makers' clay"	7	"
"Drain pipe clay"	4	"
"Blue ball clay"	13	"
"Black ball clay"	11	"
"Brown ball clay"	11	"
"Black carbonaceous clay"	10	"

Average contraction a little under 9 per cent.

Contractility of Dorsetshire Clays. Lower Bagshot (Eocene) Beds.

"White clay" from Messrs. Pike's works, Wareham	10	per cent.
"T" clay	11	"
"V" clay	13	"
"Black" clay	13	"
"Blue" clay	13	"
"H" clay	15	"
"P" clay	15	"
"S" clay	7	"
Mottled sandy clay, Lower Bagshot Beds, Wareham	1	"
Clay from Upper Plant Bed, Lower Bagshot Beds, Studland Bay, Dorset	6	"

The clays above enumerated are not exclusively used for fire-brick manufacture, but fairly indicate the general cha racter of the Tertiary fire-brick clays, which, compared with the Coal-Measure fire-clays, are characterized by a preponderance of alumina, tenacity of texture, contractility in the kiln, and an absence of iron and the alkalies, etc., which tend to vitrification. Tenacity of texture in a fire-brick material is, however, a mechanical condition, which, *cæteris paribus*, assists vitrification, a coarse open body being more refractory than a close homogeneous brick of similar chemical composition. A well manufactured brick should be of a pale cream or clear buff color, uniform throughout its mass, and burnt to the full extent of its contractility.

The chemical changes which take place in the burning consist first, of the destruction of the disseminated carbonaceous matter, the dehydration of the silicates of alumina, destroying their plastic character, and the decomposition of the disseminated carbonate of protoxide of iron, converting it into anhydrous sesquioxide, to which the yellow color of the burnt brick is due; if the burning is carried to a high state of vitrification the yellow tint is replaced by a dull gray, due to the partial reduction of the sesquioxide of iron and its conversion into silicate of protoxide or minutely disseminated particles of metallic iron; any alkalies present also form vitreous combinations with the silica during the latter stages of the burning. The paleness of color of a fire-brick is not always a safe indication of the absence of iron, as the presence of a large proportion of carbonaceous matter in the clay tends to bleaching by the reduction of the coloring sesquioxide to a lower oxide preserved as a silicate in a comparatively colorless condition. Again, the presence of lime and the other alkaline earths, which are disadvantageous fluxing elements, will cloak the coloring power of a large percentage of oxide of iron by the formation of a pale double silicate of lime and iron. This is taken advantage of in the manufacture of buff building bricks by mixing ground chalk with ferruginous clays which would otherwise burn dark red.

A properly burnt brick, uniform in color throughout its mass, can only be obtained by slow progressive firing; a broken brick that has been too quickly burnt, though pale on the surface, presents a darker central patch and concentric rings of various shades of color, due mainly to the different states of oxidation of the iron, and partly to the presence of unconsumed carbonaceous matter; but the chemistry of this color-variegation is not clearly understood.

Durability of Fire-Bricks.—The destruction and wearing out of a fire-brick in its ordinary uses takes place in different ways. First, it may waste by crumbling and shattering; this occurs only when the brick is unnecessarily porous in texture, or from the presence of extraneous lumps of foreign materials, such as small pebbles and fragments of lime and iron-stone, which the manufacturer endeavors to get rid of by sifting or crushing before the clay is moulded. Secondly, the gradual vitrification of the brick under the pressure of the superimposed structure distorts its form, and the semiplastic red-hot or white-hot mass is gradually squeezed out of shape, and has to be periodically replaced in the hotter parts of the furnaces and kilns. However completely a brick has been burnt, bringing its dimensions almost to the limit of contractility, constant exposure to long-continued heat still further reduces its bulk, causing the displacement of the mass of which it forms a part, and necessitating replacement and repairs. Thirdly, there is the gradual fretting away of the exposed brick surface by vitrification, however refractory a brick may be; when it lines flues and furnaces, the fumes and ashes incessantly carried into contact with it bring foreign accessions, which vitrify the exposed portions and form a coating of viscid slag, which eats into the brick surface, creeping down and clogging the flues and fire-holes with a vitreous mass. In the case of blast-furnaces the fretting away of the surface of the fire-brick linings gradually enlarges their capacity, the surface destruction decreasing from the tweers upwards, the faces opposite the impact of the blast being distinctly excavated beyond the outline of the enlarged circumference. In one of the furnaces of the Madeley Wood Company, Madeley, Shropshire, "blown in" in 1867 and "blown out" in 1874, the diameter at the base, originally 3 feet, had been enlarged to about 7 feet 6 inches, and at the widest part, a little below the middle, from 12 feet, its original diameter, to 13 feet. In another furnace, after ten years' blast, the original diameter of 4 feet 5 inches at the base had been enlarged to 9 feet 6 inches; at a third of its height from 9 feet 11 inches to 12 feet; and half way up, from 11 feet 9 inches to 12 feet 10 inches, the destruction of brick-surface gradually decreasing towards the top, where the increase of size was but trifling. This would represent a consumption of brick-surface of from 3 to 4 inches a year at the tweers, and about three-quarters of an inch a year towards the middle of the furnace.

It is beyond the scope of this article to enter into the details of fire-brick manufacture, which in its main features resembles the manufacture of building bricks, except that fire-bricks are rarely if ever burnt in clamps.

Properly constructed ovens on the "down-draft" principle, with the outlet from the bottom into a tall chimney, are now almost universally employed, as they ensure greater regularity in the burning than in the old form of kiln, with a direct escape from the top, as well as economy in fuel. The consumption of coal varies from 9 to 15 cwt. per 1000 bricks, exclusive of the coal used in the drying stoves.

Coal-Measure fire-clays are often mined in an almost rocky condition, requiring long exposure to the weather to effect their disintegration. The softer clunches or clays are sometimes prepared for the moulder by "weathering," but the more common practice is to grind the fire-clay just as it comes from the pit under heavy "runners" or rollers, effecting a granular texture which is a desirable quality in a refractory brick. It is now becoming a common practice to grind up with the raw clay from one-fourth to one-third of its weight of broken burnt sherds or fire-bricks. All waste materials are thus utilized, and the excessively contractile character of highly plastic clays such as those of Dorsetshire is counteracted. Siliceous sand is also sometimes mixed with the more plastic clays to reduce their contractility.

The ground clay is either brought into a plastic state with water in a pug-mill and moulded by hand, or by brick-moulding machinery generally connected with the pug-mill outlet; or the partially moist ground-clay dust is compressed into bricks in iron moulds by steam power, a modification of Prosser's well-known process. More shapely bricks are thus produced than by plastic moulding, and their perfectly true flat sides enable a minimum of jointing materials to be employed—a circumstance of importance in the stability of fire-brick masonry, as thick fire-clay jointing contracts in the firing, tending to shatter the structure.

In addition to the use of fire-clay for the bedding of all fire-brick structures, it forms the materials of gas retorts, crucibles, and every kind of potter's kiln furniture, such as saggars, cranks, slip kiln bottoms, enamel kiln linings, etc. These have been up to within the last year or two moulded out of plastic clay, but by processes and machinery recently patented by Mr. A. Maw, saggars, cranks, and every kind of kiln furniture can be moulded out of nearly dry pulverized clay, at a great reduction in cost below that of the plastic process, and the exact regularity of form attained effects a large saving of space in the ovens and kilns. Moreover, the even bearing on each other of the regularly-shaped saggars when piled up in the oven, reduces the "wear and tear" and breakage to a minimum. Fire-bricks vary much in price in the different producing districts,—about 40s. per 1000 may now be looked upon as a minimum, ranging up to 70s. and 80s., further augmented by the cost of carriage to other districts. A thousand fire-bricks weigh from 3¼ to 4 tons. (G. M.)

FIRENZUOLA, Agnolo (1493–*c.* 1545), Italian poet and littérateur, was born at Florence, September 28, 1493. The family name was taken from the town of Firenzuola, situated at the foot of the Apennines, its original home. The grandfather of Agnolo had obtained the citizenship of Florence and transmitted it to his family. Agnolo was destined for the profession of the law, and pursued his studies first at Siena and afterwards at Perugia. There he became the associate of the notorious Pietro Aretino, whose foul life he was not ashamed to make the model of his own. They met again at Rome, where Firenzuola practised for a time the profession of an advocate, but with little success. It is asserted by all his biographers that while still a young man he assumed the monastic dress at Vallambrosa, and that he afterwards held successively two abbacies. Tiraboschi alone ventures to doubt this account, partly on the ground of Firenzuola's licentiousness, and partly on the ground of absence of evidence; but his arguments are not held to be conclusive. Firenzuola left Rome after the death of Pope Clement VII., and after spending some time at Florence, settled at Prato as abbot of San Salvatore. His writings, of which a collected edition was published in 1548, are partly in prose and partly in verse, and belong to the lighter classes of literature. Among the prose works are—*Discorsi degli Animali*, imitations of Oriental and Æsopian fables, of which there are two French translations; *Dialogo delle Bellezze delle Donne*, also translated into French; *Ragionamenti Amorosi*, a series of short tales in the manner of Boccaccio, rivalling him in elegance and in licentiousness; *Discacciamento delle Nuove Lettere*, a controversial piece against Trissino's proposal to introduce new letters into the Italian alphabet; a free version or adaptation of *The Golden Ass* of Apuleius, which became a favorite book and passed through many editions; and two comedies, *I Lucidi*, an imitation of the *Menæchmi* of Plautus, and *La Trinuzia*, which in some points resembles the *Calandria* of Cardinal Bibbiena. His poems are chiefly satirical and burlesque. All his works are esteemed as models of literary excellence, and are cited as authorities in the vocabulary of the Accademia della Crusca. The date of Firenzuola's death is only approximately ascertained. He had been dead several years when the first edition of his writings appeared (1548). His works have been very frequently republished, separately and in collected editions. A convenient reprint of the whole was issued at Florence in 2 vols. in 1848.

FIREWORKS. See PYROTECHNY.

FIRMICUS, MATERNUS JULIUS, the name of a Latin writer, and most probably of two, who lived in the reign of Constantine and his successors. About the year 347 one of them composed a work entitled *De Erroribus Profanarum Religionum*, which he inscribed to Constantius and Constans, the sons of Constantine, and which is still extant. During the life of Constantine a person of the same name as the author of the work on Christianity commenced his eight books on astronomy, which were not completed however till 354 A.D. They were first printed by Aldus Manutius in 1501, and have been reprinted several times since. The work is interfused with Neo-Platonic philosophy, and its spirit is hostile to Christianity. Its diction in some cases resembles that of the Christian work, but it is impossible that two works so contradictory in tone and spirit could have been written by the same person at the same period; and even if it be supposed, contrary to the evidence, that the Christian work was written subsequent to the heathen one, all the contradictions between them would not be accounted for.

The Christian work is preserved in a Palatine MS. in the Vatican libary. It was first printed at Strasburg in 1562, and has been reprinted several times, both separately and along with the writings of Minucius Felix, Cyprian, or Arnobius. The most correct editions are those by Conr. Bursian, Leipsic, 1856, and by C. Halm, in his *Minucius Felix*, Vienna, 1867.

FIROZPUR, or FEROZEPORE, a district of British India in the Lahore division or commissionership under the jurisdiction of the lieutenant-governor of the Punjab, lies between 30° 18′ 12″ and 31° 10′ 36″ N. lat., and 74° 5′ and 75° 29′ E. long. It is bounded on the N. by Lahore, Amritsar, and Kapurthálá state, E. by Jalandhar and Ludhiána, S. by Patiála, Nabhá, and Faridkot states, and W. by Sirsá. The surface of the district is level, with the exception of a few sand-hills in the south and south-east. The country consists of two distinct tracts, that liable to annual fertilizing inundations from the Sutlej, known as the *bhet*, and the *rohi* or upland tract. The only river is the Sutlej, which runs along the north-western boundary. The census of 1868 returned the population at 303,489 males and 245,764 females—total 549,253, of whom 68,406 were Sikhs, 245,659 Mahometans, 160,487 Hindus, and 74,701 "others." The area of the district is 2740 square miles, or 1,753,250 acres, of which 1,243,508 are cultivated, 377,722 cultivable, and 132,020 uncultivable and waste. The principal crops are wheat, barley, millet, gram, pulses, oilseeds, cotton, tobacco, etc. The manufactures are of the humblest kind, consisting chiefly of cotton and wool-weaving, and are confined entirely to the supply of local wants.

The Lahore and Ludhiána road runs for 51 miles through the district, and forms the chief trade route. The chief town and administrative headquarters of the district is Firozpur. The other important towns and seats of commerce are Mahrág, population 5681; Dharmkot, 5379; Moga, 4844; Muktsar, 4694; and Zira, 3010. The district revenue in 1872–73 amounted to £61,141, of which £49,713 was derived directly from the land. For the protection of person and property there are 12 revenue and civil and 13 magisterial courts, a regular police force of 388 officers and men, a municipal police of 75 men, and a rural constabulary of 542 men. For educational purposes 121 schools, attended by 3487 pupils, are maintained or subsidized by the state, at a cost of £1299. Owing principally to the dryness of its climate, Firozpur has the reputation of being an exceptionally healthy district. In September and October, however, after the annual rains, the people suffer a good deal from remittent fever. The average annual rainfall is 20·9 inches. British rule was first established at Firozpur in 1835, when on the failure of heirs to the Sikh family who possessed it, a small territory 86 miles in extent became an escheat to the British Government, and the present district has been gradually formed around this nucleus. Firozpur was the scene of operations during the first Sikh war. The Sikhs crossed the Sutlej in December, 1845, were defeated successively at Mudki, Firozsháh, Aliwál, and Sobráon; after which they withdrew into their own territory, and peace was concluded at Lahore. At the time of the mutiny, Firozpur cantonments contained two regiments of native infantry and a regiment of native cavalry, together with the 61st Foot, and two companies of European artillery. One of the native regiments, the 57th, was disarmed; but the other, the 45th, broke into mutiny, and, after an unsuccessful attempt to seize the magazine, which was held by the Europeans, proceeded to join the rebel forces in Delhi. Throughout the mutiny Firozpur remained in the hands of the English.

FIROZPUR, the civil headquarters of the district of the same name, also a military cantonment, is situated on the old bank of the Sutlej, in 30° 57′ N. lat. and 74° 10′ E. long. The city contains a population of 20,592, according to the census of 1868, of whom 7181 are Hindus, 11,171 Mahometans, 1347 Sikhs, and 893 "others." It has been constituted a municipality of the second class; municipal income in 1872–73, £4033; expenditure, £3962; rate of taxation per head, 3s. 10½d. Firozpur has rapidly advanced in material prosperity of late years, and is now a very important seat of commerce. The main streets of the city are wide and well paved, and the whole is inclosed by a low brick wall. Great improvements have been made in the surroundings of the city. The cantonment lies two miles to the south of the city, and is connected with it by a good metalled road. The garrison now consists of one regiment of British infantry, one of native infantry, one battery of field and one of garrison artillery. The arsenal to which Firozpur owes its political importance is situated one mile distant from cantonment. It is by far the largest in the province, and well stored with all munitions of war. The population of Firozpur cantonments and military lines amounted in 1868 to 15,837.

FISCHART (1546–1590), **JOHANNES**, the great German satirist of the 16th century, was born probably at Strasburg (according to some accounts at Mainz), in 1546, and was educated at Worms, in the house of Kaspar Scheid, whom he mentions in the preface to his *Eulenspiegel* as his "cousin and preceptor." After taking the degree of Doctor der Rechte at Basel in 1570, he left Germany for a time, and is said to have travelled in Italy, the Netherlands, France, and England. Having returned to Strasburg, he lived there from 1576 to about 1580 with his brother-in-law the printer, Bernhard Jobin, who became the publisher of most of Fischart's works. In 1581 Fischart became Advocat am Reichskammergericht at Spire, and in 1583 Hohenfelsischer Amtmann at Forbach, near Saarbrück. Here he died in the winter of 1589–90, at the age of forty-three. Fischart wrote under various feigned names, such as Mentzer, Menzer, Reznem, Huldrich Elloposkleros, Jesuwalt-Pickhart, Winhold Alkofribas Wüstblutus, and Huldrich Mansehr von Treubach; and it is partly owing to this fact that there is doubt whether some of the works attributed to him are really his. More than 50 satirical works, however, both in prose and verse, remain authentic, among which are—*Der Nachtrabe*, or *Die Nebelkräh* (1570), a satire against one Jacob Rabe, who had become a convert to the Catholic Church; *Von St. Dominici des Predigermönchs u. St. Francisci Barfüssers artlichem Leben* (1571), a poem with the expressive motto "Sie haben Nasen vnd riechens nit," written to defend the Protestants against certain wicked accusations, one of which was that Luther held communion with the devil; *Eulenspiegel Reimensweis* (1572); *Allerpraktik Grossmutter* (1572), after Rabelais's *Prognostication Pantagrueline; Flöhatz Weibertratz* (1574); *Affenteuerliche und ungeheuerliche Geschichtschrift vom Leben, Rhaten und Thaten, u. s. w., von Gargantoa u. Pantagruel,* also after Rabelais (1575, and again under a modified title 1577); *Neue künstliche Figuren Biblischer Historien* (1576); *Anmahnung zur christlichen Kinderzucht* (1576); *Das glückhaff Schiff von Zürich* (1576, repub. 1828 and 1849), a poem commemorating the adventure of a company of Zurich arquebusiers, who sailed from their native town to Strasburg in one day, and brought, as a proof of this feat, a kettleful of "Hirsebrei," which had been cooked in Zurich, still warm into Strasburg; *Podagrammisch Trostbüchlein* (1577); *Das philosophisch Ehzuchtbüchlein* (1578); the celebrated *Bienenkorb des heiligen römischen Immenschwarms,* etc., a modification of the Dutch *Bynencorf der roomischer kerke,* by Philipp Marnix of St. Aldegonde, published in 1579 and again in 1847; *Der heilig Brotkorb* (1580), after Calvin's *Traité des Reliques; Das vierhörnige Jesuiterhüttlein,* a rhymed satire against the Jesuits (1580); *Catalogus Catalogorum perpetuo durabilis* (1589). To Fischart also have been attributed some "Psalmen und geistliche Lieder" which appeared in a Strasburg hymn book of 1576. Fischart had studied not only the ancient literatures, but also those of Italy, France, the Netherlands, and England. He was a lawyer, a theologian, a satirist, in religion a staunch Protestant, in politics a republican. Above all, he is reputed a master of language, and was indefatigable with his pen. His satire was levelled mercilessly at all perversities in the public and private life of his time,—at astrological superstition, scholastic pedantry, ancestral pride, but especially at the papal dignity and the lives of the priesthood and the Jesuits. He indulged in the wildest witticisms, the most abandoned caricature; but all this he did with a serious purpose. Thirty years after Fischart's death his writings, once so popular, were almost entirely forgotten. Recalled to the public attention by Bodmer and Lessing, it is only quite recently that his works have come to be a subject of investigation, and his position in German literature to be fully understood. There is a collection of Fischart's works in the royal library at Berlin.

FISHER, **John**, bishop of Rochester, was born at Beverley in Yorkshire, but the year of his birth is uncertain, some placing it in 1459, others in 1461, and others in 1465. He was educated in the collegiate church of Beverley, and in 1484 he removed to Michael House in Cambridge, of which college he was elected master in the year 1495. Having applied himself to the study of divinity, he took orders; and becoming eminent as a divine, attracted the notice of Margaret, countess of Richmond, mother of Henry VII., who appointed him her chaplain and confessor. In 1501 he took the degree of doctor in divinity, and the same year was elected chancellor of the university. In the year following the first appointment of the newly-established Margaret professorship in divinity was conferred upon him; and in 1504 he was consecrated bishop of Rochester. Fisher has been erroneously credited with the composition of the *Assertio Septem Sacramentorum,* in which Henry VIII. attacked the heretic Luther, and for which the pope conferred upon his Majesty the title of "Defender of the Faith." Sir Thomas More and Fisher, however, published their respective rejoinders to the Reformer's reply to the king. Hitherto he had retained the friendship and esteem of the king; but from 1527 till his death he was acknowledged as, next to Sir Thomas More, the most influential man of the anti-royal or papal party in England. He published a pamphlet against the divorce of Catherine of Aragon, which was widely disseminated on the Continent, and also secretly circulated in England. In 1533 the parliament found him guilty of misprision of treason, for concealing certain prophetic speeches of Elizabeth Barton, a fanatical impostor known as the Holy Maid of Kent, relative to the king's death, and condemned him, with five others, to suffer loss of goods and imprisonment during his majesty's pleasure. He was subsequently released upon payment of a fine of £300. Fisher excused his silence on the ground that the nun had told him that she had communicated her prophecies to Henry in person, but he nevertheless refused to express regret for having been unwittingly connected with treasonable designs. As to the great question of the day, Fisher offered to swear to the succession in the line of Anne Boleyn's issue, but he refused to acknowledge either the validity of her marriage or the king's supremacy. For this refusal he was attainted by the parliament of 1534, and committed to the Tower. At this juncture Pope Paul III. sent him a cardinal's hat. This kindness, however, only hastened the bishop's ruin. He was beheaded at Tower Hill on the 22d of June, 1535. It is impossible to withhold from Fisher, notwithstanding his inflexible enmity to the Reformation, the character of a learned, pious, and honest man. His works attest his learning; his inflexible zeal for his faith, and the readiness with which he died for his creed, plainly prove his honesty as well as his piety. His execution was a sad tragedy, defensible only on the plea of political necessity. For the latest apology for Bishop Fisher, see the Rev. R. W. Watson's *History of the English Church,* vol. i., 1877.

Fisher was the author of a considerable number of controversial tracts, most of which were collected and printed in one volume folio, published at Wurtzburg in 1595. A Life of Fisher, by Rev. John Lewis, A.M., was published in 1855, in two volumes.

FISHERIES. Under the heading Sea Fisheries, which form the particular subject of the present article,[1] may be included the various operations engaged in for the capture of the different forms of marine life which, in some manner or other, minister to the wants or convenience of man. The most important of these fisheries—those only, in fact, to which the title strictly belongs, and which have more or less widely occupied attention from probably the earliest times—are carried on chiefly by hook and line or net, with the object of obtaining fish for the purposes of food; and this main division of the general subject will be here considered.

Importance of the industry.

Although little or nothing is known of the methods of fishing on our coasts in very early times, there can be no doubt that in England, as in all maritime countries, fish has always been eagerly sought after as an easily procurable article of food. The abundance of herrings and mackerel, for instance, on the coasts at regular seasons of the year, could not have failed to attract attention; and Swinden, in his *History and Antiquities of Great Yarmouth,* expresses his belief that the herring fishery began there soon after the year 495. In Scotland also there is evidence that the herring fishery was systematically carried on from a very early date. Precise records of other fisheries do not go back so far as that of the herring; but there is no reason for believing that cod and kindred fishes were not taken by the hook and line very many centuries ago, and, like the herring, were subjected to some ready mode of curing either with salt or by drying in the open air. In comparatively recent times all the fisheries have been largely developed, and none more so than that known as beam-trawling, a method of fishing which had probably attracted little notice a hundred years ago, but is now the most regularly productive and important on the English coast. Many circumstances have combined to encourage the working of sea fisheries as a national industry. The great extent of coast-line surrounding the British Islands provides ready access to the sea to a numerous population who become familiar from their youth with seafaring pursuits; and to such occupations large numbers betake themselves with instinctive aptitude, either as fishermen or sailors. In many cases early associations lead them to devote themselves to such fisheries as are within reach of their native villages; in others, they may become alternately sailors and fishermen, shipping for a few months every year on a trading voyage, and returning home in time to take part in the herring or some other temporary but profitable fishery; whilst in the case of the deep-sea trawling or cod fishery, they learn to become as good sailors as they are fishermen, for they have often to remain at sea in decked vessels for weeks at a time in all kinds of weather, —they must keep on their fishing ground, and must trust to their knowledge of seamanship to battle with the furious gales to which they may be at any time exposed when thus far away from shelter. Inducements to become fishermen are not wanting to this coast population. Nowhere are the best kinds of sea fish more abundant than in temperate and moderately high latitudes; and in this respect the British Islands are most advantageously situated, the sea surrounding them being frequented throughout the year by a variety of fishes always in request for the market, besides producing countless shoals of other kinds which only come within reach of the fishermen at particular seasons of the year. And great as may sometimes be the supply of fish during the continuance of favorable weather, it is rarely that the demand for it is exceeded at the present day; for all the markets of the country are brought within reach by the facilities provided for rapid transport from the fishing ports by the extensive system of coast and inland railways now in operation. Fishermen, therefore, always find a market for their produce; and although it is to be feared that many of them obtain but a small proportion of the price for which their fish is ultimately sold to the consumer, the majority of them are enabled to live more comfortably than formerly, and to save enough to keep their fishing gear in good working order, and in many cases to pay for improved and larger boats.

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[1] For Coral, Pearl, Salmon, Sponge, and Whale Fisheries the reader is referred to those headings.

Fluctuation of fisheries.

There is no doubt that the fisheries fluctuate a good deal from year to year; and it is often the case that they may be good on one part of a coast when they are bad on another. The important herring fishery on the coasts of Scotland is a marked example of this, as must be familiar to all persons who have given any attention to the subject. Thus it not unfrequently happens that when the fishery on the east side is particularly successful, a scarcity occurs on the west coast or *vice versâ*. Again, in some years, the fish are equally abundant or scarce on both coasts. These fluctuations are observed in even small districts of a line of coast, and one part of a season may be good and another bad in the same locality. Precisely the same variations occur on all the coasts of the British Islands, and with all kinds of fishes. Undoubtedly, weather is one of the most important elements in the question of success; and a generally stormy season has a marked effect in the diminished quantity of fish landed. It tells both in reducing the number of fishermen at work, and in driving the fish from their usual haunts. It is only quite recently that attention has been directed to the subject of temperature as affecting the movements of certain fishes towards or from the surface of the sea, and this will be further noticed when we speak of the herring fisheries. Apparently trifling circumstances may in some cases materially affect the catch of fish. Thus the sean fishery for pilchards on the coast of Cornwall has fluctuated exceedingly during the last 50 or 60 years for which returns are in existence; but however abundant these fish may be on the coast, the seans cannot catch them unless the shoals come quite close to the land in localities where these nets can be worked. Enormous hauls of pilchards have been made in particular years, whilst in others the fishermen have waited week after week without a chance of wetting their nets, although the drift-net fishermen at some little distance from the land have been meeting with fair success. The large apparent element of chance in the success of our fisheries cannot be better expressed than by the general hope of the fishermen for "good luck."

Transport of fish.

Great changes have taken place in the fishing trade within the last 20 or 30 years, more especially in that for fish sent fresh to the market. Excluding herrings and cod, which to a great extent were consigned to the curer as soon as possible after they were caught, a large proportion of the fish formerly taken on our coasts was disposed of within a short distance of the place where it was landed. A good many turbot and soles were forwarded by light carts or coaches to the nearest railways as these gradually extended in different directions from London; but the people near the coast were, a generation or two ago, the principal consumers of fish, and the supply was comparatively scanty, for the fishing boats were small, and there was little inducement to fish on a large scale when the markets within reach were so few. All this has been completely changed, and the main agent in the work has been the great extension of railways throughout the length and breadth of the land. Next to railways as a means of facilitating the transit of fish to all the markets, the use of ice for packing the fish has become of great importance, so much so in fact that without its employment it would be impossible to carry on the North Sea trawl fishery during summer at the distance from land at which it is generally worked, and where some of the most productive grounds are situated. Its special importance in this fishery will be further noticed when we speak of the general system of beam-trawling; but we may here mention that without the use of ice a large proportion of the fish now sent long distances by railway would never reach their destination in a condition fit for the table. The idea of using ice in connection with the fish trade was first put into a practicable shape by Mr. Samuel Hewett. At the present time about 30,000 tons of ice are imported annually from Norway into Hull, which is only one of the large North Sea trawling stations, for the sole purpose of preserving fish, either on board the fishing smacks or during its transit to market. With the exception of herrings, pilchards, and sprats, a large proportion of the fish now caught on the English coast is put into ice almost as soon as taken out of the water. Much of it is at once so packed on board the trawlers; it is brought on shore sometimes after several days, and sold in the wholesale markets; it is then repacked in ice and forwarded to other markets, where it is purchased by the fishmongers, who have a stock of ice at home ready to receive it; and there it remains, if properly taken care of, till wanted, sufficient only to make an attractive display being laid out at one time for sale.

Use of ice in packing.

Continuance of supply of fish.

The question of how long our present large supply of sea fish is likely to continue is one of much interest, and the answer to it depends on whether or not our fisheries are carried on in such a manner as to cause more destruction of fish life than can be compensated for by the vast reproductive powers of those fishes which escape the nets and hooks of the fishermen. For more than fifty years past the cry has been periodically raised that our fisheries are being ruined. The general complaint has been of the wasteful destruction of spawn and very young fish by beam-trawling and sean nets; and in 1863 the outcry was so loud that a Royal Commission was appointed, not only to examine this question, but also to inquire into the general condition of all our sea fisheries,—the special objects of inquiry being the state of the supply of fish, and the questions whether the methods of fishing in use involved a wasteful destruction of fish or spawn, and whether existing fishery restrictions operated injuriously on the fisheries. On these points the commissioners, after taking evidence all round the British Islands, were enabled to give a very decided opinion. They reported that the supply of fish generally had largely increased, that the methods of fishing involved no waste of young fish that could be prevented without interfering with the general fisheries, that spawn was not destroyed by the nets, and that all fishery restrictions should be removed except such as were desirable for protecting and keeping order among the fishermen. The recommendations of the commissioners were embodied in an Act of Parliament known as The Sea Fisheries Act, 1868, by which, with one or two small exceptions relating to herring fishing on the west coast of Scotland, previous Fishery Acts were repealed, and fresh regulations made having reference to the registration of fishing boats, keeping order among drift-fishermen and beam-trawlers, and providing a close time for oysters in the English Channel. The main object of the Act was to carry out a convention between the British Islands and France, for the better ordering of the fisheries in the seas adjoining the two countries. The Act came into force in England on the 1st of February, 1869, but circumstances have hitherto prevented any date being fixed for carrying out the convention on the part of the French. Great advantage has undoubtedly been gained by British fishermen from the substitution of the present simple fishery regulations for the numerous Acts previously existing, many of which had long been obsolete; but the Royal Commission, which was issued virtually to inquire into the alleged destruction of fish spawn on the ground by beam-trawlers, would probably have never come into existence had the facts then been known which have since come to light about the spawning habits of most of our edible fishes. These facts are so important that a short notice of them may be given here.

Investigations as to place of spawning.

Fishermen are in the habit of asserting with perfect confidence that fishes of almost every kind they are accustomed to catch have certain grounds which they frequent at particular seasons for the purpose of depositing their ova. The herring is known to spawn on the ground,—at all events the spawn is found there in irregularly shaped lumps adhering to the bottom. It has therefore been concluded that all kinds of fishes have the same habits in this respect. Yet no one has been able to speak positively of having ever seen any fish spawn taken from the ground except that of the herring. Various soft and gelatinous substances are brought on shore by the sean nets, and commonly go by the name of spawn among the inshore fishermen; but that they are not fish spawn is perfectly well known to any one who has given attention to the variety of curious animal organisms inhabiting the sea.

It was stated by Professors Huxley and Allman in 1867, before the select committee of the House of Commons on the Sea Coast Fisheries (Ireland) Bill, as within their personal knowledge, that fish ova had been found floating at the surface of the sea, and that the ova they had met with were in all cases alive, and some of them in an advanced state of development. Reference was at the same time made to the observations then recently recorded by Norwegian naturalists on the spawning habits of the common cod, leading to the belief that spawning at the surface was by no means uncommon with our sea fishes. These investigations have been systematically carried on during the last ten years, under the direction of the Swedish Government, by Professor G. O. Sars of the university of Christiania, and have resulted in some unexpected discoveries. The seas in the neighborhood of the Loffoden Islands on the coast of Norway had long been known to be a great place of resort for cod during the spawning season; and in 1864 Professor Sars commenced his work there, and by means of a small surface towing net he obtained plenty of the ova of the common cod (*Gadus morrhua*) floating at the surface; examples in various stages of development were procured, the young fish were successfully hatched out, and the species identified beyond a doubt. Subsequent observations fully confirmed the accuracy of the conclusions previously arrived at that the cod spawn was not deposited on the ground but floated freely at or near the surface. In 1865 the same observations were made on the ova of the haddock (*Gadus æglefinus*), and it was satisfactorily proved that they went through all their stages of development while floating at the surface, in precisely the same manner as in the case of the cod. Sars was at first inclined to believe this development of the ova while floating was peculiar to the members of the *Gadidæ* or cod family, in its restricted sense; but in the summer of 1865 he visited the southern coast of Norway during the season for mackerel, and found abundant evidence of the same rule obtaining in that widely distinct fish. In the case of the mackerel, the spawning actually takes place at the surface; but with the cod family we believe the operation has not been so distinctly observed. The ova, however, are undoubtedly met with at the surface and at a short distance below it. Entirely subversive as these discoveries of Professor Sars are of the popular notions about fish-spawning, it is even more unexpected to find that both he and M. A. W. Malm of Gothenburg have independently ascertained that the ova of that essentially ground-fish the plaice (*Pleuronectes platessa*) follow the same rule of floating at the surface. Other kinds of floating ova were also obtained by Sars, some of which he succeeded in hatching; and he has completely identified the gurnard (*Trigla*) and the garfish (*Bellone*), in addition to those before mentioned. It is evident, then, that the floating of fish ova during the development of the embryo must be taken as the general rule in several large and distinct families of sea fish. Sars has pointed out that the development takes place at the bottom in the case of those fishes especially whose ova are cemented together by a glutinous secretion, or fastened in lumps to foreign bodies, such as Algæ, Hydroids, etc. He mentions as examples of this, among others, the herring (*Clupea*), the capelan (*Osmerus*), the species of *Cottus*, *Liparis*, etc.

It is particularly worthy of notice that, according to these observations of the Norwegian naturalists, all the important kinds of fish taken by our line fishermen and beam-trawlers, and the mackerel among such as are caught by the drift-nets, may be reasonably included among the species whose spawn floats at or near the surface of the sea, and their ova cannot therefore be liable to the slightest injury by any method of fishing which is carried on upon or near the ground. For if that be the rule with the spawn of the cod and haddock there can hardly be a doubt about its being so likewise with the ova of ling, coal-fish, whiting, pollack, hake, and that northern species, the tusk, all belonging to the same family. Again, turbot, holibut, brill, soles, plaice, dabs, and flounders are all closely allied, and there can scarcely be a doubt that the same rule applies to all which Sars and Malm have established in the case of the plaice, one of the most typical of this group of fishes. The gurnard family must also be included in this category; the spawn of the red mullet, we believe, has been observed floating in aquariums; and the dory, from its close affinity to the mackerel, may be expected to follow the same rule. On the other hand, we know that the spawn of the herring is commonly found at the bottom, although it by no means follows that the parent fish is there when the ova are excluded; for the full herring is frequently taken in drift nets which are very near the surface, and these nets are often covered with small lumps of spawn. At the same time the specific gravity of herring spawn is greater than water, and it sinks to the bottom sooner or later if nothing intercepts it. There is no evidence of its ever floating at or near the surface as is the case with that of the cod. In fact, the aggregation of the ova into masses of various sizes, and the glutinous substance in which the ova are embedded, by which they are enabled to adhere firmly to anything with which they may come in contact, point to their remaining in a fixed position during the process of development. It might have been anticipated that the other members of the herring family—the pilchard and sprat, for instance—would also have spawned on the ground, but, so far as we are aware, their ova have never been found there. Indeed, nothing is known of the spawning habits of the sprat, although this little fish has the roe well developed in December or January, when it is found in the greatest abundance on our coast, and comes nearest to the shore. The spawning of the pilchard is a matter of some little interest. The late Mr. Jonathan Couch, who probably devoted more time to the study of the habits of this fish than any other ichthyologist, states[1] his belief that the pilchard spawned at the surface, and the ova became mixed with a large quantity of tenacious mucus which spread out like a sheet on the water and kept them floating. If this should be confirmed, it will prove that even in the case of agglutinated masses of ova, development may naturally take place in them far away from the bottom. There appears to be little doubt that the pilchard spawns far out at sea, as they are on chance occasions taken in spawning condition in the mackerel drift-nets early in the year; and when, some months later, the shoals of pilchards approach the land the roe shows no signs of development. These circumstances favor the idea that pilchards are surface spawners, as believed by Mr. Couch.

Vitality of spawn.

There are several other kinds of edible fish of whose spawning habits we have no definite knowledge, but enough has been discovered of the habits of most of the fish which are valuable for the purposes of food, to show that there need be no anxiety about their spawn being destroyed by any of the methods of fishing in ordinary use. The only apparent exception to this statement is in the case of the herring, whose spawn it has been alleged has been destroyed by the beam-trawlers. But if the beam-trawlers wish to avoid tearing their nets in pieces, they must work where the ground is smooth; and in the few precise localities where it has been positively ascertained that the herring does spawn, the general character of the bottom is rough. That is the ground specially worked over by the line fishermen for haddock, cod, turbot, and other fishes, which come there in numbers for the sake of feeding on the herring spawn. There is a popular idea that all fish spawn is of a most delicate nature, and quickly loses its vitality if taken out of the water for a short time, or at all knocked about. This is probably true in those cases in which the ova are separated from each other after exclusion, and float freely in the water; but it is not so with the spawn of the herring, or probably of other fish whose ova are embedded in a tenacious mucus. The experiments of Professor Allman and of Dr. M'Bain have shown that herring spawn does not readily lose its vitality under rough treatment, and may even be hatched out after having been exposed to most unnatural conditions. Professor Allman states in his Report to the Board of Fisheries at Edinburgh that some stones covered with spawn were taken from the sea by divers on the 1st of March, 1862, not far from the Island of May. Some of this spawn was forwarded to him, and came into his possession after being kept in only a small quantity of water for two entire days. He says:—

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[1] *History of British Fishes*, vol. iv. p. 81 (1865).

> "With the view of determining whether development would proceed in confinement, I placed some of this spawn in a glass jar with sea-water, exposing it in a window looking to the east. The several stages of development were regularly passed through, and on the 15th of March the embryo was fully formed, energetic movements were performed by it in the ovum, and it seemed ready to escape into the surrounding water. On the 16th some of the embryos had actually escaped, and were now about four-tenths of an inch in length. They were of crystalline transparency, and swam about with great activity, and with the remains of the yolk, reduced now to a very small volume, still adhering to them. The specific characters had, of course, not yet become established, and the little fish afforded no further evidence, beyond what we already possessed, to enable us to identify it with the young of the herring."

The young fish lived nearly a month in confinement, but the specific characters were not even then sufficiently perfected to identify the fish with certainty. There could be no reasonable doubt, however, that the spawn was that of the herring. After some account of other discoveries of spawn, he thus concludes his report:—

> "It was shown by these experiments that the vitality of the spawn was in no way injured by detaching it from the spawning bed, so that if it be returned to the sea before it suffers any prolonged exposure to the air, development will proceed apparently unchecked. Those specimens, indeed, which underwent development in my possession, had not only been removed from the ground, but had been kept for many hours in a scanty supply of water before I received them; and even after they came under my care, they were necessarily placed in conditions very different from those to which they would have been exposed if they had been allowed to remain in their natural habitat,—and yet, with all these disadvantages, development proceeded uninterruptedly."

Registration of vessels.

Registration of Fishing Vessels.—Under the Sea Fisheries Act, 1868, all vessels and boats engaged in fishing for the purpose of sale must be registered at the custom-house, and must be marked on the bow with letters denoting the port to which they belong, and their registered number. Thus, Grimsby is represented by the letters G Y, Peterhead by P D, and Galway by G. The fishing boats are divided into three classes,—the first class including everything of 15 tons and upwards, the second class all boats under 15 tons navigated otherwise than by oars only, that is, sometimes by sails and sometimes by oars, and the third class those with which oars only are used. The last class is supposed to include only small boats used for harbor fishing;[1] but as there are very few boats in which a sail of some kind is not sometimes hoisted, the customs have a discretionary power to put very small boats into the third class, notwithstanding their occasional use of a sail. The registers for each port are sent to the registrar-general of shipping, and appear in the annual returns published by the Board of Trade. There is great difficulty, however, in obtaining precise accuracy in the returns for many parts of the coast; new boats sometimes escape registration, and boats which have been lost or broken up sometimes remain for a year or so on the list. But, imperfect as these returns undoubtedly are, they are of some value in giving an approximate idea of the number of the fishing craft, and of the average size of those in the first class. It must be remembered, however, that this class includes boats ranging from 15 tons to 70 or 80 tons. The tendency now is to fish farther from the land than formerly, and to use decked instead of open boats; the result is that there is a steady increase in the first class boats, and a diminution in the number of the smaller ones. The preceding table gives the total number of fishing boats in England, Scotland, Ireland, and the Isle of Man on the register for 1876 and 1877, arranged according to their classes.

	Years.	First Class.		Second Class.	Third Class.
		Boats.	Tonnage.	Boats.	Boats.
England........	1876	3,142	121,445	8,777	2,890
	1877	3,425	137,768	7,825	2,044
Scotland.......	1876	2,782	47,743	9,888	1,470
	1877	2,940	51,039	9,326	1,303
Ireland.........	1876	393	9,364	2,802	2,949
	1877	405	9,861	2,817	3,002
Isle of Man...	1876	235	5,017	107	41
	1877	254	5,446	123	11
Totals........	1876	6,552	183,569	21,574	7,350
	1877	6,770	198,668	19,968	6,349

We will now proceed to give an account of the several valuable fisheries carried on around the coasts of the British Islands, with some details of the appliances in use, and the manner in which they are worked.

English Fisheries.

English Fisheries.—On the coast of England the methods of fishing in general use are more numerous than in the case of either Scotland or Ireland, the fishing-grounds are more extensive, and the total supply of fish obtained is larger and more varied in kind. The principal modes of fishing are by the beam-trawl, the drift-net, the sean, the stow-net, and lines. Their relative importance varies to some extent, but trawling and drift-net fishing occupy by far the most conspicuous positions, and lines come next in order.

Trawling.

Trawling.—The most characteristic mode of fishing is that known in England as "trawling," or in Scotland as "beam-trawling," and consists in towing, trailing, or trawling a flattened bag-net, often 100 feet long, over the bottom in such a manner as to catch those fish especially which naturally keep close to or upon the ground. It is very desirable that the name "trawl" should be restricted to this net, presently to be described, as much confusion has been caused by the practice, general in Scotland (which has misled even such writers as Mr. Couch, see *Fishes of the British Islands*, iv. 105), of applying the name to that very different kind of net which has for centuries past been almost universally known as the "sean," or "seine," or "seyne," and may be traced back through the Saxon *segne* to the Latin *sagena*, a sweep-net. In the United States and Canada the word "trawl" is still more misapplied, being given to what is in England commonly called the long line or bulter.

The beam-trawl.

The beam-trawl may be simply described as a triangular, flat, purse-shaped net, with the mouth extended by a horizontal wooden beam, which is raised a short distance from the ground by means of two iron frames or heads, one at each end, the upper part of the mouth being fastened to the beam, and the under portion dragging on the ground as the net is towed over the bottom. The beam, of course, varies in length according to the size of the net, and depends to some extent also on the length and power of the vessel which has to work it. In the large "smacks," as the trawl-boats have long been called, the beam ranges from 36 to 50 feet in length; and there is rarely anything less than this now used by the deep-sea trawlers. Elm is generally preferred for it, selected, if possible, from timber grown just of the proper thickness, that the natural strength of the wood may not be lessened by more trimming or chipping than is absolutely necessary. If the required length and thickness cannot be obtained in one piece, two or even three pieces are scarfed together, and the joints secured by iron bands. When the trawl is being hoisted in, the first part of the apparatus taken on board is the large heavy beam, and this is very commonly done when the vessel is rolling and pitching about in a seaway. It is therefore necessary for the sake of safety that the beam should be secured as soon as possible, and in such a position as to be out of the way and at the same time conveniently placed for lowering again when required. All this may be easily effected by having the beam of such a length in proportion to the size of the vessel that when hoisted up, one end of it may come over the taffrail, with the iron head just clear outside, and the fore end in front of one of the shrouds. It then lies on the gunwale of the vessel, and the ends are secured by ropes, the forerigging preventing that end of the beam coming on board, but the iron head passing in between the shrouds. The object or use of the beam is to extend the mouth of the net; but, in order to allow room for the fish to enter, the beam, and with it the back of the net which is laced to it, must be raised a certain distance from the ground. For this purpose the beam is fastened at each end to the top of an iron frame, shaped somewhat like an irregularly formed stirrup, which is fitted to it at right angles by a square socket at the top. By these "heads or irons" the beam is supported at a height of nearly 3 feet from the ground, and, contrary to the popular idea on the subject, never touches the bottom. It could only do so if the trawl were to reach the ground with its back undermost, and then the mouth of the net would close, and no fish could enter. The lower part of the trawl-head or iron is straight and flat, just like the corresponding part of a stirrup. It is called the "shoe," and is the part which slides over the ground as the trawl-beam and following-net are towed along. There is a slight variation in the form of the trawl-irons, and one, known as the Barking pattern, from having been adopted at that old trawling-station on the Thames, is shaped exactly like a stirrup; but generally the irons are preferred with the aft side straight. We now have the long beam supported at each end by a more or less stirrup-shaped iron fitted at right angles. The next thing to be considered is the net. This was previously spoken of as flattened and purse-shaped. When the net is spread out in the manner it would be when working, the upper part or back has its straight front edge fastened to the beam, but the corresponding lower part or belly is cut away in such a manner that the front margin forms a deep curve extending from the shoe of one trawl-head to the other, the centre of the curve or "bosom," as it is called, being at a considerable distance behind the beam. The usual rule in English trawls is for the distance between the beam and the bosom to be about the same as the length of the beam. In French trawls this distance is generally much less; but in all cases the beam and back of the net must pass over a considerable space of ground when the trawl is at work before the fish are disturbed by much of the lower margin of the net. This lower edge of the mouth of the trawl is fastened to and protected by the "ground-rope," which is made of an old hawser "rounded" or covered with small rope to keep it from chafing, and to make it heavier. The ends of the ground-rope are fastened at each side by a few turns round the back of the trawl-heads, just above the shoe, and the rope itself rests on the ground throughout its entire curve. The fish which may be disturbed by it have therefore no chance of escape at either the sides or back of the net, and as the outlet under the beam is a long way past them, and is steadily moving on, their fate is sooner or later decided by their passing over the ground-rope and finding their way into the funnel-shaped end of the net, from which a small valve of netting prevents their return. The ground-rope is the part which directly bears on the ground, and to prevent the possibility of the fish passing under it, the rope should have some weight in it so as to "bite" well, or press the ground closely. It is, however, always made of old material, so that it may break in case of getting foul of rocks or such other chance obstruction as may be met with on the generally smooth ground where the trawl can only be worked with advantage. If in such a contingency the rope were so strong and good as not to break, there would be serious danger of the tow-rope snapping, and then the whole apparatus might be lost; but the ground-rope giving way enables the net to be cleared and hauled up with probably no more damage to it than the broken rope and perhaps some torn netting. The remaining part of the trawl, extending from the bosom to the extreme end, forms a complete bag gradually diminishing in breadth to within about the last 10 feet, which part is called the "cod or purse," and is closed by a draw-rope or "cod-line" at the extremity when the net is being used. This is the general receptacle for the various fishes which enter the net; and when the trawl is hauled up and got on board the vessel, the draw-rope is cast off and the fish all fall out on the deck.

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[1] By a recent order in council all open fishing boats which do not fish beyond three miles from land are exempted from registration. This practically abolishes the third class which has hitherto appeared in the returns.

The net.

Pockets.

We must now say a few words about the ingenious contrivances for preventing the escape of the fish which have entered the purse and reached the farthest extremity of the net. It has been mentioned that the body of the net tapers away to the entrance to the purse. It is at this point the opening of the pockets are placed; and they are so arranged that the fish having passed into the purse, and then seeking to escape by returning along its sides, are pretty sure to go into the pockets, which extend for a length of about 15 or 16 feet along the inner side of the body of the net, and there, the more they try to press forward, the more tightly they become packed, as the pockets gradually narrow away to nothing at their upper extremity. These pockets are not separate parts of the trawl, but are made by merely lacing together the back and belly of the net, beginning close to the margin or side nearly on a level with the bosom, and then carried on with slowly increasing breadth downwards as far as the entrance to the purse. At this point the breadth of the net is divided into three nearly equal spaces, the central one being the opening from the main body of the net into the purse, or general receptacle for the fish, which must all pass through it, and those on each side being the mouths of the pockets facing the opposite direction. The central passage has a valve or veil of netting called the "flapper," which only opens when the fish press against it on their way into the purse. To understand clearly the facilities offered to the fish to enter the pockets, it is necessary to remember that the trawl, when at work, is towed along, with just sufficient force to expand the net by the resistance of the water. But this resistance directly acts only on the interior of the body of the net between the pockets and then on the purse; it does not at first expand the pockets, but tends rather to flatten them, because they are virtually outside the general cavity of the trawl, and their openings face the further end of it. The water, however, which has expanded the body of the net, then passes through the flapper or valve, and enters the purse, which, being made with a much smaller mesh than the rest of the net, offers so much resistance that it cannot readily escape in that direction; return currents are consequently formed along the sides, and those currents open the mouths of the pockets, which, as before mentioned, are facing them; and the fish, in their endeavors to escape, and finding these openings, follow the course of the pockets until they can go no farther. The whole of the net is therefore well expanded, but it is so by the pressure of the water in one direction through the middle, and in the opposite direction at the sides or pockets.

Meshes.

The meshes of an ordinary deep-sea trawl vary in size in different parts of the net, diminishing from 4 inches square near the mouth to 1½ inches in the cod or purse. The under part of the net, being exposed to more wear and chafing than the upper, is usually made with rather stouter twine; and the purse, being especially liable to injury from being dragged over the ground with a weight of fish and perhaps stones in it, has some protection provided by layers of old netting called "rubbing pieces" laced to its under surface. The French fishermen frequently fasten a stout hide to this part of their trawls with the same object.

A deep-sea trawl, such as has now been described, is therefore an immense bag-net, the largest size being about 50 feet wide at the mouth and about 100 feet long. Many of these nets are much smaller, some of them not having the beam more than 36 feet or even less, and the net reduced in proportion; but there has been a great increase in the size of the trawl-vessels in recent years, and at the same time there has been an enlargement of the nets, although not quite in the same ratio. The trawl is towed over the ground by the trawl-warp, generally a 6-inch rope 150 fathoms long, and made up of two lengths of 75 fathoms each spliced together; one end of this warp is shackled to two other pieces each 15 fathoms long, and called the "spans or bridles," which lead one to each end of the beam, and are shackled to swivel-bolts in front of the iron heads so as to give a fair pull on the whole apparatus.

Size of trawl vessels.

The great development of the trawl fishery in recent years has led to a vast improvement in the kind of fishing vessels employed in it. Fifty years ago the only deep-sea trawlers were in the west of England, and from Barking on the Thames. They were not nearly the tonnage of many of the vessels now used in the North Sea, but were stout, heavy, seagoing craft of their size, and capable of standing almost any description of weather; and, although comfortable, they were certainly not very fast. At that date, however, the fish went into consumption at once, instead of being sent one or two hundred miles before it reached the consumer. The increased demand for fish of late years has led to the building of trawlers of the best description, as remarkable for their fast sailing as for other improved qualities. There is racing home now from the fishing grounds to catch the first of the market, and everything is done as quickly as possible to ensure quick distribution and delivery all over the country. The cost of the vessels has of course largely increased, not only from their greater size, but also because of the much higher price now paid for everything used in their construction. In 1862 a new trawl vessel, and what was at that time considered one of the larger class, could be built and fitted out ready for sea for £700 or £800; but it costs from

£1200 to £1300 to turn out one of the vessels now commonly used in the North Sea fishery. This includes a supply of everything necessary for fishing, costing about £70 or £80. A proper fit-out consists of a double set of almost every part of the gear, so as to provide against accidents, and generally to save the time which would be lost if the trawler were obliged to return to port before he had done a fair quantity of work. A trawl-net will perhaps last from two to four months, according to the nature of the ground worked upon; but during that time parts of it will have to be renewed. The back of the net, being exposed to the least wear, lasts the longest; the under part will generally require renewing twice, and the cod or purse five or six times, before the net is finally condemned. The additional size now given to the trawl-vessels has led to an alteration in the manner in which they are rigged. The term "smack" has been for a long time applied to those trading and fishing craft which were cutter rigged, and until quite recent years all the trawlers were known as trawl-smacks. It was a convenient rig; the single mast was stepped well forward so as to allow of a large and powerful mainsail, at the same time giving plenty of free space on deck for getting in the net, and stowing it and the long trawl-beam on the top of the bulwark when not at work. But when the size of the vessels was increased to 70 or 80 tons, it was found that the mainsail, enlarged in proportion, wanted a good deal more looking after in bad weather than was convenient, and the heavier main-boom caused a great deal of straining. More hands became necessary on this account than were required for ordinary fishing purposes, and the increased expenses interfered with profitable working. The new trawl-boats were therefore built of greater length, so as to provide room for a small second mast or mizen on which a gaff-sail could be carried, and thus something could be taken off the large mainsail. The result has been very satisfactory; just as much sail is carried as before, but it is not so lofty, and being divided into smaller pieces, it can be handled with greater ease and safety. As a gaff-sail is carried on the mizen, the rig is that of a ketch; had a lug-sail been used instead of a gaff-sail, the vessel would have been what is called "dandy-rigged." The increased length of the vessel in proportion to her size gives many advantages. Space is provided for packing away a considerable quantity of ice, which is a very necessary article in the present mode of working the North Sea trawl fishery; the produce of many fishing days can be properly stowed away and preserved in good condition, and the crew have more roomy and comfortable accommodation,—a point of importance, since at certain seasons they remain at sea for several weeks at a time.

Barking.

"Barking" the sails is a regular practice with the trawlers, as it is with most other fishermen in England and Scotland. The process consists in mopping them over with a composition of a solution of oak-bark, tar, grease, and ochre, which acts as a good preservative of the canvas. This is done once in six or eight weeks, and a suitable place is kept for the purpose at all the important fishing stations.

Working the trawl.

Working the beam-trawl requires some little skill which can only be acquired by experience at sea. A knowledge of the ground and of the direction and times of the tide is essential; for the trawl is towed with the stream, a little faster than it is running, so that there may be just sufficient resistance from the water to expand the net. If it were towed too fast, the pressure of the water against the long transverse beam would tend to lift it from the ground, and then the fish would not enter the net. This important point is regulated by a nice adjustment of the length of tow-rope to the force of the wind and state of the sea; and experience enables the fisherman to tell, by pressing the hand firmly on the warp between the vessel and the water, whether or not the trawl is working steadily over the ground. Lowering the trawl to the bottom is also a matter requiring great care, so that it may reach the ground with the beam above the iron heads and the ground-rope in its proper position below. This can only be managed by first getting the whole apparatus in a proper position at the surface, and then keeping the vessel slowly moving through the water whilst the lowering takes place. If, as sometimes happens in spite of all precautions, the net and beam should twist round while being lowered, and the apparatus should reach the bottom with its back downwards, then the beam would be on the ground and the iron supports above, the mouth of the net would close, and no good could be done with it. The only thing for the fishermen to do under such circumstances is to haul up the trawl and shoot it again. The popular idea that the beam is always dragging on the ground is therefore a mistaken one. The trawl is shot at the beginning of the tide, so that it may be towed for five or six hours, and during that time it will probably pass over from fifteen to twenty miles of ground. As trawlers when engaged in fishing are practically anchored by their trawls, they cannot readily get out of the way of vessels meeting them, and the law admits this view of the case by obliging them at night to carry a single mast-head light as an anchor light, instead of the regulation red and green side-lights for vessels under sail.

When the tide has finished, or the smack has reached the end of its fishing ground, the trawl is hauled up by a winch or capstan. This seldom takes less than three-quarters of an hour in fine weather, and two or three hours if it be rough. The beam is got alongside, and hoisted up and secured; then the net is gathered in, the cod or end of the bag being hoisted in by a tackle, and the cod rope closing the end being cast off, the whole catch of fish falls out on deck. The fish are immediately sorted and packed away, and the fishermen prepare for another haul, according to the state of the wind and tide.[1]

Varieties of trawl-fish.

Trawl-fish are separated for market purposes into two great classes, known respectively as "prime" and "offal." Prime includes turbot, brill, soles, dories, and red mullet, the last being caught in large numbers in summer, especially by the Brixham trawlers. Offal is the name given to plaice, haddocks, whiting, and other kinds of inferior fishes which are caught in great abundance, and usually sell at a low price. The term "offal" was applied to these fish at a time when railways had not come into existence, and purchasers frequently could not be found for the quantity of fish the trawlers would bring to market in one day. This was especially the case with plaice and haddocks when the newly discovered fishing grounds in the North Sea were first worked. A good deal of fish was then wasted, and thousands of haddocks were thrown overboard again as soon as caught, for the fishermen were under orders not to bring ashore more than were likely to be sold whilst fresh. Even in comparatively recent years trawled haddocks were of little value, until the practice of smoking them, as had long been done in Scotland, was adopted at Hull, Grimsby, and other places; and now not a haddock is thrown away if it is in good condition when landed. It may be mentioned that round-fish, such as haddock and whiting, always suffer more or less in appearance when caught by the trawl, as they are liable to be knocked about by the crowd of fish in the small end of the net, especially when the trawl is being hauled up. They do not therefore fetch a good price in the wholesale market, whilst haddock and whiting caught by the hook are always in demand, and it need hardly be mentioned that the Scotch haddock, so long famous for their excellence, both fresh and cured, are all caught with hook and line.

Trawling stations.

Plymouth.

The trawling stations in the west of England are Plymouth, and Brixham in Torbay, and this method of fishing has been carried on from both places for probably upwards of 100 years, although the date of its commencement has been by no means accurately ascertained.[2] It is certain, however, that at the beginning of the present century the trawlers were comparatively few, and not half the size of those now at work. Plymouth does not appear to have progressed so steadily in later years as Brixham, and this may be partly caused by the more frequent interruptions from bad weather at the western port. The south-westerly gales so common in

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[1] Fuller details of the mode of working the beam-trawl will be found in *Deep Sea Fishing and Fishing Boats*, London, 1874.

[2] Froude, in his *History of England*, vol. xii. p. 397 (cabinet edition, 1870), speaks incidentally of trawlers at Brixham so long ago as the time of the Spanish Armada. In his description of the English attack on the Spanish fleet, he says:—"Drake, returning from the chase, came up with her [the "Capitana," the admiral's disabled ship] in the morning. She struck her flag, and he took her with him to Torbay, where he left her to the care of the Brixham fishermen. . . . The prize proved of unexpected value. Many casks of reals were found in her, and, infinitely more important, some tons of gunpowder, with which the 'Roebuck,' the swiftest trawler in the harbor, flew in pursuit of the fleet." The "Roebuck" is spoken of, in another account of the attack, as Sir Walter Raleigh's ship, and therefore, no doubt, an armed vessel; and we have been unable to find any evidence of there having been trawlers at Brixham at that date (1588).

Brixham.

winter are felt in all their violence on the fishing ground of Plymouth, and the heavy sea accompanying them sometimes puts a stop to fishing for two or three days at a time. The custom also at Plymouth of only fishing during the day and returning to harbor every evening must materially diminish the chances of the fishing being very profitable, and for some few years past the number of trawl vessels has not averaged more than about 60. At Brixham, where trawling is believed to have originated, and fishing has always been the chief industry, much more enterprise is shown. The trawlers there go to sea on Monday morning and remain at work till the next morning, when they return and land their fish. After an hour or so they again go off, and fish day and night till the next morning, and so on every day till Saturday comes, when, having landed their fish, they come to anchor, get their sails down, and spend the rest of the day in mending their nets and putting everything in order for the next week's work. Sunday is a day of rest for all hands.

The history of the Brixham fishery has a very important bearing on the charges that have been brought against the trawlers of destroying spawn and very young fish, and of gradually exhausting the fishing grounds on which they worked. The Brixham men, as a rule, keep to a particular stretch of fishing ground, extending from the Start Point, past Torbay, towards the neighborhood of Portland,—practically about twenty miles long and of variable breadth, but mostly from three to eight miles off the land. There is no record of how many trawlers there were at Brixham at the beginning of this century, but it is known that they were few and less than half their present size. In 1852, however, there were 70 of them, 85 in 1863, and in 1872 their number was about 100, besides 20 others which worked on this home ground during the winter; and new vessels are being built every year, not only to make up for losses, but to add to the fleet. This small strip of fishing ground has certainly been worked for more than a hundred years, the fishing smacks have been steadily increasing in number and have more than doubled in size, and yet there is no sign of the ground becoming exhausted. The greater demand for fish has no doubt encouraged the fishermen in their work, for they have obtained better prices for their fish; but if the effects of trawling were the exhaustion of the fishing ground, the Brixham fishery should have come to an end many years ago. It has, however, never been so prosperous as during the last few years. Every one at Brixham is more or less interested in the success of the fishing; the actual condition of the fishery is generally understood, and the savings of the fishermen and many of the trades-people of the place are invested in it year after year. The trawlers do not work for weekly wages, but on the share principle, and the master is generally owner or part-owner of the vessel. It is consequently the interest of every one on board to do his best to make a successful fishing, and the fact of the owner being in command insures due attention to economy in working, so that, whilst no necessary expense is spared in keeping the sails and gear in proper order, everything is made to last as long as possible.

Hull.

Brixham has been long considered the "mother-port" of the trawlers, the place where the system of beam-trawling originated; but although Barking, once famous as a fishing station, disputes the honor with her, there is no doubt that Brixham men have led the way in developing this particular method of fishing to its present large proportions. More than forty years ago some of the Brixham vessels went to Ramsgate and fished the grounds at that end of the Channel. Others joined them and permanently settled there, and now there are upwards of 160 sea-going trawlers belonging to the port. Ten years later Hull was colonized from Brixham and Ramsgate, and Grimsby from Hull at a subsequent period; whilst as early as 1818, Brixham smacks and fishermen passed over to Dublin to commence deep-sea trawling in Irish waters. The important rise of Hull as a trawling station dates from 1845, soon after the discovery of the famous Silver Pit, at the south end of the Dogger Bank. Before that time the number of North Sea trawlers was very small; they were only of about half the size of most of the smacks at present; and not enough was known of the fishing grounds to tempt the fishermen so far from land in vessels of such little power. For a long time, however, the line fishery for cod and haddock had been carried on in the neighborhood of the Dogger, but in vessels specially constructed for the purpose. The Great Silver Pit, so called to distinguish it from a smaller Silver Pit much nearer the land, was first worked over during a very severe winter,—we believe, in 1843. Two fishing grounds called the Well Bank and Botany Gut had been explored and discovered to be very productive; and between them and the Dogger, and bearing true east from Flamborough Head, the Admiralty chart showed a bed of deeper soundings, ranging in some parts from 30 to 40 fathoms, and the whole extending for about sixty miles east and west, and from six to ten miles in breadth. The patch was marked "Outer Silver Pit," and on trying it with the trawl, in the deeper parts at the western end and near the middle, soles were found during that very cold season in almost incredible numbers; the nets were hauled up bristling with fish trying to escape through the meshes, and such enormous catches were made as the most experienced fishermen had never before thought possible. Of course it was not long before this remarkable discovery became known, and a migration of trawlers from Brixham and Ramsgate soon took place to Hull as a convenient station from which to work on this promising ground. With the breaking up of the cold weather, however, this extraordinary congregation of soles became dispersed; but more attention was from that time directed to the North Sea fishing generally, and in after years the Silver Pit has again been found very productive whenever the winter has been very severe, or, as the trawlers call it, in "pit seasons." The fact of temperature affecting the distribution of many kinds of fish, shown in such a marked manner in this particular case, is now receiving systematic attention from the Meteorological Society of Scotland in connection with the herring fisheries, and very important results have apparently been obtained from an inquiry into the same subject on the coasts of Nova Scotia.

Grimsby.

The value of the North Sea fishery soon became established, and nothing in the history of our sea fisheries is more remarkable than the rapid but steady development of the system of trawling which has taken place from the Humber ports. The Hull trawlers were 40 in 1845, and most of these were arrivals from the Channel ports, as previously mentioned; but in 1863 they had increased to 270, and in 1877 there were 440 first-class fishing craft, with an aggregate of 26,310 tons, on the Hull register,—these, excepting a few shrimping boats just over 15 tons each, being all trawl-smacks. Another port on the Humber, Great Grimsby, situated nearer the entrance of the river, has made still greater progress. It had for some years been known in connection with the North Sea cod fishery; and the practice of bringing home the cod alive in welled vessels, and keeping them so till they were wanted for the market, led to the selection of Grimsby, rather than the more important town of Hull, as better suited, on account of the greater purity of the salt water, for preserving the cod in good condition in the floating store chests; and the extension of the Manchester, Sheffield, and Lincolnshire railway to the port provided the facilities for sending away the fish to the various inland markets. In 1858, when the railway was nearly completed, five of the Hull trawlers made Grimsby their head-quarters, and in the following year the line was opened to the town. The advantages of the port at once became evident, and the trawlers rapidly increased from 5 in 1858 to 70 in 1863; in 1872, only nine years later, the number was 248, and there were 82 cod smacks besides. In the return by the Board of Trade of the first-class fishing craft registered at Grimsby for 1877, the number of vessels, including trawlers, cod-smacks, and a few smaller craft engaged in procuring whelks for cod-bait, is officially stated as 505, with an aggregate of 29,924 tons, new measurement, which is more than one-third less than that known as builder's measurement. This gives an average of over 59 tons; but many of these vessels are 70 tons, and even more.

By the courtesy of Mr. Reed, the dock-master at Grimsby, we are enabled to give the following return of the quantity of fish sent away by rail from that town in each of the years from 1856 to 1877:—

Years.	Tons.	Years.	Tons.	Years.	Tons.
1856	1,514	1864	11,198	1871	30,857
1857	3,435	1865	13,368	1872	31,193
1858	4,344	1866	15,692	1873	34,876
1859	4,742	1867	19,416	1874	35,134
1860	4,842	1868	21,621	1875	34.881
1861	5,371	1869	24,140	1876	40,185
1862	8,521	1870	26,324	1877	44,376
1863	9,408				

The only break in this increasing series is in 1875, and is readily explained by the fact the herring fishery in that year was a very bad one, and that instead of about 4000 tons of herrings being then landed from Lowestoft and other boats at Grimsby, as had been the case for some few years previously, the quantity was very much smaller. Great, however, as has been the increase of fish sent away by rail from Grimsby, especially during the last two years, the returns above given do not represent all the fish landed at the fish-wharf; for a new trade to the Continent has lately sprung up, and fresh fish is exported direct to the following places, the returns being given for the two years in which this trade has been carried on:—

	Year.	Tons.	Year.	Tons.
Hamburg	1876	21	1877	111
Rotterdam................	"	1639	"	2683
Antwerp..................	"	735	"	911

It must be remembered that this great increase of the Grimsby trawl fishery has not been at the expense of Hull and other trawling stations, for, except at Plymouth, where, owing to local causes, the number of trawlers has remained about the same for several years, the others have also more or less largely added to their fleets. Grimsby is indeed comparatively new as a fishing station, but it is fast outgrowing in this particular trade the conveniences which, at the time they were provided, were thought ample for anything that would be required. A special dock of 12 acres in extent was constructed for the use of the fishing vessels; another of 11 acres has lately been finished, as well as a graving dock capable of holding ten smacks at a time. The fish are all landed on a covered pontoon 828 feet long and 48 feet wide; but so crowded has this landing wharf become, that an addition to it is likely to be made. Ice companies have also been established, with steamers of their own constantly bringing ice from Norway for the use of the fisheries. This is largely employed in packing the fish for transit by rail inland; but ice now also forms part of the regular fit-out of the trawlers, more particularly from September to May, when, there generally being plenty of wind, each vessel brings back its own catch of fish. An air-tight compartment is fitted in the hold of the vessel, called the "ice-box," in which from two to four tons of Norwegian ice are placed when she starts on her trip, or "voyage," as it is usually called. As the fish are caught they are stowed away below in bulk, with broken ice between the layers, and this is continued till a good quantity of fish has been collected. Then the vessel returns to port, after an absence of perhaps ten or fourteen days. The fish are taken out loose and put up to auction, the buyers finding the packages; in these the fish are packed with a sprinkling of crushed ice again between the layers, and an extra quantity at the top, which is covered with straw and tied down. From May to September, however, when light winds prevail, a different system is adopted, and the vessels fish in fleets of from twenty to fifty together. Their fish are collected every day by carriers, either steamers or fast-sailing cutters, which receive what each vessel has to send in, and with it a consignment note, or "pot-list," to the wholesale dealer, who has to sell it as soon as it reaches the market. All the fish are packed in ice as before, and are repacked in ice when sent away to the fishmonger, who keeps them under the same cooling influence till almost the moment of sale to the consumer; so that from first to last the value of ice in the trawl fishery is almost incalculable. Without this material the supply of trawl fish in a wholesome condition for food would not be a tenth of what it is now, the price would be infinitely greater, and the various trades benefiting by the trawling system would not be in such a thriving condition as is now the case. The public of course do not get their fish so fresh from the sea as formerly, and there is sometimes a want of flavor about it which is undoubtedly due to long icing; but if the fish be cooked as soon as taken from the ice, it is still wholesome and generally palatable food.

Besides the trawling stations we have more particularly mentioned, Great Yarmouth is of some importance, as, in addition to a considerable fleet of trawlers belonging to the place, many of the Barking smacks also fish from that port; but after what has been already said, there is nothing special to add regarding the trawling from Yarmouth, Lowestoft, Barking, Ramsgate, and some smaller stations.

Steam-trawling.

Steam-trawling.—An endeavor is now being made on a tolerably large scale to utilize steam in deep-sea trawling. The experiment is not altogether new, it having been tried on the Devonshire coast a few years ago, but without success; for, although steam answered perfectly well in towing the trawl, and saved an immense deal of labor in hauling up the net, and time in going to and returning from the fishing ground, it was found that the expenses were too heavy. About five years ago a steam cutter fish-carrying company was started at Yarmouth, with the intention of using the vessels for either trawling or taking the fish to market; but it appears to have been soon found that it did not pay to use the steam for trawling, and that the vessels would be more profitably employed in the carrying trade. The steam-trawling now being worked is from Shields; and the fact is worthy of note, for it was along this particular part of the east coast—from Sunderland northwards—that the complaints against trawling were so loud in 1863, that the royal commission of that year was appointed to inquire into the working of the trawl system, and they commenced their inquiry at Cullercoats, only three miles north of the present headquarters of steam-trawling. In 1877 it appears that trawling was tried with one or two steam-tugs, which, owing to the badness of the shipping trade, had very little to do; and it was found to be so successful that others fitted out for the same work, until about forty were engaged steadily in this fishery whenever there was nothing to keep them at home. The latest information is that other more suitable vessels are about to begin, and that by way of further experiment fast steamers are to be employed to collect the fish from the trawlers, which will take it to London, it is calculated, in about twenty hours. The best ground fished by these steam-trawlers is said to be north of Newbiggen, and at some little distance from the land. Very fine soles are reported to be taken there, and no doubt the character that part of the coast formerly had for turbot has not been entirely lost. The chief grievance of the Newbiggen fishermen in connection with this trawling is that their long lines are interfered with; but as they are in the habit of setting their lines, and then leaving them all night to take care of themselves, they can have no just or legal cause of complaint against fishermen who are working another method of fishing in the same neighborhood, and who have no means of finding out where the lines are after it has become dark. It is well-established law that no one can be held responsible for the loss of fishing gear in the open sea if the owners leave it unguarded.

Trawling grounds.

With regard to trawling grounds, those hitherto worked in the North Sea are principally on the Norfolk and Lincolnshire coasts for the home fishing, whilst the off grounds are about the southern part of the Dogger, and towards the Dutch coast.[1] Some localities are famous for haddocks, others for plaice, while soles are abundant on particular grounds. But there are seasons for each locality when the fish frequenting them become more numerous there. There is good trawling also to be had off Hastings, on the Diamond grounds, as well as on the Varne and the Ridge in mid-channel, and from the North Foreland far into the North Sea. On the western side of England, the Liverpool and Fleetwood trawlers work according to the season between the Isle of Man and the English coast, sometimes going into Carnarvon and Cardigan bays; and the Tenby ground is fished by smacks belonging to Tenby, and by several from Brixham during the summer months.

Number of trawlers.

The number of sea-going trawlers now working on the English coasts cannot be less than between 1700 and 1800, and of these upwards of 1300 regularly fish in the North Sea. Taking a low average of five hands to each vessel, we have nearly 9000 men and boys engaged in this fishery, and trained to a regular sailor's life.

Drift fisheries.

Drift Fisheries.—The next in importance to trawling among the English fisheries is that carried on with drift-nets for mackerel, herrings, and pilchards. It is undoubtedly the most common method of net-fishing on the coasts of the British Islands, but nowhere is it so general as in Scotland. There are, however, some considerable drift-fisheries on the eastern and southern coasts of England, and the important mackerel fishery is mainly at the western end of the Channel. The value of that mode of fishing, technically known as "drifting or driving," will be understood when it is remembered that it is the only method by which such fishes as herrings, mackerel, and pilchards, which generally swim at or near the surface, can be readily caught in the open sea, at any distance from the land, and in any depth of water, so long as there is sufficient for the floating of the nets in the proper position. The term "drift-net" is derived from the manner in which the nets are worked. They are neither fixed nor towed within any precise limits of water, but are cast out or "shot" at any distance from the land where there are signs of fish, and are allowed to drift in whichever direction the tide may happen to take them, until it is thought desirable to haul them in. The essential principle of the working of the drift-net is that it forms a long wall or barrier of netting hanging for a few fathoms perpendicularly in the water, but extending for a great length horizontally, and that the fish, meeting these nets and trying to pass them, become meshed; they force their heads and gill-covers through the meshes, but can go no farther; and as the gill-covers catch in the sides of the mesh, the fish are unable to withdraw and escape. Whether it be mackerel, herring, or pilchard, the manner in which the net works is the same; the variations which exist relate only to the difference in habits and size of the fish sought after.

Yarmouth herring fishery.

We will first speak of the Yarmouth herring fishery, one of the most important English drift fisheries, and the one of which we have the oldest records. The thriving town of Great Yarmouth in Norfolk is said to have been the resort of fishermen during the herring season as early as the 6th century, and there is no reason for believing that the fishery with which its name has been so long associated was ever carried on by any other method than drift-nets, as at the present day. An immense deal of information about the early records of the herring fishing at Yarmouth and other places has been compiled and published by Mitchell in his book on *The Herring*,[1] and to him we must refer our readers for numerous historical details on the subject; but we may mention that, according to authorities quoted by him, Yarmouth was erected into a burgh by Henry I. in 1108, the annual payment for this privilege being "ten milliers of herrings." The fishery was then evidently recognized as being well established, and herrings as the special trade of the town. A quaintly written account also of the origin of Yarmouth, as given by Manship (who wrote in 1619), is quoted in the following note by Swinden[2] in his history of the town:—

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[1] The great increase of large trawlers within the last few years has naturally led to a more extended field of work, and many of them now go much further to sea than formerly.

> "And now by pregnant probabilities, it is my opinion very clear, that from the landing of Cerdick (one of the Saxon adventurers) in anno 495, now 1124 years past, this sand, by the defluxion of tides, did by little and little lift its head above the waters; and so in short time after, sundry fishermen, as well of this kingdom, viz.: of the Five Ports (being then the principal fishermen of England), as also of France, Flanders, and the Low Countries, yearly about the feast of St. Michael the Archangel, resorted thither, where they continued in tents, made for the purpose, by the space of forty days, about the killing, trimming, salting, and selling of herrings, to all that thither came for that purpose; whereunto did resort the merchants of London, Norwich, and other places to buy herrings during the season, and then departed; as those fishermen who kill fish at Wardhouse use to do at this present. So in short time after, as that sand became firm land, and that thereby traffic began more and more to be increased, men finding the same to be a commodious place to dwell and inhabit in, did for that purpose gather themselves together, to have a continual residence therein, and began to build houses, of which came streets, and of those streets this flourishing township."

Without placing entire faith in Manship's conclusions, however, there is sufficient evidence of the antiquity of the Yarmouth herring fishery; and as it keeps up its repute at the present day, and has indeed considerably increased in recent years, some details of its working may be acceptable. The nets used in the drift-fishing were formerly all made of hemp or flax, but for some years past cotton has almost entirely superseded these materials. Cotton nets are manufactured at Bridport, Manchester, Musselburgh, and other places, and are about 30 yards long and 9 or 10 yards deep. One of the long edges of the net, called the "back," is fastened to a rope corked at regular intervals, whose purpose is to keep that part of the net uppermost. The number of such nets used by each vessel depends chiefly on her size, and ranges from 80 to 130, or even more. They are fastened together end to end, and thus united form what is called a "train, fleet, or drift of nets," often extending to a length of more than a mile and a quarter. The size of the mesh was at one time regulated by law, and the smallest dimensions allowed in herring nets were one inch "from knot to knot along the line," or, to speak more concisely, one inch square. Under the present fishery regulations, however, it is wisely left to the fishermen to choose a mesh of such a size as will be most effective in catching the fish, and their practical good sense does not often lead them astray in this matter. With herrings of average size the inch mesh is found to do the most profitable work. An exception to this freedom from restriction to any particular sized mesh exists, however, on one part of the west coast of Scotland, and to that we shall direct attention when we speak of the Scotch fisheries. Twine nets are coarser than those made of cotton, and the material not being so flexible, machinery cannot be satisfactorily used in their manufacture; they are therefore netted by hand, and are made in narrower pieces called "deepings," which are laced together one below the other to make up the required depth. The labor of hauling in these nets is of course more severe than with cotton, on account of their greater weight and faculty of absorbing the water; and the comparative stiffness of the mesh is not so favorable to the capture of the fish when they strike the net. On the other hand, it was objected to the cotton nets that the thread was so fine as to cut into the fish which were meshed, and to tear off their heads as the nets were hauled in. Whatever force there may be in this objection, the advantages in time and labor saved both in making and working cotton nets have practically decided in their favor, and cotton is now almost universally employed in all our drift-fisheries. The object of the cork-rope is, as we have said, to keep that edge of the net uppermost, but in the ordinary net the corks are only sufficient for that purpose, and will not prevent its sinking. This is provided against by the use of buoys, or "bowls," as they are called, one being attached by a rope to each net, and by lengthening or shortening this rope the net can be kept at any distance below the surface that may be considered best for catching the fish. It is always a matter of uncertainty at what depth the fish may be found, and a good deal of judgment is needed in sinking the nets, if there are no signs of the fish being near the surface. It is found convenient to color these bowls so as to mark the divisions of the fleet of nets. The first net, or the one nearest the fishing boat, is marked by a small white bowl, called the "puppy," and at the end of the next four nets is a "dan," or buoy with a pole carrying a small flag. The rest of the nets are marked in four divisions; at the first quarter from the pole is a bowl painted one quarter red and three quarters white; the next is half red and half white; and at the beginning of the last division the bowl is three quarters red and one quarter white. All the rest of the bowls from the beginning to the end of the train of nets are entirely black. The only part of the gear in connection with the long string of nets is the warp, a stout rope to which each net is fastened by two smaller ropes called "seizings," and long enough to allow the warp to hang down near the foot of the nets. This warp has a two-fold purpose: it prevents the loss of the nets if by any chance a vessel should pass through and cut them when near the surface, an accident not unlikely to happen, as the nets are only used at night and extend a considerable distance, often in the course of trading vessels going up and down the coast; and it is by means of the warp the nets are hauled in, the strain being thus brought evenly, by means of the seizings, on each separate net. The Yarmouth drift boats are the largest used for this kind of fishing on any part of our coasts. They are fine decked vessels of about 36 tons, the largest being upwards of 52 feet on the keel, with about 17 feet beam and 7 feet depth of hold. The universal rig has long been that of a lugger, with two masts only, and they carry a jib, a large dipping fore-lug, and a mizen with a topsail. The mizen-mast is always kept standing, but the fore-mast is made to lower backwards when fishing is going on, so as to enable the vessel to ride easier, as at that time she is head to wind and without any sail that can steady her. The mast is not lowered on to the deck, however, but, as is the practice with all large drift-boats, the head is supported on a wooden crutch 10 or 12 feet high, in the Yarmouth vessels called a "mitch-board." In this manner the mast lies very snug, and does not interfere with the room on deck. The interior of the vessel is fitted up with separate spaces for the nets, warp, fish, and salt, of which last a quantity is always taken to sprinkle the fish with before they are stowed away. These boats carry as many as ten or twelve men, as the labor of hauling in the nets is considerable; but more than half the crew are landsmen who are mainly employed at the capstan by which the warp and nets are got in. Strength, and not nautical knowledge, is required for this work; and all the important part of the fishing—the deciding where to work and at what depth to place the nets—is the business of the experienced fishermen.

Drift-net fishing is with rare exceptions only carried on at night. The time for commencing is just before sunset, and the nets are then got into the water by the time it is dark. When the vessel has arrived at what—from certain indications, such as numerous seabirds or possibly fish playing at the surface, or even without any special signs to guide the fishermen—may be thought a likely place for fish, for there is a great deal of speculation in the matter, the vessel is sailed slowly before the wind, and if possible across the tide; then the net is shot or thrown out over the vessel's quarter, the men being distributed at regular stations, some hauling up the net from below, others throwing it over and taking care that it falls so that the foot is clear of the corked back; others, again, looking after the warp which has to be paid out at the same time, and seeing that the seizings are made fast to it in their proper places. When it is all overboard, and about 15 or 20 fathoms of extra warp, called the "swing-rope," given out, the vessel is brought round head to wind by the warp being carried to the bow; the sails are then taken in, the masts lowered, a small mizen set to keep the vessel with her head to the wind, and the regulation lights are hoisted to show that she is fishing. A few of the hands remain on deck to keep a look out, and the vessel and nets are left to drift wherever the wind and tide may take them. It is very rarely that there is an absolute calm at sea; and if there is the faintest breath of air stirring, the fishing boat will of course feel it more than the buoys supporting the nets; she will consequently drift faster, and being at the lee end of the train, will have a constant pull upon them, and so keep them extended almost in a straight line, so that every portion of the nets hangs clear and free from folds. If there is a great deal of wind more swing-rope is allowed, so that the nets may not be dragged through the water or any undue strain be thrown on the warp, as the more warp there is out the greater spring there is in it, and the less danger of its breaking. The first net in the train is called the "look-on" net, and frequently after an hour or so, that one is hauled in to see if any fish have been taken, and if so, in what part of the net. If it has been allowed to sink too low, that will be shown by the fish being only in the upper part of the net, or *vice versâ*. Such an examination of one of the nets (called in Scotland by the name of "preeing") also sometimes discloses the fact that dog-fish are unpleasantly abundant, and this makes it desirable to haul in the nets very soon, as these pests of the fishermen do a great deal of mischief to both the fish and the nets if they are allowed to remain long in the water. The operation of hauling in the nets is carried on in the same systematic manner as in the case of shooting them. The laborious part of the work is now performed by the "capstan-men," whose duty it is to heave in the warp, the regular fishermen looking after the net as it comes on board, and shaking out the fish, which is at once sprinkled with salt and stowed away in the fish room.

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[1] *The Herring; its Natural History and National Importance* (1864).

[2] *History and Antiquities of Great Yarmouth*, p. 5 (1772).

After a day or two, depending on the success or failure of the fishing, the vessel returns to port; and the general practice since the opening of the extensive covered fish market by the side of the Yarmouth haven is for the luggers to go into the river and deliver their cargoes direct into the market. It is at times, however, a difficult matter to enter the haven, and then the old practice of landing the fish on the beach in front of the town is resorted to. The landing is effected by means of large "ferry-boats," which go off loaded with baskets of a peculiar shape, called "swills," each one capable of holding 500 herrings, and put them on board the lugger which is anchored at a short distance from the shore. The fish are then counted rapidly into the baskets, which are placed, when full, in the ferry-boat, and as soon as she is loaded she returns and is laid broadside on to the beach. A set of strong, active fellows, known as "beachmen," at once go to work, and two men taking each basket between them in their arms, soon carry up the fish to the carts waiting to take them either to the market or direct to the curing houses. The situation of the market by the side of the haven is very convenient; and, if required, more room can be easily provided by adding some of the vacant land immediately adjoining it, and with the same river frontage. The market was completed only in 1867, and although the Yarmouth fishery has been carried on continuously for many centuries, it is only since the opening of the new market that an accurate account has been kept of the quantity of herrings landed there.

The following statement shows the number of lasts of fish received at the market during each of the ten years 1868–77, and as a "last" of herrings contains 13,200 fish, some idea will be gained of the produce of the Yarmouth fishery, without taking into consideration what is landed elsewhere by Yarmouth boats:

Years.	Lasts.	Years.	Lasts.
1868	15,098	1873	18,796
1869	13,608	1874	17,724
1870	19,420	1875	11,820
1871	19,008	1876	12,824
1872	14,450	1877	18,900

The following is the mode of counting herrings on almost all parts of the east coast of England:

4 herrings = 1 warp.
33 warps = 1 hundred = 132 fish.
10 hundreds = 1 thousand = 1,320 "
10 thousands = 1 last = 13,200 "

Only 30 warps or 120 fish, however, go to a "hundred" of mackerel.

It will be observed that considerable fluctuations have taken place in the produce of the Yarmouth fishery during the last ten years; and there is no doubt that they have been almost entirely caused by variations of weather during the herring season.

Bloaters and red herrings.

A few words must be said here about the manufacture of bloaters and red herrings, which has made Yarmouth famous all over the world. The same mode of curing herrings is now adopted in many other parts of England and in Scotland, but the time spent on the operation is not in all cases the same.

As soon as the herrings are brought to the curing houses at Yarmouth, the fish are all washed to get rid of the salt they were sprinkled with on board the fishing boats, and then, without being gutted, or any other preparation, they are again put into salt, which is generally brought from Liverpool. Their subsequent treatment depends on whether they are to be made into red herrings or bloaters. The latter—Yarmouth bloaters, *par excellence*—are generally selected fish, full-roed and of the best quality. The finest are made in October and part of November, when the home fishery is going on, and they should be cured as soon as possible after they are taken out of the water. Strictly speaking, a bloater is nothing more than a herring that has been only slightly cured; it is kept in salt from twelve to eighteen hours, and then smoked for about twenty-four hours. But as any herring can be made into what may be called a bloater, and there being always a demand for them, their manufacture is carried on throughout the season with the best fish that can be obtained; and we need hardly say that bloaters are to be had all over the country, and cured in various places, which come far short in excellence of the selected Yarmouth fish. A properly cured bloater is ready for the market at once, and the sooner it appears on the breakfast table the better it is likely to taste. In the last few years some bloaters have been prepared at Yarmouth with even less curing than that we have spoken of, but they will not bear keeping very long. It is the practice at Yarmouth to keep the fish in salt for fourteen days if they are to be made into "red, well-cured, or high-dried herrings;" they are then washed and hung in wood-smoke for another fortnight. The curing is mainly done by women, and after the fish have been taken out of the salt and washed, they are "rived" or strung in "spits," or thin sticks, about 4½ feet long, which are thrust under one gill-cover and out at the mouth. Twenty-five fish are put on each stick. The spits are then taken to the smoke-room,—a lofty chamber, perhaps about 16 feet square, having a series of wooden frames reaching from floor to roof, with small transverse beams, called "loves," beginning at a distance of six or seven feet from the ground, and running, one above the other, from one side of the room to the other. The frames are four feet apart, and the spits are placed in rows between them, the ends of the spits resting on opposite loves. The roof is made of tiles, uncemented, so as to allow a good draught through the room, which when filled contains three lasts of fish. About sixteen fires are made on the stone floor of this room, the fuel generally being oak billets, which give a high color to the fish. Ash timber, producing a different color, is used in some cases, to suit the fancies of particular foreign markets. When the room has been thus filled with spits of fish, the fires are lighted and kept burning for two days; they are then let out, and the fish allowed to drip for a day; the fires are again kept alight for two days, and the process of alternately drying and dripping is continued for a fortnight, when the herrings are considered thoroughly cured, or high-dried, and are fit for packing. For the export trade they are packed in barrels, each of which should hold 650 good-sized fish, or a larger number of smaller ones. The manufacturer's name and the number of fish are marked on each barrel. The export trade is to Italy, the Greek islands, and the Levant. The time employed in curing these herrings is longer than is given in Scotland, but in some cases only half the usual time is allowed, and such fish are sent by steamer to the Mediterranean, where they are soon disposed of; but it is not considered safe generally to consign any but "well-cured" herrings to the foreign markets, especially in warm climates. For the home market both bloaters and "reds" are packed as a rule in flat boxes.

The drift fishery for herrings is carried on more or less along the whole east coast of England, throughout the English Channel, and to a small extent on the Welsh and western side of England. The seasons for this fishery differ, however, on different parts of the coast. It commences on the Northumberland coast in the latter part of July, becoming later as we go southward; at Yarmouth and Lowestoft the home fishery is in October and November; but a spring fishing has been made for some years past at Lowestoft, beginning at some distance from the land, and gradually coming nearer as the season advances. It is a fishery that has given rise to much complaint on account of the generally small size of the fish then caught. In the Channel herring-fishing goes on during November and December, and at the extreme west in the early part of the year. It is not a very important fishery there, however, and the attention of the fishermen is soon entirely given to the more lucrative fishing for mackerel, which may be said to have its headquarters at the mouth of the Channel, although the fish gradually advance eastward as the summer goes on.

Mackerel drift fishery.

The mackerel drift fishery is worked practically in the same manner as that for herrings, but a larger mesh is of course required, and about an inch and a half square has been found most suitable. That, however, is not the only difference between mackerel and herring nets. It is the special habit of mackerel to keep near the top of the water, and the nets are consequently so well corked as to float at the surface. It is also unnecessary to have the same depth of netting as when herring fishing, and what is saved in this direction is added to the length. A full train of mackerel nets as used by the large Yarmouth drift-boats is as much as 2½ miles long, or double that of a herring fleet. Twine was long used in their manufacture, but cotton has taken its place generally whenever new nets were required. Mackerel first appear in deep water south and south-west of the British Islands, and are sometimes caught as early as January many miles west of Scilly, but the general Cornish fishery does not usually begin till towards the end of February, and it extends into June. May, June, and July are the months in which the mackerel drift fishery is carried on farther up the Channel, and at the later part of that season in the southern portion of the North Sea. The important fishery for mackerel is, however, on the Cornish coast, and thither resort fishing-boats from Yarmouth, Lowestoft, and the various Channel ports, and, in company with the famous Mounts Bay luggers, devote themselves to the ingathering of this great harvest of the sea. Many thousands of tons of mackerel are landed at the western ports during the season, particularly at Plymouth and Penzance, and are sent away by rail to the London and other markets.

Pilchard drift fishery.

The pilchard drift fishery is worked in the same manner as that for herrings, but rather a smaller mesh is used, and herring nets which have shrunk too much for their original purpose are often usefully employed for the capture of pilchards. This fishery begins in July and continues till September. It is mostly worked on the coast of Cornwall, but during the last few years a great many of these fish have been taken along almost every part of the south coast of Devon. Pilchards may be regarded in England as essentially Cornish fish; there is very little sale for them out of their proper county, but there they are looked upon almost as one of the necessaries of life, and every household likes to have a store of salted pilchards for winter use. These are all the produce of the drift nets, the fish taken by the seans being cured for export to the Mediterranean. A new industry in connnection with the pilchard fishery has been recently established at Newlyn in Mounts Bay, and at Mevagissey, further to the eastward. This is the manufacture of "sardines," in precisely the same manner as has long been carried out on the French coast. The so-called "sardines," caught so largely in the Bay of Biscay, being nothing but young pilchards, there seemed no reason why the Cornish fish, if treated in the same way as the French, should not turn out as good. Curing-establishments were therefore set up at the two places named, and measures having been taken to insure a thorough knowledge of the French mode of curing, "Cornish sardines," or "pilchards in oil," were prepared, and with so much success that orders for them are now received for more than the present limited means of manufacture can supply.

Sardines.

Sean Fisheries.

Sean Fisheries.—Sean or seine nets are used on the English coasts chiefly for the capture of mackerel and pilchards, but sprats and various other fish are occasionally taken by them. The particular fishery with which this net is most commonly associated is that for pilchards at St. Ives, on the north coast of Cornwall, where seans are kept in readiness for working on a very large scale. For a long course of years St. Ives Bay has been more or less visited by shoals of pilchards, generally during the months of October and November. These fish are found in abundance off the south-west of Ireland rather earlier in the year, and it appears as if the shoals were returning towards the Bay of Biscay, when they arrive on the north coast of Cornwall in October. In their course southwards some of them enter St. Ives Bay and sweep around it, and if, in doing so, they come within a certain range of part of the shore, the seans are brought into play, and large captures of fish may be made. The seaning ground is on the western side of the bay, and extends southwards for nearly three miles from the bar. It is divided into six stations or "stems," by marks or boundaries on the land, in positions fixed by a local Act.[1] These stems have each a name, and no fishing boats besides those employed in the sean fishery are allowed to fish or anchor within a certain distance of the stems between an hour before sunrise and the same period after sunset from the 25th of July to the 25th of December; and any passing boats must keep near the shore. Under favorable circumstances the fishery is likely to be so valuable and of such general advantage to the town that the Act of Parliament regulating the proceedings is strictly carried out with the approval of all concerned. For this reason also no seans below a certain size are allowed to be used, so that the danger of disturbing a large body of fish, and perhaps frightening them into deep water without having secured a good haul, may be as much as possible avoided. The smallest sean of legal size at St. Ives is 160 fathoms along the cork-rope, with a depth of 8 fathoms at the middle or bunt and 6 fathoms at the ends or wings. Some of the seans are as much as 200 fathoms long, and the mesh in all is three-quarters of an inch square throughout the net. The object is not to mesh the fish as in a drift-net, but to inclose them. What we have described is the sean proper, but there is another of smaller size and different proportions which also takes part in the fishery. This is called a tuck-sean, and is only 70 to 80 fathoms long, but it is 8 fathoms at the wings and 10 fathoms in the middle or bunt. Besides these there are other nets called stop-nets, which are practically only additions which can be made to the principal sean, and which are so used when the sean is being worked. As there are about 250 seans at St. Ives, and only six stations in which they can be used, some arrangement is necessary to prevent confusion and interference, and this and other details are the subject of special regulations. The seans are all registered, and many of them belong to companies. Several boats are employed when a sean is to be shot. The largest, called the sean-boat, is about 32 feet on keel, with plenty of room for carrying the net; she has six men for rowing and two for shooting the sean. Two tow-boats about 24 feet long, and each carrying a stop-net, with a crew of six men, make up the working party; but besides these there is a small boat called the "volyer" or "lurker," from which the master seaner directs all the proceedings. The position of the shoals of fish is pointed out by men called "huers," who are selected from the sharpest and cleverest of the fishermen. There are generally two of them on the hill above each station, and when they see the shoals of fish, looking like the shadow of a cloud on the water, they signal with a large white canvas ball to the boats waiting below in the stations. These men remain on duty for three hours at a time, and receive £3 a month, and one hogshead out of every hundred hogsheads of fish landed. When the shoal has come within a convenient distance of one of the stations, the boats containing the sean and stop-sean, which have been previously joined together, commence shooting the nets at the same time, the larger net being thrown out in a direction parallel with the shore, while the stop-sean is shot in front of the shoal as the boat is rowed towards the land. The two boats ultimately turn towards each other, and gradually bring the ends of the nets together, thus cutting off and surrounding as many fish as they can. The second stop-net is joined to the first if there is a probability of its being wanted. The nets are then fastened together at the point of meeting, and the circle gradually contracted until all the fish are inclosed by the single large sean. The ends being securely joined and the stop-nets taken away, the circle of netting with the inclosed pilchards is slowly hauled towards the shore, into some quiet place as much as possible out of the run of the tide, till the weighted foot of the net touches the bottom, and there it is safely moored. The fish cannot now escape, and if the haul be a large one several days may elapse before they are all taken out. "Tucking" the fish is the next operation, and this is performed with the tuck-sean, which we described as being

St. Ives pilchard fishery.

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[1] 4 and 5 Vict. c. 57.

very deep in the middle. It is shot in the ordinary way with one boat, but inside the other sean, and as it is hauled in, the foot of the bunt is raised so as to bring the fish to the surface, whence they are dipped out in large baskets and put into attendant boats to be carried on shore. This is of course the exciting moment of the day, and all the town is astir, and taking part in the general rejoicing. Landing and carrying the fish to the curing houses is done by men termed "blowsers," who are paid in proportion to the catch of fish. The seanmen receive certain wages in money and a share of the fish, and every household does a little curing on its own account. The great bulk of the fish, however, goes into the houses of the large curers, who are generally the proprietors of the seans.

Export of Pilchards to Italian Ports from 1815 to 1877.

Year.	Hogsheads.	Year.	Hogsheads.	Year.	Hogsheads.
1815	15,000	1837	15,349	1859	3,289
1816	20,000	1838	7,580	1860	4,981
1817	24,000	1839	12,856	1861	11,078
1818	1,700	1840	23,372	1862	17,854
1819	2,900	1841	9,605	1863	25,677
1820	800	1842	20,735	1864	22,439
1821	2,000	1843	8,859	1865	9,929
1822	9,123	1844	13,976	1866	14,294
1823	24,109	1845	30,807	1867	15,832
1824	7,611	1846	34,137	1868	19,993
1825	12,651	1847	41,623	1869	15,143
1826	10,670	1848	7,591	1870	6,048
1827	5,238	1849	25,588	1871	45,683
1828	26,018	1850	25,530	1872	1,138[1]
1829	700	1851	26,736		18,406
1830	22,010	1852	15,233	1873	31,019
1831	26,648	1853	21,276	1874	819[1]
1832	31,930	1854	6,845		7,543
1833	10,037	1855	6,103	1875	7,337
1834	25,295	1856	18,833	1876	9,903
1835	23,833	1857	15,921	1877	9,477
1836	18,762	1858	18,479		

Pilchard curing.

Women are employed in the curing, which consists in packing the pilchards in alternate layers of coarse salt and fish on the stone floor of the curing house," until the "bulk," as it is called, has reached a height of five or six feet. The fish remain here a month, and the oil and brine draining from the mass are carried off by gutters in the floor to a cistern. When the fish have been sufficiently salted they are washed and packed with the heads outwards in hogsheads, and a "rose" of fish in the middle to keep the level. Gradual pressure is now applied on top of the fish, until the contents of the cask have been reduced one-third in bulk, and a large quantity of oil squeezed out; this escapes through the sides of the hogshead, the hoops not being at first very tightly driven. The cask is filled up three times before the pressing is finished, and then, after eight or nine days, the hogshead of fish should weigh four hundredweight gross. The average number of fish in each hogshead is 2500, and sometimes as many as 1000 hogsheads have been taken at one haul of the sean. The largest single catch recorded at St. Ives was 5500 hogsheads actually landed, and on that occasion great numbers of fish were lost besides. The fluctuation in the sean-pilchard fishery at St. Ives is very great from year to year; and it would appear remarkable, if the success of the fishery did not almost entirely depend on whether or not the shoals came into that part of the bay where alone the seans can be used. The St. Ives sean-fishery has been unsuccessful for the last four years, less than 10,000 hogsheads having been cured in each of those periods; but in the "Pilchard Circular" issued by Messrs. G. C. Fox & Co. of Falmouth, giving an account of the fishery season of 1877, it is said that "considerable bodies of fish visited the coast, but did not come into the stems where seines might have inclosed them."[2] The pilchards cured by the sean owners at St. Ives are all sent to the Italian markets;[3] and we have to thank Messrs. Fox for the preceding statistics of shipments since 1815. The fluctuations are almost entirely due to the variations in the great sean fisheries.

The special sean fisheries for mackerel are along the Chesil Beach near Portland, and on the Sussex coast, at and near Brighton; but they do not call for particular notice.

Stow-net fishery.

Sprats.

Stow-net Fishery.—This fishery appears to be entirely confined to the Solent, inside the Isle of Wight, the estuary of the Thames, and the Wash, between the Norfolk and Lincolnshire coasts. It is specially for the capture of sprats, although many young herrings are sometimes caught, and it is worked most extensively at the entrance of the Thames. The stow-net is a gigantic funnel-shaped bag having a nearly square mouth, 30 feet from the upper to the lower side, and 21 feet wide. It tapers for a length of about 90 feet to a diameter of 5 or 6 feet, and further diminishes to about half that size for another 90 feet to the end of the net. The whole net is therefore about 180 feet or 60 yards long. The upper and lower sides of the square mouth are kept extended by two wooden spars called "balks," and the lower one is weighted so as to open the mouth of the net in a perpendicular direction when it is at work. The size of the meshes varies from an inch and three-eighths near the mouth to half an inch towards the end, where, however, it is again slightly enlarged to allow for the greater pressure of the water at that part. The mode of working the net is very simple. Oyster smacks are commonly used in this fishery, although shrimping boats are also employed in it in the Thames. The smack takes up a position at the first of the tide where there are signs of fish, or in such parts of the estuary as are frequented by the sprats during that part of the season; she then anchors, and at the same moment the net is put overboard and so handled that it at once takes its proper position, which is under the vessel. It is kept there by a very simple arrangement. Four ropes leading, one from each end of the two balks, and therefore from the four corners of the mouth of the net, are united at some little distance in front, forming a double bridle, and a single mooring rope leads from this point of union to the vessel's anchor; so that the same anchor holds both the vessel and the net. The net is kept at any desired distance from the bottom by means of two ropes, one from each end of the upper balk to the corresponding side of the smack, where it is made fast. The open mouth of the net is thus kept suspended below the vessel, and the long mass of netting streams away astern with the tide. The strain of this immense bag-net by the force of the tide is often very great, but if the vessel drags her anchor, the net being made fast to the same mooring, both keep their relative positions. Here they remain for several hours till the tide slackens, the vessel's sails being all taken in, and only one hand being left on deck to keep watch. The way in which the fish are caught hardly requires explanation. The sprats, swimming in immense shoals, are carried by the tide into the open mouth of the net and then on to the small end, where they are collected in enormous numbers; from this there is no escape, as the crowd is constantly increasing, and they cannot stem the strong tide setting into the net. The first thing to be done in taking in the net is to close the mouth, and this is effected by means of a chain leading from the bow of the vessel through an iron loop in the middle of the upper balk down to the centre of the lower one, and by heaving in this chain the two balks are brought together and ultimately hoisted out of the water under the vessel's bowsprit. The net is then brought alongside and overhauled till the end is reached, and this is hoisted on board. The rope by which it is closed having been cast off, the sprats are then measured into the hold of the vessel by about three bushels at a time, until the net has been emptied. The quantity of sprats taken in this manner by many scores of fishing craft during the season, which lasts from November to February, is in some years simply enormous; the markets at Billingsgate and elsewhere are inundated with them, and at last they can only be disposed of at a nominal price for manure; and in this way many hundreds of tons are annually got rid of. The stow-boats do not generally take their fish on shore, but market boats come off to them and buy the fish out of the vessel's hold, and carry it away. The mode of working is the same in the Solent and the Wash as that we have described in the Thames and large quantities of sprats are landed by the Southampton boats.

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[1] Previous season's fish.

[2] It is difficult to suggest any satisfactory explanation of the fact, that, though large shoals of pilchards are every year observed passing the north coast of Cornwall, it is only in particular years that any great numbers of these fish enter St. Ives Bay and come within reach of the seaners. It might seem that the streams, containing drainage from mining works, which fall into the bay, would pollute the water, and tend to turn back the fish, but there is much less mining in the neighborhood now than formerly. The fishermen's idea that the state and direction of the tide, when a shoal of fish is near the entrance to the bay, affect the course of the shoals appears more plausible, for it must be remembered that, though the fishery season lasts several months, it is only at intervals that the nets are put into the water, and the tide may be unfavorable when the fish are heading towards the bay. It is quite clear that, as the sean fisheries of 1871 and 1873 were the most successful on record, there has been no gradual diminution of pilchards from over-fishing.

[3] A fishery for pilchards has recently been established along the coast of Galicia, and Spanish pilchards, cured in the same manner as the Cornish fish, are making their way in the Italian markets.

White-bait.

"Whitebait," or young herrings, as they should properly be called, are caught in the Thames by a net which is practically nothing else but a very small stow-net, and it is worked in essentially the same manner.

Line fisheries.

Line Fisheries.—Hand-lining and long-lining are worked more or less all round the British Islands, and various kinds of fish, such as cod, haddock, whiting, coalfish, pollack, bream, and conger are taken regularly on the English coast, some being more abundant in one part and some in another. The cod fishery in the North Sea, however, is the one specially deserving notice; it has been carried on in a systematic manner, and on rather a large scale for a great number of years. Welled smacks were in use at Harwich as early as 1712, and in them the cod were brought alive into port just as they are at the present day. The idea of keeping the fish alive appears to have been taken from the Dutch fishermen, and in the interval between 1712 and 1715 three vessels fitted for that purpose were built, but very inferior to those afterwards constructed.[1] In the year 1720 the number had increased to 12, and in 1735 to 30. Of that number Mr. Nathaniel Saunders, the progenitor of several generations of fish-factors and salesmen at Billingsgate, had six, and with four of these, which were very superior to the other two, he visited the coast of Scotland in the course of his fishing expeditions, and was at that time the chief medium for conveying goods to and from the north of Scotland. In 1766 a Mr. Orlibar, a fishing smack owner at Harwich, made the first attempt to fish for cod with long lines on the Dogger Bank; and although he was at first very unsuccessful, he persevered, and was so fortunate that in 1774 the number of smacks had increased to 62, of which 40 went regularly to the Dogger to fish with long lines. In 1788 there were 78 smacks, and in 1798 the number had increased to 96. About this time a few attempts were made at Gravesend, Greenwich, and Barking to construct smacks of a similar description, and the Harwich fishery gradually declined. Afterwards the three places on the Thames increased their connection with this fishery, and Barking especially became an important station, not only for cod-boats, but also for trawlers. Many cod vessels were likewise owned at Gravesend and Greenwich, and these two towns for many years had stores of live cod in chests floating in the river. Great changes have, however, taken place in recent times; the Thames water became so impure that the cod could not be kept alive in it for many days, and ultimately the storing of the fish there was altogether given up. The Harwich river was still used for that purpose, and is so now, although there are but few cod-boats belonging to the place; but the opening of the railways on the east coast gradually brought Grimsby into notice, and its position in relation to the fishing grounds was found so convenient that it gradually became, and there is every reason to believe it will remain, the headquarters of the North Sea cod fishery.

North Sea cod fishery.

The special feature in this fishery which distinguishes it from all other line fishing on the coast of the United Kingdom is the systematic use of welled vessels, in which the cod are kept alive until they are brought into port. These welled smacks are built for the purpose, the well not being a tank fitted into any suitable vessel, but a part of the original construction of the hull. Two strong water-tight bulkheads are built entirely across the vessel from keelson to deck, enclosing a large space just in the centre of the smack. This is the "well;" and a constant supply and circulation of the water from the sea is kept up within it through large auger holes bored in the bottom of the vessel, in that part of it between the bulkheads. The vessel is in fact built in three compartments, and the water has access to the central one through the holes made at the bottom of it. The entrance to the well is on deck through a hatchway, the four sides of which are carried down for about three feet to what is called the well-deck, above the level of the water-line, extending all round the hatchway to the bulkheads and sides of the vessel. The object of this lower deck is to keep the level of the water within certain limits when the vessel is rolling about or pressed down under sail. The cost of these welled smacks is about £300 more than that of the ordinary "dry-bottomed" vessels of the same size. The working expenses of a cod smack are also much heavier than in a trawler. Each of these line boats carries from nine to eleven hands, of whom as many as six or seven are apprentices of various ages; and the system of payment by shares, so general with the trawlers, is here only adopted in the case of the captain, who gets 9 per cent. of the proceeds of the voyage, the mate receiving 24s. per week, the men 22s., and the apprentices from £5 to £12 a year, according to their length of service. Provisions are found by the owner, entirely or nearly so. Both hand lines and long lines are used in this fishery, depending on season and locality. A complete set of long lines consists of about fifteen dozen, or 180 lines, 40 fathoms in length, each supporting 26 hooks on smaller short lines called "snoods," which are fastened to the main line a fathom and a half apart. A "string" of lines of this description is 7200 fathoms long, or nearly eight miles, and has 4680 hooks. Whelks or "buckies" are always used for bait where they can be procured in sufficient quantities, and in the regular long-line season each smack takes about 40 wash[2] of whelks with her for the voyage, and about half that quantity as the season draws to a close in March. The whelks are preserved alive in net bags, and are kept in the vessel's well till wanted, when the shells are broken and the tough fleshy animals extracted. Baiting the large number of hooks used gives plenty of employment to the large crew of the smack. The lines are shot at sunrise or earlier if the weather is fine and there is light enough to see what is being done. The smack is put under easy sail, and kept as much as possible with the wind free, so long as a course can be sailed across the tide, which is important, as then, as the line is paid out, the snoods drift clear of it. The lines are neatly coiled, and with the baited hooks are laid in trays all ready for running, each tray containing from 12 to 16 pieces of line, and as the vessel sails slowly along, the whole length of line is gradually put overboard. A small anchor at every 40 fathoms keeps the line steady on the ground, and its position at the two ends and at every intermediate mile is marked by a conical buoy or "dan," with a staff passed through it and carrying a small flag. When after a few hours the tide has nearly come to an end, the smack, which meanwhile has been hove to in the neighborhood of the last buoy, gets the end of the line on board and works in short tacks along its course, the line being hauled in, and the fish taken off the hooks as she proceeds. When the wind is very light a boat is used for hauling in the line, and the fish are kept alive in the stern of the boat, which is partitioned off so as to form a water-tight division. In any case the strong and lively fish are transferred as soon as possible to the ship's well, and dead fish, or those which do not appear likely to live in the well, are stowed away in ice. The season for long-lining is during winter, and the fishery is carried on both on the Dogger Bank and on well-known ground off the coast of Norfolk. In April this fishery comes to an end, and a few of the smacks go away hand-lining to Iceland and the Faroe Islands, salting the fish they catch there, and usually landing it at Shetland. In July hand-line fishing for cod begins in the home waters, and is continued till October, the commencement of the long-line fishery of which we have just spoken. The July fishery is at a distance of from 10 to 30 miles from the coast, as the approach of the herrings to the land at that time causes a great gathering of cod in their neighborhood. The smack is hove to when hand-lining, and each man works with a single line furnished with from two to six hooks. On the return of the vessel to Grimsby after a few days, the fish are taken out of the well by means of long-handled landing nets, and are put into wooden chests which are kept floating in the fish-dock. These chests are 7 feet long, 4 feet wide, and 2 feet deep, and are constructed so that there is a free circulation of the water through them. The water in the dock at Grimsby being quiet, the chests are made with the ends square; but at Harwich, another storing place for live cod, the chests are moored in the tideway, and have the ends boat-shaped, so as to offer less resistance to the stream. There are about 400 of these chests in use at Grimsby during the height of the cod season, and as many as from 15,000 to 20,000 live cod in them at a time. There is a great advantage in thus storing these fish, as they can always be sent quite fresh to market, and only as many forwarded as there is a demand for. Killing the cod for market is a strange scene, and it goes on daily during the season. Each chest will hold from 40 to 100 cod according to their size, and when the fish are wanted, a chest is hauled alongside a hulk kept in the dock for the purpose, and hoisted up just clear of the water; the top is then opened, and a man steps into the chest and lifts the fish out, seizing them by the head and tail, and throwing them on the deck of the hulk. It is often difficult work to get hold of the struggling and slippery cod, but one after another they are taken out and handed over to the executioner on the deck of the hulk; he grasps the fish tightly behind the head with his left hand, holding it down on the deck, and giving a few heavy blows with a short bludgeon on the nose, kills it at once. The dead fish rapidly accumulate in a heap, whence they are taken on shore to be packed in bulk in the railway trucks waiting by the side of the market to receive them. The fish thus killed and packed reach Billingsgate early the next morning, and are known in the trade as "live cod;" they fetch the highest prices; and there is something in the manner in which they are killed which enables them to be properly crimped many hours after their death.

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[1] Our notice of the early history of the cod fishery as carried on from Harwich is taken from a statement prepared by Mr. Groom of Harwich, and given to the Royal Sea Fisheries Commissioners in 1864.

[2] A wash is a stamped measure capable of holding twenty-one quarts and a pint of water.

SCOTCH FISHERIES.

SCOTCH FISHERIES.—The important fisheries on the coast of Scotland are drift-fishing for herrings, and line-fishing for cod, haddock, ling, and some other kinds. Besides these there is in particular localities sean or "trawl" fishing for herrings, and for sprats or "garvies."

Herring fishery.

Herring Fishery.—We will first speak of this special fishery, which from its profitable character, extensive range, and the employment it gives to vast numbers of the coast population, both afloat and on shore, ranks as one of the most important fisheries of the United Kingdom, as it is also one of the great harvests of Scotland.

Herring season.

The herring season on the Scotch coast does not commence everywhere at exactly the same time, although the principal fishing is always during the summer months, the winter fishings being local and rather uncertain. The earliest herrings are taken on the west coast, and are generally first met with outside a line between the Butt of Lewis and Cape Wrath during April. In May the herrings come into the Minch and work their way southwards; but they sometimes enter the Minch at the south end of the islands, and in 1870 in particular, there was a large fishery near South Uist and Barra, but mostly on the Atlantic side, some miles south-west of Barra Head. It is rarely, however, that herrings are taken on the western side of the outer Hebrides, and the great fishery may be said to lie between those islands and the mainland. The fish remain in these waters in greater or less abundance till nearly the end of September, but May and June are the most productive months of the season, and during that period a great number of boats from the east coast go to the western side to take part in this early fishery. As July approaches the order of proceeding is reversed: the time is near for commencing the great fishery on the east coast, and one by one the boats which had come from that side return to their own waters, and many others from the western districts accompany them. The eastern fishery begins about the middle of July, and continues until about the end of September, commencing at the north and extending gradually southwards as the season advances. Many changes in the importance of particular districts as centres of this fishery have taken place in the course of years. For a long time Wick was the leading fishing and curing station on the east coast, sending out 1000 boats daily during the best of the season; but recently the fisheries from Peterhead and Fraserburgh have been unusually successful, and they have taken the principal position on the east coast for the extent of their curing operations.

Nets and boats used.

Drift-fishing is the method by which most of the Scotch herrings are taken, the use of seans or "trawls" being practically confined to a few localities on the west coast so far as regards the herrings, although they are employed on the eastern side for the capture of garvies. Cotton nets are now universally used, and the manner of working them is precisely the same as we have already described in our account of the Yarmouth fishery; but there has been a considerable increase in both the size and number of the nets worked by each boat. This has been due to several causes. The lightness of cotton nets compared with those of hemp formerly in use enables a larger quantity of netting to be easily handled by the same number of men, and thus more catching power is provided. Then it is desirable to make up a certain weight of nets in proportion to the size of the boats, that they may not drift too fast and drag the nets through the water; for all the strain that is needed on a fleet of nets is as much as will keep them extended in as near a straight line as may be. The fisheries have in late years been carried on far out at sea, and a remarkable change from open to decked fishing boats has taken place, a change that had for a long time been earnestly recommended to the fishermen for their own sakes, and to prevent the great loss of life which had so frequently occurred when the open boats were overtaken by bad weather. This change led to larger boats being built, capable of using an increased quantity of fishing gear. There are thus many reasons for the additional netting now generally employed, without resorting to the idea that it has become necessary owing to herrings having gradually diminished in the seas. We may here mention that the official returns of Scotch fishing boats have of late years shown a steady diminution in their number, but it will be found on examination that the falling off has been only in the second and third class boats, and that those of the first class have been increasing. In the last report issued by the Board of Fisheries, that for 1876, a decrease of 109 boats is recorded; but at the same time it is stated that there were 181 fishermen and boys more than in the previous year, and the estimated value of the boats, nets, and lines, had increased by as much as £35,719. The size of the fishing boats is limited unfortunately by the general absence of natural deep-water harbors where they would be most useful, so that no very great increase in their tonnage can be conveniently made; and although first-class boats are taking the place of those which were in the second, the change does not involve an addition of more than four or five tons in one of the larger craft. Fourteen tons was a common size for a large second-class boat, and as anything over 15 tons ranks in the first class, the new ones of 17 or 18 tons are all included under that head. There is little difference at first sight in the appearance above water of most Scotch fishing boats, but there are many distinctions below the water-line in accordance with local ideas. As a rule, excepting on parts of the west coast, the boats are sharp at both ends and have a great deal of beam, but they differ much in depth and in the extent of rise to the floor. The Buckie boats have long been remarkable for their peculiar build and rig, having a low and broad midship section with a flat or rather hollow floor; they are very fine at both ends, and have considerable rake of both stem and stern post. They are commonly known as "scaffy" boats. Another peculiarity in these boats was that they carried a mizen lugsail in addition to the large fore and main lugs which were the usual working sails of the general run of Scotch fishing craft. Fishermen as a class are most unwilling to make any change in their style of boats or methods of fishing; but when decked boats were fairly tried on the Scotch coast, their advantages could not fail to be acknowledged; and as it was found that profitable fishing[1] could be carried on with them in weather such as was dangerous for open boats, the change from undecked to decked fishing boats gradually gained favor, and is now very general. This alteration, however, involved an important change in the rig of the boats in the doing away with the main-lug, a sail which for many years had given a distinctive character to the Scotch fishing boats. In our notice of the Yarmouth luggers we mentioned that when the vessel was fishing, the foremast was lowered on to a crutch on deck, so that the vessel might ride easier and not roll about, as the weight of the standing mast would be likely to make her do. This is the practice with all drift-fishing boats; but in decked boats there is a difficulty in doing this with a second mast, and if it were done there would be so much more hamper upon or near the deck and in the way of the fishermen as to cause much inconvenience. The mainmast has therefore been done away with, and the necessary after-sail is provided by means of a mizen, which, being outside the stern, has plenty of power when wanted, and is out of the way of the fishermen. The fore-lug is made larger than it used to be, so that there is still plenty of canvas, and the general rig of the boats is now just what has been for a very long time adopted by the English fishermen as the most convenient for drift-fishing. Steam-tugs have been advantageously used in towing the fishing boats towards and from their fishing ground; but such a system could hardly be generally applied to the vast fleet of boats which collect in certain years at some of the stations.

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[1] As evidence of the advantage of using large-decked boats, the following extract from the fishery officer's report from Eyemouth is quoted by the Hon. B. F. Primrose, the energetic and obliging secretary to the Board of Fisheries, in his *Annual Report* for 1876:—"The crews who had large-decked boats, and perseveringly followed out the fishing were successful; while those crews about Berwick and Spittal who were not so well prepared did little good. Many of the Eyemouth and Coldingham boats made from £200 to £300 for the season, several from £400 to £500, and a few from £500 to £700 each. The Berwick and Spittal crews, on the other hand, who fished with open boats and inferior netting, made only from £60 to £120." Evidence to the same effect is given from Anstruther, and similar records have appeared in former reports.

Fluctuations in herring fishery.

The fluctuations in the herring fishing are very remarkable, but they are not more so on the coast of Scotland than on that of Norway and elsewhere. Indeed, Norway and Sweden afford instances unparalleled in Britain of the disappearance of herrings from particular districts, and their return in the most unexpected manner after a long course of years (see p. 234). On the coast of Scotland, the changes which take place in the fishery consist in an increase or decrease at particular districts rather than a total disappearance from any one of them. The most marked failure in recent years is in the Firth of Forth, where the summer fishing has now been given up, only a small winter fishing being carried on. At Wick, also, for a great number of years the most important station on the east coast, the herring fishing has been more or less diminishing, whilst at the same time Fraserburgh, only about 70 miles distant from it, has gradually assumed an unexampled importance. It is true that in 1876 there was an immense falling off in the quantity of fish landed at the latter port, but it was a bad year at almost every station on the east and west coasts, and the almost general decrease arose not from any apparent scarcity of fish, but from the boats being frequently kept in harbor by a continuance of very bad weather during the fishing season, or being unable from the same cause to work their nets when they reached their regular grounds. There is some reason for believing the alleged scarcity of herrings near the land is not so great as has been supposed. Successful fishing many miles out at sea has attracted large numbers of boats from the home waters, and the catches inshore have been consequently much diminished; still the general opinion appears to be well founded that the fish have not entered the firths and lochs in the last few years to the same extent as they used to do. That the fisheries, taken as a whole, have been gradually increasing is shown by the carefully prepared statistics of the Board of Fisheries; and it is desirable to point out that the great increase in the quantity of netting now used is to some considerable extent counterbalanced by the shorter time the nets are in the water; for the boats go long distances to sea, and they have to leave off fishing earlier in order to bring in their fish in good time to the curers. It may appear strange that after the lapse of centuries during which the herring fishery has been regularly carried on, so little knowledge should have been gained of the habits of this valuable fish; but it must be confessed that at the present moment we can say nothing positively about what brings the herring towards the land, why at one time they will "strike" the nets, and at another they will apparently not go near them—in short, what are the particular influences which regulate their movements. Of course, the old idea that these fish come into shoal water in order to deposit their spawn is the one still generally received, and we will not venture to say it is incorrect; but if it be true that the spawning fish come in for that purpose, that cannot be the inducement in the case of the "maties" or fish which show no development of the milt or roe. Yet both these herrings do precisely the same. Mackerel differ from herrings in spawning at the surface, and it has been abundantly proved that their ova float during the whole period of development; still we find that mackerel in full spawning condition, and half-grown fish also, are mixed up in the same shoals at the time when they approach the land. Thus we find the habits of surface-spawners and ground-spawners are alike in this respect, yet the common explanation of the visits of the spawning herring will not apply in the case of the mackerel, or even in that of the "matie." With respect to the causes which induce the herrings to keep near the surface, or to remain at some little depth, a step seems to have been taken in the right direction in the observations now being made of the possible relation of the temperature of the sea to the higher or lower movements of the fish. Good service was done by the late Marquis of Tweeddale when he provided a number of deep-sea thermometers for the use of the fishery officers and fishermen, whose observations are reported weekly to the Meteorological Society of Scotland, and come under the careful scrutiny of the secretary, Mr. Alexander Buchan. It is early yet to expect any definite results from this inquiry, as it has only been carried on for four or five years; but the observations hitherto made point to a high degree of temperature in the sea being unfavorable to fishing, and show that, when the sea is found to be colder in any one district than in that on either side of it, the herrings are more abundant and the fishery is more successful in the colder than in the warmer water. It is also stated that the influence of thunderstorms had been perceptible in each year; and that if a thunderstorm of some magnitude had extended over a large portion of the east of Scotland, good takes of fish might be made on that day, but on the following day few if any fish would be caught over that part of the coast, unless at the extreme verge of a deep part of the sea, as if the fish were retreating thither. Observations on the influence of winds and the temperature of the sea have also been made by the Dutch fishermen; and Herr von Freedon of Hamburg believes, from an analysis of these observations, that a temperature of from 53° to 57° F. is most favorable for the herring fishery, and that the chances of success diminish with higher or lower temperatures. Should these conclusions be confirmed, it is quite possible that the fishermen may be enabled, by a trial of the temperature of the sea at different depths, to determine how far their nets should be sunk to give them a fair hope of a successful fishing, instead of working, as they do now, very much on the chance system, often finding that they have been too high or too low for the principal part of the shoal.

Herring curing.

The important system of curing herrings in the wet state, or, as it is properly called, as "white herrings," is more completely worked on the east coast than on the west. The whole process of curing is carried on under the supervision of the Board of British White Herring Fishery, which was established by the Act, 48 Geo. III. c. 110 (1808), and, with some slight changes in its organization and additions to its duties, has continued its labors to the present time. Its particular duties are to inspect the curing, and to see that the proper regulations are duly carried out; to place the Government brand on the barrels when desired, according to the quality of the cure; to see that the regulations for registering the fishing boats are duly attended to; to maintain order on the fishing grounds; to lay out to the best advantage a special grant of money for improving or building fishery harbors; and to prepare accurate statistics of the fisheries. Many years ago curing according to this system was done at some of the English ports,—hence the word British in the title of the board; but for some little time past "white herrings" have practically only been prepared in Scotland, and the now ordinary name of "Fishery Board, Scotland," fairly expresses the geographical limits within which its duties are performed at the present day. The general out-door work of the board is performed by a body of men who are well known by the title of fishery officers; and it is essential that they should have been brought up as coopers, an important part of their duties being to see that barrels[1] of a proper size and make are used for the packing of the cured herrings, and that they are securely headed and driven before they are sent abroad. The various duties these officers have to perform, and the careful training they have had in them, have resulted in the board gradually obtaining a staff of men by whose intelligence and experience a vast store of information about everything connected with the working of the Scotch fisheries has been collected. Each man is placed in charge of a district of the coast, and the detailed reports they make to the secretary form the basis of the valuable and instructive reports of the Commissioners of the Fishery Board annually presented to Parliament.

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[1] When the fish are brought on shore from the fishing boats, the quantity is ascertained by a "cran" measure, which should hold 45 gallons of ungutted herrings; each cran of such fish is expected to furnish enough good cured and gutted herrings to fill a "barrel" having a capacity of 37½ gallons,—the difference between the two measures being usually accounted for by the broken fish unsuitable for curing, and the less space occupied by the gutted fish.

The operation of curing the herrings begins as soon as they are landed, and the busy scene which is presented at the large curing stations when this work is going on is well described in the article "Fisheries" in the last edition of the present work:—

"All along the inner harbor, and in almost every street and quay, of the town of Wick, as well as within many large inclosed yards and covered buildings, there are numerous square boxes as big as ordinary-sized rooms, the containing sides, however, being only two or three feet high. Into these huge troughs the herrings are carried from the boats as soon as possible after they arrive. There they are all tumbled in helter-skelter, in a long-continued stream of fish, until the boats are emptied or the troughs are filled. Then come troops of sturdy females of various ages and complexions, each armed with knife in hand, who range themselves around the fishery chambers: the process of gutting immediately commences, and is carried on with such ceaseless and untiring activity that the unaccustomed eye can scarcely follow the quickness of their manipulations. One woman will eviscerate about two dozen of herrings in a minute; and when nearly 2000 of them are working at that rate, with but brief intermission from early morning till the close of day, the amount of disembowelment may be more easily imagined than described. This important process is effected in the following manner. The practitioner takes a herring in her left hand, its back lying in her palm, and inserts the point of her knife into the near side of the neck, bearing well down upon the backbone, and making the weapon protrude a little through the other side. She then gives the knife a turn, and pulling it outwards and upwards, with an opposing pressure of the thumb, she draws forth in the first place the gills, stomach, and intestinal canal, and tosses them into an adjoining barrel. She then inserts the knife a second time, and by a peculiar twitch removes what is called the crown gut or cœcal appendages and liver. There are thus two actions performed, each of which seems to occupy about a second of time. This is the ordinary Scotch practice. The Dutch method is somewhat different. They leave in the crown gut, and so with them a single pull suffices to remove whatever is to be taken away. This latter method is partially followed in this country, as being best adapted for the Continental market, where it is believed that the crown gut has a powerful influence in improving the flavor of the fish, and where the appearance of the herring is held to be injured if it is removed. These fair gutters usually work together in little companies of two or three, so that while one is filling a measure with her gutted fish, another carries them off to be *roused*, as it is called, that is, cast into vats or barrels, then sprinkled with salt, then more herrings and more salt, and next a brawny arm plunged among them far above the elbow, thus mingling them together, and so on till the space is filled. They may lie a longer or shorter time in this state, according to the supply of labor at command, and the immediate necessities of gutting and rousing; but the next usual step in the routine is for a third hand to remove those herrings from the second vats or vessels, and re-salt and pack them carefully, every successive row crossing at right angles that which precedes it. Herrings intended for the foreign market are usually arranged with their backs downwards, while those for the Irish market are preferred when packed flat, or more upon their sides. Each row gets a fresh sprinkling of salt until the barrel is filled. The head of the cask is then laid loosely on, the contents being allowed to settle down, or *pine*, as it is called, for a time,—which they soon do so considerably as to admit of each cask receiving another row or two, with additional salt, before being closed by the cooper. The barrels should then be headed up, tightened in the hoops, laid upon their sides, and placed under cover, so as to be shaded from the sun's rays, which are injurious to the fish. They should also be rolled half over every second or third day, until they are bung-packed; which process, if the after intention is to receive the official brand of the Board of Fisheries, must not be sooner performed than after the lapse of ten free days from the date of capture." Sir Thomas Dick Lauder[1] thus describes the final operations:—"When the pickle has been sufficiently poured off, a handful of salt, if required, should be thrown around the inside of the barrels, and the herrings should be pressed close to the inside of the casks, and additional fish, of the same description and date of cure, should be packed in until the barrel is properly filled; after which it should be flagged, headed, blown, and tightened, and the curing marks scratched upon the sides. The barrel may then have its pickle poured in, and be finally bunged up."

Classes and brands.

The cured herrings are separated into four classes:—"Full," or fish having large milt or roe—in fact, those which are nearly or quite ready to spawn; "Maties,"[2] or fat fish, in which the milt or roe is quite undeveloped; "Spent," or shotten, those which have recently spawned, and consequently are in very poor condition, having neither the fat of the maties nor the roe of the full fish; and "Mixed," consisting of fish of all kinds, or unassorted. For these four classes the Board of Fisheries gives distinct brands, denoting the quality and description of fish in each barrel; but the crown full brand, given only to "full" fish properly cured, is the one in special request. It denotes the finest production of the system of the British white herring cure. Branding is quite optional on the part of the curer; but in any case this method of curing can only be carried on under inspection, and barrels of a particular size must be used for packing the fish in. It is one of the anomalies of the system, however, that although it is absolutely forbidden to use barrels of other than a certain specified size, there is not the slightest restriction as to the quality or condition of the fish to be packed in them, so long as the Government brand is not desired for them. Any refuse fish may be cured and packed, but the barrel must be of a certain size. The advantages or disadvantages of the branding system have been often discussed, and it has been frequently condemned as opposed to the general policy of making the sale of an article dependent on its merits alone; it has been contended that the Government is not justified in giving a certificate of the quality of cured herrings more than of any other manufactured article, and in no other case would such a guarantee be given. To this it is replied that there is a demand for "white herrings" in numerous and distant European markets; that without the Government brand a barrel of herrings would in some places rarely be sold unless the contents were first examined; and that the disturbance and exposure of the fish would lessen their value when they were ultimately unpacked at the end possibly of a distant journey. They may pass through many hands before they finally reach the consumer, and each person would be anxious to satisfy himself of their quality. There is no doubt that the brand facilitates the sale under such circumstances, but at the same time it cannot be disputed that thousands of barrels are sold on the Continent every year with no other guarantee than that of the curer's name. Up to the year 1859 no charge was made for branding; but since then a fee of fourpence per barrel has been paid, and the proceeds practically count against the expense of the board. It was believed in some quarters that the alleged value of the brand was really not so great as to make the curers willing to pay for it, and consequently the system might be quietly got rid of by the curers ceasing to make use of it. The result has been precisely the reverse; and the argument against the continuance of branding on the ground of the expenses in connection with it has been considerably weakened by the fact that the system is now to a large extent self-supporting.

The following table shows the amount of fees collected in the years 1859–77, in accordance with the Act 21 and 22 Vict. cap. 69 (1858):—

Year.	Fees Collected.	Year.	Fees Collected.	Year.	Fees Collected.
1859	£2644 12 0	1866	£4158 10 0	1873	£7254 11 6
1860	3865 4 6	1867	5290 7 0	1874	8625 19 6
1861	4422 9 0	1868	3491 0 10	1875	8729 16 6
1862	5578 10 8	1869	4075 7 6	1876	4216 6 6
1863	4614 13 6	1870	4989 13 10	1877	6629 18 4
1864	3623 4 0	1871	5777 4 6		
1865	3613 1 8	1872	7045 10 6		

West coast curing.

On the west coast of Scotland the herring fishery is also of great importance, and, as we have previously mentioned, it begins earlier than that on the eastern side. There is a good deal of curing in the Stornoway district, but the brand is in little favor. It is alleged that the western fish, especially those caught early in the season, are more delicate than those taken on the east coast, and will not bear the close packing requisite for ensuring the proper weight in each barrel if it is to receive the brand. The real explanation is doubtless that the curers are anxious to catch the market as soon as possible, and will not allow the number of days for the fish to be in pickle before sending them away that is necessary according to the branding regulations. These early cured fish are maties or fat herrings, and are chiefly sent to the Russian market. A very large quantity of the western fish caught later in the season is, however, sent to market in the fresh state; they are sprinkled with salt and loosely packed in barrels, and quickly taken by special steamers to Glasgow and to Liverpool. These fish are given under the head of "bulk" in the published returns by the Fishery Board, and, being slightly salted, are included among the "cured fish," although not with those which have been gutted and have gone through the regular preparation for export. On arrival at the home markets they may be readily sold as fresh herrings, after the sprinkling of salt has been washed off.

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[1] *Directions for taking and curing Herrings, and for the curing of Cod, Ling, Tusk, and Hake*, by Sir Thomas Dick Lauder, Bart., Edinburgh, 1846.

[2] "Maties" is a corruption of the Dutch *maatjes*, the term applied, to herrings in which the roe is small or undeveloped. Its signification, however, is doubtful, and the nearest approach we can find to the word is *maatje* (*klein maat*), a small measure which it seemed might possibly refer to the small size of the undeveloped milt or roe, as compared with the bulky proportions of those organs in the full fish. But our inquiries on the subject from authorities, both in England and the Netherlands, have failed to elicit any definite explanation. The Dutch separate their herrings into three classes, as we do, according to the condition of the reproductive organs, viz:—"Voll," full of roe; "Maatjes," with the roe undeveloped; and "Ylen," empty or shotten. *Maatjes* are generally fat fish, but herrings are in that condition only when the roe is very small. As the breeding season advances, the fat is gradually absorbed, and the fish become *voll;* and when the spawn, then fully matured, is deposited, the herrings are called *ylen*, or empty.

Close time for herrings.

It is on the western coast that the question of a close time for herrings has been so much discussed, and unfortunately in 1860 an Act (23 and 24 Vict. c. 92) was passed by which a close time was established there. The bill was brought in at the instance of some of the curers at Glasgow and other places, principally on the west coast. By this Act herring fishing was entirely prohibited from the 1st of January to the 31st of May on any part of the coast between Ardnamurchan Point and the Mull of Galloway on the south, and from the 1st of January to the 20th of May between Ardnamurchan and Cape Wrath on the north. Not a herring was allowed to be taken during the close season for the purpose of sale, or to be used as bait, or to keep the fishermen from starvation; and it appears that this cruel prohibition was to be enforced that the markets might not be supplied with fish which were not of the best quality, but yet were sufficiently good to command an easy sale, and therefore to lower the prices the curers would otherwise have obtained from the regular summer fishery. It was professed that the early fishing broke up the shoals before they entered the Minch, and therefore diminished the supply in June and July; and it was said that many of the fish caught between January and May were unwholesome and unfit for food. But an inquiry into all the circumstances of the case clearly showed that the promoters of the Act for establishing close time were the curers alone, who held meetings of their own body, and, without consulting the fishermen, pressed forward a measure which sacrificed every one's interest to their own. It was one of the most unhappy episodes in the history of the Scotch fisheries; but fortunately the effects of the close time were soon made known, and after a short experience it was found impossible to enforce a law which brought misery and starvation to the homes of a coast population, many of whom previously could only manage to obtain a bare subsistence by hard and unremitting toil. The law remained practically in abeyance for a time, and no prosecutions for infringing it were carried on pending the result of the report of the royal commission in 1862 on herring trawling. In 1864 this question of close time came also before the royal commission for inquiring into the condition of the sea fisheries generally; and such overwhelming evidence of the evil effects of the close time was brought before the commissioners that, in anticipation of their complete report, they did not hesitate to bring the subject before the Government, with the view to some relief being given before the question could be finally disposed of. This resulted in instructions being given not to enforce the law; and in the following session of parliament a bill was passed by which close time was entirely abolished north of Ardnamurchan Point. This included all the inner and outer Hebrides, where the restriction had been so severely felt. South of that part of the coast close time was continued as before, with the exception of January, which became free to the fishermen. By subsequent legislation (the Sea Fisheries Act, 1868) this close time has been done away with beyond the three-mile limit, so that at the present time herring fishing is entirely free everywhere around the British Islands except within three miles of that part of the coast of Scotland which lies between Ardnamurchan Point and the Mull of Galloway; and the difficulties of enforcing the law there are so great that the close time has now only a nominal existence. Another commission which has been recently engaged in inquiring into the state of the herring fisheries of Scotland has also reported against the utility of close time.

"Trawling" or seaning for herrings. Loch Fyne disputes.

The fisheries of the west coast of Scotland have unfortunately given rise to much bitter feeling among those who are interested in them, either as fishermen or curers, and nothing has caused so much social disturbance as the quarrels between the drift-fishermen and those who have been using the sean-net, or, as it is called in Scotland, the "trawl," for catching herrings. The localities in which these disputes have specially taken place are Loch Fyne and the Kyles of Bute, but more particularly in the former long famous waters. We have already described the general mode of working the sean, when speaking of the English fisheries, and we will only now repeat that this method of fishing consists in shooting a long sheet of netting in a semicircle, both ends of which are most commonly hauled on shore until the whole net with the inclosed fish is landed; but sometimes a boat is used as the fixed point at which the ends of the net are made to meet, and into which the net is hauled as before. In the former case the net is used as a ground-sean, in the latter as a circle-net. Both are equally objected to by the drift fishermen, who, until about the year 1838, had fished Loch Fyne according to the old established method. The trawl was then introduced, and on several occasions a gunboat has been required to keep order between the fishermen when both modes of fishing were being carried on. Loch Fyne, as we have said, was the special scene of these disputes, and one common complaint by the drift fishermen was that the trawls intercepted the fish at the entrance to the loch, and broke up the shoals, so that the herrings did not find their way to the upper water, where it was alleged there always used to be plenty of fish at the proper season. There were complaints also that fish of all sizes were caught by the trawl, those which were too small to be stopped by the drift nets and those too large to be meshed in them—the "mother fish," as some of the fishermen called them. Then it was said that the trawlers sometimes made such enormous hauls that only a portion of the catch could be saved, and, besides other sins laid to their charge, it was finally stated as the crowning offence—one that really explained the principal opposition to the trawlers—that they lowered the price of herrings to a considerable extent by the large supplies they could with little expenditure of time and trouble sometimes throw into the market, and so prevented the driftmen from obtaining the better prices they had commonly got from their smaller catches.

The result of these several complaints was that in 1851 an Act (14 and 15 Vict. c. 26) was passed to put an end to trawling for herrings on the coast of Scotland; but that not proving effective, more stringent measures were brought to bear on the fishermen in 1860 (23 and 24 Vict. c. 92) and 1861 (24 and 25 Vict. c. 72), and fishing with the trawl was completely suppressed. So strong a feeling existed, however, among a large body of the fishermen and others that the complaints against trawling were unjust, and the prohibition injurious to the interests of the public as well as to the fishermen immediately affected by it, that in 1862 a royal commission was appointed especially to inquire into the subject; and in 1864 the question was independently considered by two of the members of the general Sea Fisheries Commission, the third commissioner being purposely absent from the second inquiry, as he had taken part in the proceedings of the previous one. The conclusions arrived at by the two commissions, after hearing a great deal of evidence from both sets of fishermen, were decidedly adverse to the opponents of trawling, and were to the effect that the herring fishery in Loch Fyne had suffered no diminution by that method of working; on the contrary, it had really been progressive, when the periods of comparison were made sufficiently long to correct the annual fluctuations, which were always considerable in this as in all other herring fisheries. They say[1]:—"The selected years of bad fishing, brought as proofs that trawling was destroying the fishery, have, when examined, no application to the question, as an equal number of years of quite as bad fishing are found in every decennial period before the system of trawling had been discovered. . . . Trawling for herring has been an important means of cheapening fish to the consumer, by the large and sudden takes, and has thrown into the market an abundant supply of wholesome fresh fish at prices which enable the poor to enjoy them without having to come into competition with the curer. It is this circumstance which, in our opinion, has produced the demand for repressive legislation, for the gains of the drift-net fishermen are much affected by the sudden and great captures of the trawler, who, working with less capital and with a more productive kind of labor, is able to undersell the drift fishermen, and to derange the market for the curers."

It happened that in 1860, the last year of trawling before its complete suppression, the fishing in Loch Fyne was the largest ever known there; in 1861 it fell off, but in 1862 it was again very large, and that was followed by fluctuations as before, although the drift fishermen then had it all their own way. The recommendations of the two commissions were embodied in an Act (30 and 31 Vict. c. 52) passed in 1867, by which any kind of herring net with what was then the legal mesh was permitted, and trawls so constructed again came into use. By the Sea Fisheries Act, 1868, all restrictions as to the size of mesh were done away, but as that Act only applies to fishing beyond the three-mile limit, the Act of 1867 still regulates the fishing in Loch Fyne. It chanced that from 1868 to 1874 the produce of this loch gradually fell off from 46,813 barrels to 6934 barrels; the herrings did not go to the upper waters of the loch in the same numbers as before, and we need hardly say that the drift fishermen accounted for it mainly by the fact that trawling had again been permitted. The drift fishermen had little belief in the two commissions which had reported that trawling had done no harm; but in 1874, when matters were at their worst, three Scotch gentlemen of position, who were likely to command the confidence of the fishermen, formed themselves into a private committee to inquire into the causes of the failure in Loch Fyne. The result as regards the effects of trawling in keeping away the herrings may be best given in their own words:—"The fact cannot be explained away that the fish seem to be at present disinclined to enter other narrow waters where trawling is unknown."[1] The idea, however, that the opinions of these gentlemen would be received with respect has proved to be a mistaken one; and the fact that three inquiries had resulted in the same conclusions seemed only to make these fishermen the more determined to clamor against trawling. In 1877 a fourth commission was appointed; its object was to examine into the condition of the Scotch herring fisheries generally, and the state of the Loch Fyne fisheries was therefore once more investigated. Yet, notwithstanding that the produce of this loch had increased from 6934 barrels in 1874 to 15,097 in 1875, and to 34,471 in 1876, with a further increase in 1877, so far as the returns had been made up at the time, all the old statements were again brought forward by the drift men. But the facts against them appear to have been too strong, and this last commission, like the three previous ones, has declined to recommend that trawling should be suppressed.

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[1] *Report of the Royal Sea Fisheries Commissioners*, p. 43 (1866).

Average produce of Loch Fyne.

There is abundant evidence in the records for a great number of years that the annual produce of Loch Fyne has been subject to large fluctuations. But if we compare successive periods of ten years each we shall find that not only are the average total catches in recent years far in excess of those in earlier times, but the average for each boat has very largely increased. The following official record for periods of ten years is very instructive:—

Period.	Average No. of Boats.	Average No. of Barrels.
1827–1836	300	3,469
1837–1846	350	7,388
1847–1856	396	19,949
1857–1866	558	33,096
1867–1876	479	25,561

The average for the ten years 1857-66 was much raised by the enormous catch of 79,893 barrels in 1862, whilst the small number of 6934 barrels only being taken in 1874 has materially lowered the average for the last ten years.

Produce of west coast of Scotland.

If we now look at the produce of the fishery on the whole west coast of Scotland for the last thirty years, taking the average in periods of ten years as before, we find the following:—

Years.	Average Catch.	Highest Catch.	Lowest Catch.
1847–1856	85,837	109,806	56,206
1857–1866	122,154	173,827	83,218
1867–1876	156,988	226,037	83,892

The quantities here given are in barrels, as usual; and the figures in this and the preceding return are taken from the statistics carefully prepared by Mr. George Reiach, assistant inspector under the Board of Fisheries, and furnished by him to the commission in 1877. He had been 27 years in the service of the board, and for the last 14 years the whole of the west coast fisheries had been under his inspection.

Annual returns of herrings.

There is nothing that enables us better to understand the actual condition of a fluctuating industry like our sea fisheries than accurate records of its annual produce. In this respect Scotland, owing to the careful labors of her Board of Fisheries, is in a far more fortunate position than either England or Ireland; and the following tables taken from the last report of the Fishery Board will readily show, by the comparison of any two selected series of years, the gradually increasing importance of the Scotch herring fishery, notwithstanding the fluctuations arising from unfavorable weather and other natural causes. We may add that considerable quantities of herrings which are sold in the local markets and consumed whilst quite fresh, do not appear in the board's returns, but those which are slightly salted for transit by ship to the great markets are so included. The quantities are in barrels, as before.

ABSTRACT showing the total quantity of White Herrings cured, branded, and exported, year by year, *in so far as brought under cognizance of Fishery Officers*, from the 1st of June, 1809, to the 31st of December, 1877; distinguishing the export to Ireland, to the Continent, and to places out of Europe. The periods for which each Return is made end on the 5th of April down to 1844; from that year to 1852, on the 5th of January; and afterwards on the 31st of December; hence two returns were published in 1852. There were no returns for England after January, 1850, or for the Isle of Man after January, 1869.

Periods.	Total Cured.	Total Branded.	Exported.			Total Exported.
			To Ireland.	To the Continent.	Out of Europe.	
1810	90,185	34,701	28,014	......	7,834	35,848
1811	91,827	55,662	28,212	......	9,921	38,133
1812	111,519	58,430	30,417	4,730	27,672	62,820
1813	153,488	70,027	57,980	11,046	40,669	109,725
1814	110,542	38,184	43,061	23,943	51,399	118,403
1815	160,139	83,376	49,635	35,891	55,778	141,305
1816	162,651	116.436	29,456	15,563	62,668	107,688
1817	192,343	140,018	36,341	44,432	57,855	138,628
1818	227,691	183,089	53,386	43,896	65,057	162,339
1819	340,894	270,022	89,704	52,333	85,125	227,162
1820	382,491	309,700	101,109	64,302	88,104	253,516
1821	442,195	363,872	125,445	89,524	79,836	294,805
1822	316,524	263,205	102,719	34,752	77,485	214,956
1823	248,869	203,110	56,528	38,002	75,914	170,445
1824	392,190	299,631	116,747	40,231	82,652	239,630
1825	347,665	270,844	96,409	35,029	70,577	202,016
1826	379,233	294,422	121,386	28,167	67,519	217,073
1827	288,495	223,606	78,735	16,701	70,970	166,406
1828	399,778	279,317	109,108	24,489	78,061	211,659
1829	355,979	234,827	107.651	28,280	69,944	205,875
1830	329,557	218,418	89,680	24,302	67,672	181,654
1831	439,370	237,085	130,300	61,655	72,947	264,903
1832	362,660	157,839	128,458	31,100	57,941	217,499
1833	416,964	168,359	114,137	47,556	58,991	220,684
1834	451,531	178,000	149,254	55,852	66,987	272,093
1835	277,317	85,079	73,960	34,050	50,795	158,805
1836	497,614	192,317	168,960	48,451	55,982	273,393
1837	397,829	114,192	102,968	46,777	39,520	189,265
1838	507,774	141,552	139,095	57,388	38,674	235,158
1839	555,559	153,659	149,926	64,870	24,934	239,730
1840	543,945	152,231	157,359	82,515	12,647	253,522
1841	557,262	154,189	150,517	90,951	8,668	250,137
1842	667,245	190,922	187,953	91,069	5,713	284,736
1843	623,419	162,713	165,327	120,136	6,336	291,800
1844	665,359	182,988	127,770	181,953	3,793	313,516
1845	526,032	140,632	120,293	143,754	2,326	266 373
1846	532,646	142,473	127,027	113,678	2,488	243,194
1847	607,451	156,278	102,585	148,363	4,765	255,714
1848	562,743	146,500	102,690	142,532	4,959	250.181
1849	644,368	153,944	78,262	168,049	3,682	249,994
1850	770,698	213,286	78,889	257,108	4,258	340,256
1851	544,009	172,024	66,138	198,403	2,367	266,908
1852	594,031	201,636	81,340	182,659	205	264,204
1852	498,787	160,159	60,414	221,979	1,133	283,526
1853	778,039	248,136	95,339	242,853	4,438	342,630
1854	636,562	211,844	121,883	237,893	1,919	361,696
1855	766,703	280,581	97,377	344.029	858	442,264
1856	609,988	223,281	89,670	256,741	1,199	347,611
1857	580,813	218,992	58,534	307,275	1,351	367,160
1858	636,124	233,374	79,054	269,819	1,331	350,204
1859	491,487	158,676	68,882	203,349	748	272,979
1860	681,193	231,913	86.413	291,401	156	377,970
1861	668,828	265,347	81,595	308,334	384	390,313
1862	830,904	364,712	70,879	423,182	847	494,910
1863	654,816	276,880	72,074	333,074	2,612	407,761
1864	643,650	217,392	55,420	307,282	1,805	364,507
1865	621,763	216,785	42,063	309,626	1,012	352,701
1866	658,146	249,510	47,319	328,272	4,474	380,066
1867	825,589	317,421	42,364	432,994	3,345	478,704
1868	651,433	209,462	43,414	323,479	1,850	368,744
1869	675,143	244,522	32,342	346,793	2,197	381,333
1870	833,160	299,381	41 524	486,064	2,970	530,558
1871	825,475	346,633	46,347	502,534	2,724	551,605
1872	773,859	422,731	24,147	523,540	1,943	549,631
1873	939,233	435,274	32,465	633,681	1,861	668,008
1874	1,000.561	517,558	28,137	706,967	2,209	737,314
1875	942,980	523,789	33,434	624,137	3,399	660,970
1876	598,197	252,979	20,333	378,740	1,350	400,423
1877	847,718	397,795	16,085	543,908	1,992	561,985

N. B.—In the six years ending 5th April, 1815, the bounty on herrings cured gutted was two shillings per barrel, while there was a bounty at the same time of two shillings and eightpence per barrel, payable by the excise, on the exportation of herrings, whether cured gutted or ungutted, but which ceased on the 1st June, 1815; in the eleven years ending 5th April, 1826, the bounty on herrings cured gutted was four shillings per barrel; in the four succeeding years the bounty was reduced one shilling per barrel each year till the fifth of April, 1830, when it ceased altogether, and has not since been renewed.

Garvie fishing.

Garvie or Sprat Fishing.—This is carried on to some extent at the upper end of the Firth of Forth, and in the Beauly Firth. In the former locality the garvies are caught by means of trawls (seans), and the principal fishing is on the western side of Inchgarvie. In the Beauly Firth drift-nets are used, and only fish of fair size are taken. Complaints have long been made in both places of the capture of young herrings with the garvies, and the herring fishers have done their best to get the garvie fishery put a stop to; but fortunately they have not succeeded, for this fishery gives profitable employment to a good many fishermen, and there is not a particle of proof that the herring fishing farther out has suffered from the occasional capture of young herrings with the garvies. Sprats are not in much demand in the Scotch markets, and almost all that are taken in the localities mentioned are sent by rail to London. We are sorry to say that the old fallacy of the sprat being nothing but a young herring still prevails among some of the fishermen and curers.

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[1] The Report of these gentlemen is given in full and ably discussed in the *Annual Report* for 1875 of the Board of Fisheries.

Line fisheries. *Line Fisheries.*—The capture of cod, haddock, ling, and saithe or coalfish is general around the coast of Scotland; and the tusk or torsk, a northern species of the cod family, and in shape like a short-bodied ling, is taken in some numbers at the Shetlands, and a few at the outer Hebrides. Long lines are in use for haddock, ling, and tusk, and also for cod on many parts of the coast; but at the Shetlands hand lines are employed for cod and saithe, and also at Faroe and Iceland. At Newhaven, Eyemouth, and other places in the neighborhood in the Firth of Forth, two sizes of long line are regularly worked in the proper season. The smaller or haddock lines have from 800 to 1000 hooks each, or even more, on snoods 14 inches long and 2½ feet apart, and mussels and lug worms are used as bait. Some little interest is attached to the state of this fishery, as it is an important one in Scotland, and a few years ago it was said to have fallen off very much. But it appears there are still plenty of haddocks on the coast, and now that larger and decked boats are used, and the fishermen are consequently more independent of weather, very large takes are not uncommon. In one week in January, 1876, the Eyemouth boats were at sea six times, and landed 20,000 stones of haddocks, which sold at 2s. per stone, producing in that short period no less than £2000. The season lasts here from October to April, and the average gain for the season by each boat usually ranges from £400 to £600. There is a considerable trade in smoked haddocks, particularly from Eyemouth, and the curing consists in soaking the fish in pickle for half an hour, and then hanging them for about four hours in some hardwood smoke. The village of Findon, between Stonehaven and Aberdeen, has long been famous for first preparing the fish known as "Finnan haddies." Their peculiar flavor, which has made them so popular, arises from their being hung in peat smoke. They are cured in the cottages, and some little variation in the time in pickle and in smoke is made according to the time they are intended to keep. This manufacture is now carried on at many places besides Findon. The cod or "great lines" are of the same description as those used for haddock fishing, but have longer snoods, and the hooks farther apart. It is unnecessary to speak of the manner in which these long-lines are worked, as we have fully described it in our notice of the North Sea cod fishery. A vast quantity of line fish is sent to the fresh market, but the great importance of this Scotch fishery is due to the large extent to which curing operations are carried on, and more especially in the distant districts such as the Shetlands and the outer Hebrides.

Curing of cod, etc. Curing is performed in two ways—dry and in pickle. The latter method consists in packing the fish, after they have been split open, gutted, and part of the backbone and the head removed, with layers of salt in barrels; but when to be cured dried, these fish, perhaps caught as far off as the Faroe Islands or Iceland, and landed at the Shetlands, are unpacked, washed, and spread out either on stages or on the beach, and exposed for some days to the air and sun, due attention being given to them to ensure their being evenly dried. When thoroughly cured, they are kept in a cool dry place, until wanted for shipment. The fish caught near the coast are salted as soon as landed, and afterwards treated as the others. The produce of the Shetland fishery is large in itself; but the return of fish cured in those islands is greatly increased by the supplies of fish in pickle landed there for curing by the Grimsby and Shetland smacks, which go every year to Faroe, Iceland, and other more or less distant fishing grounds.

A great deal of the cod and some of the ling go to the Spanish markets and a little to Australia; but the ling and tusk are chiefly sent to Dublin, Glasgow, and Leith, and the saithe to Belfast, Leith, and Dundee.

In 1877[1] the number of fishing boats in Scotland was 14,623, and of fishermen and boys 45,890, and the estimated value of the boats, nets, and lines employed in the herring and cod and ling fisheries was £1,178,412, being an increase over the numbers for 1876 of 76 boats and 627 fishermen and boys, and also an increase of £50,418 in the estimated value of boats, nets, and lines.

ABSTRACT showing the Total Quantity of Cod, Ling, Hake, Saithe, and Tusk, cured and exported, year by year, *in so far as brought under cognizance of Fishery Officers*, from the 10th of October, 1820, when the system for encouragement and improvement of the Cod and Ling Fishery commenced, to the 31st of December, 1877. The periods for which each Return is made end on the 5th of April down to 1844; from that year to 1852 on the 5th of January, and afterwards on the 31st of December. Two returns, therefore, appear for 1852 in the tables. The collection of Returns for England ceased from the 5th of January, 1850, when also the Punching and Branding of Cod and Ling came to an end; and there were no Returns for the Isle of Man after January, 1869.

Years.	Cured dried.	Cured in pickle.	Exported dried.	Years.	Cured dried.	Cured in pickle	Exported dried.
	Cwts.	Barrels.	Cwts.		Cwts.	Barrels.	Cwts.
1822	......	......	19,578	1851	90,658	5,032	22,304
1823	......	......	19,398	1852	92,083	7,019	17,141
1824	......	......	23,098	1852	102,976	6,886	18,994
1825	......	......	14,087	1853	105,591	5,122	22,650
1826	69,136	5,621	7,281	1854	109,684	6,166	19,557
1827	95,161	9,025	14,051	1855	113,561	6,316	29,154
1828	82,515	6,142	13,208	1856	110,504	6,642	29,629
1829	81,321	6,819	20,587	1857	104,668	4,393	34,310
1830	101,914	8,836	16,369	1858	95,596	4,584	32,152
1831	37,674	2,950	11,920	1859	118,383	5,362	35,923
1832	50,293	3,779	20,168	1860	115,688	4,339	32,221
1833	58,461	6,467	14,754	1861	82,344	4,145	26,961
1834	52,710	5,522	16,298	1862	100,657	7,735	32,969
1835	44,152	3,767	10,632	1863	129,725	7,337	53,736
1836	38,040	6,276	10,992	1864	107,758	7,963	46,461
1837	66,892	7,273	10,195	1865	112,807	7,678	44,928
1838	84,996	10,303	22,166	1866	115,819	9,957	47,753
1839	85,279	10,051	26,701	1867	119,638	10,819	46,225
1840	93,560	6,053	29,656	1868	113,831	9,659	52,403
1841	91,494	9,480	30,550	1869	135,585	10,319	51,864
1842	76,849	7,038	25,293	1870	145,288	9,945	56,400
1843	77,207	6,431	23,737	1871	119,030	9,283	54,171
1844	92,813	5,123	35,476	1872	145,976	11,940	53,631
1845	83,919	1,726	28,815	1873	160,716	12,381	70,101
1846	92,323	5,037	29,352	1874	143,466	6,754	60,913
1847	90,783	6,341	34,435	1875	187,788	8,503	81,880
1848	86,624	6,247	25,662	1876	111,457	6,109	59,865
1849	85,463	6,810	22,608	1877	187,200	8,619	73,968
1850	98,903	6,588	24,154				

N. B.—The books of the Fishery Board do not show the total quantity of cod, ling, etc., *cured* till the year commencing 5th April, 1825. The bounty from the earliest date in this abstract to the 5th of April, 1830, was four shillings per cwt. for fish cured dried, and two shillings and sixpence per barrel for fish cured in pickle, taken by the crews of vessels or boats *not* on the tonnage bounty; while the bounty for vessels licensed for the cod and ling fishery, on the tonnage bounty, was fifty shillings per ton, for tonnage and cargo, to the 5th of July, 1826, diminishing five shillings annually to the 5th of April, 1830, when the bounties altogether ceased.

IRISH FISHERIES. IRISH FISHERIES.—After a continuous depression of 30 years, during which the number of boats and fishermen was reduced to less than a third, the Irish sea fisheries showed some indications of an improvement in 1876, the last year[2] for which the inspectors have published their annual report. The difficulty in ascertaining the precise number of boats and fishermen on some of the wilder parts of the coast is so great, however, notwithstanding the important fact that the coastguard is employed in collecting the information, that, as the inspectors tell us, the returns even at the present time cannot be taken as quite trustworthy. There was, however, an apparent increase of 46 craft and 585 fishermen, and this seemed certainly the most encouraging report that had reached us for many years. But an analysis of the return shows that this increase is more apparent than real. The inspectors conveniently divide the boats with their crews into three classes independently of tonnage, and this plan enables us in some measure to understand who are included under the head of fishermen. The divisions come under the following heads, and we give the returns for 1875 and 1876 for the sake of comparison:—

Year.	Solely Fishing.		Mostly Fishing.		Occasionally Fishing.	
	Boats.	Men.	Boats.	Men.	Boats.	Men.
1875	1341	6241	602	1870	3976	14,997
1876	1283	6105	644	2248	4038	15,340

The total number of boats and men in 1876 was—boats 5965, and fishermen 23,693, being a slight increase in both over the previous year. But there is a falling off in the number of regular fishermen, and the increase is only in those who devote part of their time to fishing. We have it on the authority of the inspectors that the men in the third division, or occasional fishermen, are not employed in that occupation on an average for more than one month in the year, and yet we find the boats in this division form more than two-thirds, and the men nearly the same proportion, of the total numbers in Ireland.

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[1] Report of Fishery Board, Scotland, for 1877.

[2] After the above was in type the Inspectors' Report for 1877 has been published. They state that there has been an apparent decrease of no less than 583 fishing boats and 3300 fishermen and boys since 1876; but, as in previous years, they do not appear to have much confidence in the accuracy of the returns. The herring fisheries were better than in 1876, those for mackerel and pilchards not so good; but the total quantity and value of the herrings, mackerel, and cod consigned to the English markets exceeded those of the year before.

The history of the Irish fisheries shows that great fluctuations have taken place at various times, but the last great decline undoubtedly dates from the period of the famine in 1846, and those who have been long acquainted with the west coast fishermen in particular believe that their present depressed state is entirely the result of that disastrous time. Local assistance has been given time after time with only a temporary improvement; and now the experiment is being tried of advancing money from the Irish Reproductive Loan Fund to enable the fishermen to provide the necessary gear for fishing. The applications for loans have been, as was expected, far in excess of the amount available for the purpose, and in very many cases no security could be obtained that the money would be expended in the manner proposed. No doubt some good will be done by these loans, but much lasting advantage is not to be expected from the system. Emigration has carried off thousands from the country, and mainly from the west coast, where, however, the majority of the fishermen were little more so than in name, and fishing was never allowed to interfere with sea-weed cutting, farming, and any chance occupation. There is this to be said, however, that on very many parts of the west coast of Ireland the weather is frequently so bad, and the seas so stormy that fishing cannot be carried on with any regularity; and when favorable times arrive, the neglected boats and fishing gear are too often unfit for use. On the east and south coasts things are in a better condition; important fisheries for herrings and mackerel in their seasons there provide profitable employment not only for Irish fishermen, but for large numbers of Cornish, Scotch, and Manx fishing boats, which until the last year or two have far outnumbered the native craft. There is plenty of fish to be caught on the Irish coasts; and the influence of the strangers is telling on many of the Irish fishermen, and leading them to improvement in their boats and all that relates to carrying on their work.

The principal methods of fishing in Irish waters are trawling, drift-fishing, and line fishing; there is also a little done with seans and trammels.

Trawling.

Trawling.—Dublin is the headquarters of the deep-sea trawlers, and possesses a fleet of about 50 smacks, ranging from 30 to 50 tons, and working chiefly from that station. Deep-sea trawlers were first used from Dublin in 1818, when, as previously mentioned, some Brixham boats and fishermen were brought over. The fishing was found to be profitable, and the fleet of smacks was gradually increased until it reached its present size. The trawlers work throughout the year when they can get sufficient hands, but the light summer weather is not very suitable for them; and the attractions of the herring fishery and profitable employment on board yachts take away a great many men for several weeks from their ordinary occupation. The principal trawling grounds lie within a triangular space between Dublin and Dundrum Bays and the Isle of Man, and consist of a number of patches differing in shape and extent, which are worked over, either on the inner or outer grounds, according to the season. The Isle of Man ground, lying in deep water, and a favorite place for soles, is usually fished from March to July. In January there is a partial migration of the trawlers to the south of Ireland, and a very productive fishing place known as the Saltee ground, and about south-west from the Saltee lightship, near Waterford, is worked by them with advantage. Farther out at sea, at a distance of 30 or 40 miles from the land, and without any very clearly defined limits, is what has long been spoken of as the Nymph Bank.[1] Extraordinary results have been anticipated from fishing this ground, and no doubt there is plenty of fish upon it; but there are difficulties in working it properly, partly on account of many scattered rocks which interfere with trawling on it generally, and partly because of a want of organization for bringing in the fish and sending them to market. For a long time the greatest difficulty encountered was from the local fishermen, who would not work in a deep-sea trawler, or allow one to use her nets anywhere within the headlands, although the weather was too bad to go outside. Companies have been formed for trawling from Waterford harbor, but the determined hostility of many of the native fishermen, and the fears of others in consequence, have done more to discourage trawling there on a large scale than anything else. English crews have been tried, but it is not surprising that they should be unwilling to remain in a locality where the feeling against them was so strong. Matters seem to have improved of late, but a good deal of enterprise is needed to carry on the fishing in the way in which it might be done. Trawling is worked in the shoaler parts of Waterford harbor by the local fishermen; and the complaint made by them that the large trawlers did so much mischief in destroying the young fry, whilst the small boats habitually worked where the young fish were most abundant, was not too absurd to be listened to by the inspecting commissioner of fisheries a few years ago. A bye-law was therefore established (probably with the object of preserving the peace) to keep the large trawlers beyond a certain depth of water, and the small ones then had it all their own way inside. Under the present more enlightened system of inspection the tendency is happily to remove restrictions to fishing rather than to make them; and the results of a systematic search for spawn in the Irish bays are reported to have been such as to refute completely the charges brought against the trawlers of destroying it.

Drift fishing.

Drift fishing.—Two of the most important fisheries in Ireland are those for herrings and mackerel. That for herrings is carried on more or less on many parts of the coast, but its chief seat is in the Irish Channel, with Howth, the northern point of Dublin Bay, and Ardglass, opposite the Isle of Man, for its headquarters. The fishery begins at the end of May or beginning of June, and lasts well into September, or in some parts into October. By July it is in full work, and the two stations above mentioned are then the scene of unusual life and activity, for a very large proportion of the fish landed there is at once packed and sent off fresh to the English and Scotch markets. A little curing is done at Howth, but it better answers the purpose of the Irish people to send their own fish fresh to market, and to import cured fish from Scotland. The question of introducing the branding system into Ireland has recently been considered by the inspectors of fisheries, and inquiries were held on various parts of the coast in order to find out the general feeling about it. The inspectors say, however, in their report for 1876:—"With regard to branding, we felt it our duty to report that under existing circumstances we were unable to recommend extension of the system to Ireland—there being, firstly, no *bona fide* desire for it existing amongst the Irish fishermen or curers; and, secondly, that the fish caught in Ireland and sold fresh realized a much higher price to the captors than the price received by the fishermen in Scotland and cured for the foreign markets, and that no material benefit would therefore really be derived from such extension."

Ireland is in fact well off in having a market across the channel for any quantity of fresh fish she may send over; and a large proportion of the herrings and trawl fish caught on the east coast, and almost all the mackerel taken in the Kinsale fishery, are at once despatched there. The drift fisheries are, as before mentioned, by no means monopolized by the Irish fishermen, but are taken part in by a large number of strangers. The inspectors in their report for 1876 tell us that "the highest number of boats of each country at Howth during the season was—Cornish 206, Irish 209, Scotch 224, Manx 133. At Ardglass the highest average number that fished during one day (23d July) was —Scotch 140, Manx 20, Irish 42, Cornish 19." These figures show a slight increase in the Irish boats over those in previous years. The east coast fishermen have of late shown many signs of improvement; and the better boats and steady industry of the Manx, Scotch, and Cornish fishermen have not been without their use as examples of how to work the fisheries with profit.

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[1] Mr. Fraser mentions that in 1726 a proposal was made by Mr. William Doyle, hydrographer, for supplying the large English markets with fish preserved in well-boats, from the southern coast of Ireland, and particularly from a fishing ground he states he had discovered, unto which he gave the name of Nymph Bank, from a vessel called the "Nymph," which he employed in the examination of this fishing ground.—*Review of Domestic Fisheries*, p. 4 (1818).

Kinsale mackerel fishery.

Kinsale has in recent years come into notice as the great station for the mackerel fishery. This fishing begins early in March and goes on till about the end of June, thus immediately preceding the herring season. In 1876 there were 217 English and Manx boats, 13 Scotch, and 133 Irish engaged in this fishery, besides more than 60 large French luggers, the last-mentioned boats salting their fish as soon as caught, and returning home when they have made their cargo. The mackerel fishery is a very important one for Kinsale, as it gives employment, not only to the fishermen, but to numerous other persons of various descriptions. The mackerel are almost all packed in ice and sent to England. During the season of 1876 there were 7 steamers and 11 cutters in this carrying trade,—the former at a monthly expense of £350 to £400 for each vessel, besides paying all dues, coals, and pilotage; and 4400 tons of ice were imported solely for the package of the fish. The mackerel are packed in boxes containing a "hundred," or six score of fish in each, and the official returns show a total capture of 139,083 boxes full in the season of 1876. The prices ranged from 12s. to £5 per box in the course of the regular season; but some boats made a large catch afterwards in July, when there was little demand for the fish, and prices then went as low as 3s. per 100.

Exports of fish from Ireland.

The following is a summary of the quantity of herrings, mackerel, and cod exported from Ireland to the undermentioned places in England during 1876:—

	Herrings.	Mackerel.	Cod.
	Boxes of 2 cwt.	Boxes of 2 cwt.	Boxes of 2 cwt.
London	31,606	29,500	11,882
Nottingham	3,552	2,770	4,829
Bradford	6,977	3,805	3,001
Manchester	17,555	9,721	9.854
Sheffield	7,819	5,583	2,465
Wolverhampton	5,521	4,078	2,098
Leeds	6,998	5,282	2,953
Liverpool	21.763	14,017	12,000
Birmingham	12,204	4.894	5,987
Total	113,995	79,650	55,069

Herrings valued at £2 per box	£227,990
Mackerel,[1] 139,083 boxes at an average of 16s. per box	111,266
Cod at £3 per box	165,207
Total value	£504,463

It will be seen from the above figures that the Irish fisheries are by no means wanting in importance, and it is much to be regretted that the fishermen of the country do not take a larger share in working them. The produce of the deep-sea trawl fishery is also very valuable, but we can give no return of the considerable quantity of trawl-fish sent to England.

Proposed pilchard fisheries.

It has been a matter of surprise to many that no systematic attempt has been made to catch the large shoals of pilchards which annually visit the south coast of Ireland. The prejudice of the Irish fishermen against pilchards has been so great as to almost dishearten the inspectors in their repeated endeavors to bring this fishery into notice. Whilst the great Cornish sean-fisheries have been languishing because the shoals of pilchards have not come into the bays within reach of the nets, they have been in plenty on parts of the Irish coast. One of the inspectors (Mr. Brady) has been untiring in his exertions to procure every kind of information about the catching and curing of pilchards in the Cornish fashion, in the hope of its leading to the establishment of curing stations in Ireland, but little progress has yet been made. The inspectors, however, continue to be hopeful in the matter, and in their report for 1876 they say:—"No efforts have yet been made to cure for the Continental markets, but some have been cured for home consumption on various parts of the coast. By degrees this fish is being regarded with more favor by the country people, and if they continue to frequent our coast as they have now done for some years, there is little doubt but that a considerable trade will result, as they come more into favor."

We have now referred to all the important Irish sea fisheries. It may be added that line-fishing is more or less general around the coast, and is perhaps more systematically attempted on the north and west sides than elsewhere.

MANX FISHERIES.

MANX FISHERIES.—The fisheries carried on from the Isle of Man do not call for special notice, as they are practically those of the Irish sea, and in which the industrious Manxmen always take a prominent part.

British crab and lobster fisheries.

MINOR BRITISH FISHERIES.—*Crab and Lobster Fisheries.*—The demand for these crustaceans has increased so much within the last few years that the supply from the coasts of Britain has been insufficient, and from 400,000 to 600,000 lobsters have for some little time been annually imported from Norway. They travel without much loss in vessels fitted with wells; and for journeys lasting no longer than two or three days they will live very well if packed with wet seaweed in boxes. The places from which the principal home supplies are sent to the large markets being now mostly within easy reach of railways, there is little occasion to use welled vessels for collecting them.[2] The English markets are mainly supplied from Cornwall and the south coast of England, from the Orkneys and Hebrides in Scotland, and from the west coast of Ireland. Besides these, about 200,000 come from France, the fishery for them being in the neighborhood of Cherbourg, and a few from Sweden. The means adopted for catching lobsters and crabs in the British Islands are either circular basket-work "pots" with a mouse-trap entrance at the top, or cages covered with netting and with one or two entrances as in the pots. These cages are commonly called "creels." Crabs are taken in most abundance in the west and south of England, and more or less generally on the east coast, and in Scotland and Ireland, those from parts of Devon and Cornwall being the finest which are sent to market. There is a general disposition on the part of the fishermen to submit to some law limiting the size of both crabs and lobsters to be offered for sale, so as to put a stop to the falling off in these fisheries, which is apparent on some parts of the coast. A close-time is objected to, as no month in the year is generally suitable, and "berried" lobsters are so valuable for the market that if they had to be returned to the sea the fishermen would lose a great part of their present profits. A limit to the size allowed to be sold seems therefore to be the best means of protecting these fisheries; and such a law is now enforced on the coast of Norfolk.

Shrimps and prawns.

Shrimp and Prawn Fisheries.—The most important of these fisheries are carried on in the estuary of the Thames, Pegwell Bay near Ramsgate, and Morecambe Bay on the Lancashire coast, but they are more or less general wherever suitable ground is met with. Leigh is the headquarters of the Thames shrimpers. They fish with a net mounted very much like a beam-trawl, but having a long, straight piece of wood at the lower part of the mouth to work over the ground instead of the ordinary ground-rope. This is, in fact, like the common form of hand-shrimping net, but so fitted as to be towed instead of pushed. Ordinary trawls are used for prawns or "red shrimps," and in some other places for true shrimps. The supply of shrimps from Leigh sometimes amounts to 2000 gallons in a day.

Oyster fisheries.

Shellfish: — Oysters, Mussels, Whelks, Periwinkles.—The oyster fisheries of the British Islands have been in a failing condition for some few years past, owing to a deficiency of spat, the cause of which has been the subject of active controversy, not only between rival theorists, but also among practical fishermen. Over-fishing has been regarded by many as the main cause of the decrease, and it may possibly have helped to make matters worse than they would otherwise have been; but it is difficult to explain in this manner the fact that in England, Scotland, and Ireland there has been a general failure of spat for some years past, on all kinds of ground and under every condition, in public and private beds, and whether they have been carefully protected, as in the case of old established private companies, or left to the working of the general public, except during a definite close-time, more or less enforced. In Ireland, where there are regulations for close-time, and restrictions as to the size of oysters allowed to be sold, and where in some cases all fishing has been stopped for two or three years, the decrease of oysters has been as decided as in England or Scotland;

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[1] 139,083 boxes of mackerel were recorded, and most of them were exported, but the returns of exports are incomplete.

[2] *Report of Commission on Crab and Lobster Fisheries*, p. ii. (1877).

and Mr. Blake, until recently one of the inspectors of Irish fisheries, and chairman of the oyster commission in 1868, stated in his evidence given before the select committee of the House of Commons in 1876 that the decline in the oyster fisheries was due to the bad spatting seasons, and to the great increase of dredging; "but if the spatting went on as it formerly did, the amount of dredging would not be of much importance."

The bulk of English supplies is obtained from the oyster beds of private companies, of which the Whitstable company is the most ancient, having worked from time immemorial on their present ground on the south shore of the entrance to the Thames. In 1793 they purchased from the lord of the manor the exclusive right of fishing there. The company is a corporation of fishermen governed by elected members of their own body. The men are paid for the daily work done by them, and each member of the company also receives his share of the profits on the sale of the oysters. A great part of their employment, besides dredging and keeping their own ground clean and free from vermin, consists in dredging for spat in the public portion of the river for the purpose of laying it down on their own beds. A general failure of spat, such as there has been in recent years, is therefore not only felt by them on their own limited ground, but they suffer from the scarcity in what may be called their reserves. The Whitstable company is, however, only one among many which occupy the shores of the Thames estuary and the small rivers which flow into it. The oysters thus laid down or bred in these situations become remarkable for the thinness of their shells, and the good flavor and comparatively large size of their contents, and are what are known as "natives." There are numerous companies or individual proprietors engaged in cultivating oysters on various parts of the coast, but at the present time they are, we believe, all more or less suffering from deficiency of spat. Channel or deep-sea oysters are generally large and coarse, and do not fetch more than one-tenth of the price given for the more delicate "natives." Attempts at the artificial cultivation of oysters have not met with much success.

Mussels and whelks.

Mussels and *whelks*, while in some request for food among the lower classes, are in especial demand for the purposes of fish-bait, and the value of mussels in this respect has recently led to a more careful protection of the older banks, and some attempts at the cultivation of new ones. Whelks are particularly valuable in the North Sea cod fishery, and a number of vessels from Grimsby are regularly engaged in fishing for them. Their mode of catching them is by means of shallow hoop-nets baited with refuse fish, and sunk to the bottom on suitable ground. In these the whelks collect in large numbers, and are caught without any difficulty. A considerable supply is also obtained from the oyster dredgers; and at the mouth of the Thames they are caught largely by using "trots" or bulters—long-lines of small dimensions; but instead of having baited hooks, they have common small shore-crabs threaded on the snoods, about twenty on each. These are seized by the whelks, and so firmly held whilst being devoured that the line may be easily hauled in without disturbing the numbers found on every snood. *Periwinkles* are all procured between tide-marks, and are of course collected by hand. The London market is mainly supplied from the western islands of Scotland, the Orkneys, the Shetlands, and parts of the Irish coast.

Periwinkles.

British American fisheries.

British North American Fisheries.[1]—The principal fisheries coming under this head are for cod, herring, and mackerel, including the long-famous cod fishery of Newfoundland The fisheries of the Dominion of Canada are chiefly carried on with open boats, and consequently are to a great extent, though subject to some variation, what may be called shore fisheries. The proportion, as given by Professor Hind, of the shore fisheries to the deep-sea fisheries, in which decked vessels are employed, is 4·4 to 1, so that "by far the largest proportion of the fishing industry of the Dominion is pursued in coastal waters, and much of it rarely extends beyond the limit of three marine miles from the coast line." The following table shows the number of boats and vessels, with the aggregate number of men employed in each, in 1876:—

	Boats.	Men.	Vessels.	Men.
Nova Scotia............	9,585	18,093	653	6,049
New Brunswick........	3,850	7,322	463	1,794
Quebec	5,815	10,777	256	1,219
Prince Edward Island	991	3,831	7	35
Total.................	20,241	40,023	1,397	9,097

In the Newfoundland fisheries boats and vessels are also used, but the deep-sea fishery is scarcely distinct from that pursued in coastal waters, or within the three-mile limit from the shore. The total number of boats employed at Newfoundland in 1874 was 18,611, and the number of persons engaged in catching and curing fish 45,854, while the number of vessels was 1197, with an aggregate of 61,551 tons, and manned by 8394 fishermen sailors. These vessels, however, include the large number used for sealing. The number of "fishing rooms" or portions of the shore set apart for the curing and storing of fish was 8902 in the same year. The numbers of fishing craft, men, and fishing rooms in 1874 showed a considerable increase over those for 1869. Professor Hind, in speaking of the large proportion of inshore fishing, says:—"The changeable character of the weather on the British American coast, the sudden and unexpected occurrence of fogs, the variations of currents produced by tides, the long experience of the dangers attending fishing in open boats some distance from the land, the pecuniary resources of the fishermen, conjointly with the abundant fish resources of the coastal waters, have combined to limit the industry of the British American fishermen in a great measure to the immediate vicinity of the shore line, and within easy reach of harbors. This is particularly the case with Newfoundland." This inshore fishery, however, depends for its success on the supply of bait fishes, especially the capelan and herring; and, as in every kind of fishery, there are years when migratory fish, those which more or less change their quarters at particular seasons, vary in abundance in certain localities, and sometimes forsake one part of a coast and go to another, so the important fisheries dependent on these movements are subject to fluctuations. The cod, in fact, there follow the bait-fishes precisely as, on the English coast, the cod and coalfish become most numerous near the land when the shoals of herrings come closest in. On the coasts of British North America the fishing interest is almost entirely concerned with species whose natural habitat is in cold waters; and as an immense area of fishing water is there influenced by the Labrador current, it is not surprising that cod, holibut, herring, mackerel, and others should be found in abundance on these coasts. The mackerel has also an extensive range south along the coast of the United States; but the Labrador current is little felt south of Cape Cod, its influence being there almost destroyed by the Gulf Stream. The really cold-water species are therefore mainly found in the Dominion seas; and the fact that American fishermen so systematically work there for them is the ground on which the Dominion claim for compensation from the United States Government was based. The sum recently awarded to the colony by the arbitrators is much less, however, than the amount of the claim.

The methods of fishing in use in the Dominion and Newfoundland waters are of the same kind as in the British Islands, with the exception of beam-trawling, which seems to be practically unknown on the American coasts. Herrings are taken by drift-nets, anchored nets, and seans; mackerel by seans and hook and line; capelan by seans; and cod and its allies by long-lines or bulters—there, strange to say, known as "trawls."

Professor Hind states (at p. 58 of pt. 1 of his report) that the aggregate number of barrels of herrings caught in Dominion and Newfoundland waters in 1874 may be put down at—

Dominion waters........................	534,307 barrels.
Newfoundland waters.....................	271,382 "
Total........	805,689 barrels.

This number does not include the quantities used for manure or bait; and he adds:—"A million barrels of herring each year, and gradually increasing, will fairly represent the quantity of this fish taken from British American seas." In the same year 164,879 barrels of mackerel were taken in Dominion waters, of which 80 per cent. were caught on the coast of Nova Scotia. The mackerel fishery at Newfoundland appears to have been very small for some years; and the fishermen do not now seem to be well provided with the means of catching them; but there is reason to believe that this fishery might be largely increased in the Dominion waters if more attention were given to it. There is a very great demand for mackerel in the American market. The Newfoundland and Dominion cod fisheries are, as we have mentioned, almost entirely inshore fisheries, and the abundance or scarcity of capelan or other fishes there used as bait materially affects the success of the fishery, for if the bait fishes do not come inshore, there is no attraction for the cod. In the deep-sea fishery on the banks the case is different; but they are almost neglected by the Dominion and Newfoundland fishermen, for reasons previously stated. The produce of the inshore cod fisheries, although fluctuating, shows no signs of being exhausted. The following table, it is believed, represents with tolerable accuracy the catch of cod and allied fishes on the Dominion coasts in the years stated:—

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[1] An elaborate and in many respects valuable Report, by Professor Henry Youle Hind, M. A., of the Fishery Commission, Halifax, published so recently as 1877, has largely supplied us with materials for our notice of the fisheries of British North America.

Year.	Quintals.	Year.	Quintals.
1869	730,928	1873	1,405,804
1870	801,553	1874	1,278,499
1871	964,131	1875	1,193,579
1872	1,372,207		

The export of dried cod in quintals from Newfoundland in the years 1869–1876 was:—

Year.	Quintals.	Year.	Quintals.
1869	1,204,086	1873	1,369,205
1870	1,213,737	1874	1,609,724
1871	1,328,726	1875	1,136,235
1872	1,221,156	1876	1,364,068

The British American fishery for lobsters is of some importance, and cod roes and livers are among the valuable articles of export.

The French fisheries at Newfoundland are carried on both on the banks and near the island, the craft employed being of various sizes, ranging from vessels averaging about 170 tons down to open boats. The following table[1] gives the number of craft of all kinds and the total number of men in each year from 1867 to 1874:—

Year.	Vessels, etc.	Men.	Year.	Vessels, etc.	Men.
1867	804	7178	1871	665	5295
1868	774	6552	1872	865	5620
1869	806	6452	1873	899	6036
1870	833	6397	1874	847	5621

Of the numbers of fishing craft here given about 70 per cent. are boats. The produce of the French Newfoundland fishery in 1872 was said to be 10 million francs.

United States fisheries.

UNITED STATES FISHERIES.—These may be divided into warm-water and cold-water fisheries, the latter being for the most part carried on in British American waters. The cod fishery formerly prosecuted off the coast of New England, in the cold water north of Cape Cod, is said to have seriously decreased, and it is believed by Professor Baird, the commissioner of fish and fisheries, that the failure is largely due to the diminution of alewives and other bait-fishes, caused by the numerous dams and obstructions in the rivers in which these fishes were accustomed to spawn. The young fish formerly produced in such myriads are now said to be comparatively few, and the cod and allied fishes consequently have less food to attract them to the old haunts. As there is no reason to suppose that cod, as a species, are diminishing in numbers the conclusion obviously is that they are seeking other feeding grounds. The warm-water fisheries include the pursuit of a variety of fishes, but the "scup," a kind of bream, and the "blue-fish," both migratory species, are those whose capture is thought of most value. Although almost all the shore fisheries are said to be decreasing,[2] Professor Baird, in his elaborate reports to the United States Government, does not seem to be quite clear as to an effectual remedy. The pounds and weirs are said to be very destructive to spawning fish, but they supply a large quantity of fish to the markets. The scourge of the American coast appears to be the blue-fish, "destroying ten times as many fish as they really need for food, and leaving in their track the surface of the water covered with the blood and fragments of the mangled fish."[3] Professor Baird estimates that in 1871 there were 100 millions of these fish on part of the American coast, and that each one destroyed twenty fish per day; and as the blue-fish season lasts from 120 to 150 days, some idea may be formed of the extent of the mischief caused by them. Fortunately the blue-fish is in great request as an article of food, and about a million and a quarter were captured in 1871, or, as estimated, one in a hundred of those on the coast. To the blue-fish Professor Baird assigns the very first position among the injurious influences that have affected the supply of fishes on the coast. The agency of man he places next,—the pounds and weirs along-shore catching spawning-fishes, and the dams and other obstructions in the rivers preventing certain species from ascending to their proper spawning grounds. He proposed to limit the working of the pounds and weirs to a certain number of days in each week, and to do away as much as possible with the river obstructions. The blue-fish is beyond control.

The estimated value of the United States sea fisheries in 1876 was—

Warm-water fisheries	$3,274,138
Cold-water "	9,756,683
	$13,030,821

The comparative value of the cold-water fisheries of the United States and of British North America for the years 1870–6 is shown in the following table[4]—the greater portion of the value in the United States return being from fish caught in British American waters:—

Year.	United States.	British North America.
1870	$5,313,967	$14,260,298
1871	11,482,410	16,086,081
1872	9,526,647	16,524,644
1873	8,348,185	18,793,953
1874	9,522,553	20,193,596
1875	10,747,579	18,193,214
1876	9,756,683	18,707,328

American oyster fisheries.

The oyster fisheries of the United States are on a very large scale, and the coast line generally appears to abound with suitable localities for the production of these favorite mollusks. The oysters are all of a more or less elongated form, and of large size, sometimes growing to a length of 12 or 15 inches. They are obviously more suitable for cooking than for consumption in a natural state; and it is therefore not surprising that they are unable to compete with the favorite "native" in the English market. The trade in oysters in the principal cities of the United States in 1859 was estimated as follows:—[5]

	Bushels.
Virginia (State)	1,050,000
Baltimore	3,500,000
Philadelphia	2,500,000
New York	6,950,000
Fair Haven	2,000,000
Other cities	4,000,000
Total	20,000,000

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[1] *Report on Newfoundland and Labrador Fisheries*, 1875, by Captain Erskine, R.N.

[2] Professor Baird says at page 19 of Part i. of his Report—"It is by no means to be inferred from our remarks as to the scarcity of fish that fewer are actually caught now than formerly at any time, the contrary, perhaps, being the case, since by means of the improved methods of capture, in the way of pounds and nets, an immense supply is taken out at certain seasons of the year, so as frequently to glut the markets. The scarcity is better shown by the great difficulty experienced by line fishermen in securing a proper supply throughout the year, on grounds where they were formerly able to catch all they needed for their own use and for sale."

[3] Baird, *Report* for 1871 and 1872, part i. p. 23.

[4] *Report of Fishery Commission*, Halifax, part ii. p. 63.

[5] Report by Lieutenant P. de Broca to the French Government, 1862, given in *Report* by Prof. Baird, pt. iii. p. 282 (1876).

Norwegian and Swedish fisheries.

Norwegian and Swedish Fisheries.—The important fishery of Norway is that for cod, and the special seat of it is at the Lofoden Islands. In 1876[1] the fishery was very successful, more than 22 millions of fish having been taken, a larger catch than in any previous year since 1860, excepting 1875. Of this number about 16 millions of fish were salted, and most of the remainder dried. The average price on the spot was £1, 6s. 8d. per 100. The Finmark cod fishery in the same year fell off very much, as will be seen by the following returns for the years 1872–6:—

1872	11,500,000 cod.
1873	16,000,000 "
1874	17,500,000 "
1875	19,750,000 "
1876	3,500,000 "

The catch of Norway mackerel in 1876 was 1,800,000 fish, and the estimated produce of the herring fishery in that year was 400,000 barrels; but the spring or winter herring disappeared about 1874, and the market has since been supplied with the large northern herring. A remarkable instance of the capricious movements of the herring has just been reported[2] by Mr. F. W. Duff, the British consul at Gothenburg, to the Foreign Office. He states that "great shoals of herrings of the large kind which disappeared from this coast in 1809 have now made their appearance again north of Gothenburg, on the coast in this country. The first appearance of the herring took place at Christmas (1877), when whales were seen following the shoals of herrings towards the coast." This is by no means the first time that herrings have returned to a particular locality after an interval of very many years.

French and Dutch fisheries.

French and Dutch Fisheries.—The French fisheries on the coast of the Channel are of much the same kind as those on the English side—trawling, drifting, and line-fishing. Trawling is carried on to a considerable extent from Boulogne, Treport, Calais, and some other places where there is convenient access to railways; and recently two companies have been established for trawling with steamers along the sandy coast between Arcachon and the mouth of the Gironde. On the coast of Brittany the long-standing fishery for sardines, or, as they really are, young pilchards, is regularly worked. It is remarkable that this fishery is almost entirely dependent for its success on a good supply of cod-roes, in which a large trade with Norway and other places is carried on solely for this purpose, the separated ova of the cod being freely scattered among the sardine nets in order to attract the fish. French and Dutch vessels work regularly in the North Sea for herrings and cod, and the French fish in large numbers along the east coast of England in company with English boats during the herring season. They also take part in the Kinsale mackerel fishery. The French fisheries at Newfoundland have been already noticed; considerable attention is also given by the French to the cod fishery at Iceland. About 200 French vessels visited Iceland in 1877, and during the five years 1872–6 the average annual produce of about 120 vessels from Dunkirk alone was 5 million kilos. of fish, and of oil about 500,000 kilos.[3]

The French oyster fisheries have for many years received considerable attention, and at Arcachon especially great success appears to have attended the cultivation of the beds. Eighty-five per cent. of the oysters obtained from these fisheries are said to be the produce of four or five breeding grounds, Auray and Arcachon being the most prolific. The total produce of all the French oyster fisheries in 1875 reached the enormous number of 97,227,000 oysters.[4]

Echinus fishery.

Echinus Fishery.—On the French and Italian coasts of the Mediterranean the *echini* or sea-eggs, animals belonging to the echinoderm or star-fish tribe, are regularly collected for the market, and are in great request among the poorer classes of the population. They are eaten uncooked, the egg-shaped spiny shell being divided into two parts by a single cut with a knife, and the soft and slippery contents then readily extracted. The echini form part of the various marine productions well known at Naples as *frutti di mare*.

Tripang fisheries.

Tripang Fishery.—The tripang or *bêche de mer* belongs to the order *Holothuriadæ* or sea-cucumbers. Representatives of the group are found in British seas, but by no means so abundantly or of such general large size as in tropical waters. Several species go under the commercial name of "tripang;" they are collected among almost all the islands of the Indian Archipelago down to New Guinea and Australia, and also on the north coast of Ceylon. In shape the tripang resembles a cucumber, but with a circle of short branched tentacles at one end, and surrounding the mouth. The color is generally black, more or less variegated with red or orange, and although sluggish in its movements, the animal has great power of contracting and altering its form. Coral reefs are favorite haunts of the tripang, and it is found in both deep and shallow water. The only preparation it receives after being gutted consists in drying in the sun and smoking over a wood fire. Macassar is the centre of the tripang trade, but the whole produce of the fisheries goes to China, and the trade is entirely in the hands of native merchants.

(E. W. H. H.)

Law relating to Fisheries.

Fish in English law fall under the general principles of the law as to animals *feræ naturæ*. All mankind, says Blackstone, had by the grant of the Creator an original right to pursue them; and this natural right still continues unless so far as it is restrained by the civil law. Accordingly everybody has a right to take fish in the seas, in public rivers, or in private rivers belonging to himself. In private (*i. e.*, non-navigable) rivers the right of fishery belongs *prima facie* to the owners of the land on either side, in public or navigable rivers to the public at large. In both, however, an exclusive right of fishery may exist, by which the presumptive right is excluded; and this, in the case of public rivers, can only take place by grant of the crown. Since Magna Charta the crown can no longer make such grants—at least such seems to be the better interpretation of the words in the statute.

These various rights are more or less roughly distinguished in English law as follows. A *common* fishery is the right of fishing in the sea and public rivers open to all the public. A *several* fishery is the exclusive right of an individual, derived through or on account of ownership of the soil. A *free* fishery is an exclusive right of fishing in public water, derived from royal grant. A *common* of fishery is the right of fishing "in another man's water," like common of pasture, etc. These rights include fish of all descriptions, with this exception that the crown has an old prerogative right to the whale and sturgeon, which, "when thrown ashore or caught near the coast, are the property of the sovereign on account (as it is said in the books) of their superior excellence." A curious distinction is made between the whale and the sturgeon:—*De sturgione observetur quod rex illum habebit integrum; de balena vero sufficit si rex habeat caput et regina caudam.*

As to the mode in which fish may be caught there does not seem to be any restriction at common law. It is a question, however, whether a wear, "by which is meant a fixed structure on the bed of the river, the object of which is, either by means of an apparatus which then catches them or by impeding their progress, to prevent all or nearly all the fish from passing upwards,"[5] is not illegal at common law. In the case of a public river a structure of this sort would be objectionable on the ground of its impeding the navigation, and in a case relating to the River Severn the judges held that the crown could not derogate from the public right of navigation by any grant to erect wears in a public river. The legal writer from whom we have quoted above, while stating that no case had arisen directly on the point in England, Scotland, or Ireland, is of opinion that "both wears and fixed nets, and all other apparatus which prevent fish passing to or fro are illegal at common law and form a good ground of action," even although they may not obstruct navigation. "Though one riparian owner may, by fishing by net or rod at all hours and by means of servants and assistants, almost use up the fish as effectually as by keeping fixed nets, this kind of user could not properly be a cause of action, just as one owner who has a large number of cattle could not be liable to an action at the suit of another who has no cattle, and so makes no use of the water. But it is otherwise where a total obstruction occurs. Hence, even independently of any statute, any fixed apparatus in a river or stream which prevents the fish going up to the other riparian owners is a good cause of action at common law, as it deprives him of one of the natural riparian rights."

A considerable number of statutes have been passed on the subject of fisheries, the most important of which are those relating to salmon. See Salmon.

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[1] *Consular Reports*, part i., 1877.

[2] *Commercial Reports*, No. 2, 1878 (Herring Fishery).

[3] *Consular Reports*, part v., 1877.

[4] See a Report by Major Hayes to the Lord-Lieutenant of Ireland, 1878, which contains an immense amount of valuable information.

[5] *Fishery Laws of the United Kingdom*, by James Paterson, London 1863.

A short Act was passed in 1876 enabling boards of conservators to fix a close term for trout, commencing not earlier than 2d September, nor later than 2d November, and extending over 123 days. A bill for the protection of freshwater fish has passed through Parliament during the present session (1878). Sections 8 and 9 of the Salmon Fishery Act, 1861 (which relate to fishing with light spears and other prohibited instruments, and to using roe as a bait), shall, as amended by the subsequent Salmon Fishery Acts, apply to *trout* and *char* in all waters within the limits of the Act, which are the same as the limits of the Salmon Act. For all other freshwater fish, not migrating to or from the open sea, a close season is established from 1st March to 31st May, both inclusive. Fishing for or dealing in freshwater fish during this close season is subjected to a penalty not exceeding 40s. for the first or £5 for the second offence, recoverable on summary conviction before two justices. The Fisheries (Dynamite) Act is extended to private waters.

The Act 40 and 41 Vict. c. 62 is an Act to amend the law relating to the fisheries of oysters, crabs, and lobsters, and other sea fisheries. The sale of *oysters* is prohibited, in the case of "deep sea oysters," between 15th June and 4th August; in other cases between 14th May and 14th August. Oysters taken in foreign waters, or preserved in tins, or intended for the purpose of oyster cultivation are not within this section. The Board of Trade has power to temporarily prohibit or restrict dredging for oysters on certain banks. *Crabs* measuring less than 4½ inches across the back, or carrying spawn attached to the tail, etc., or having recently cast the shell may not be sold, except for bait. *Lobsters* measuring less than 8 inches "from the tip of the back to the end of the tail, when spread as far as possible flat," may not be sold. *Oysters* are also specially dealt with by the "Sea Fisheries Act, 1868," which is an Act to carry into effect a convention between England and France concerning the fisheries in the seas adjoining the British Islands and France, and to amend the laws relating to British sea fisheries.

International Law.—As between different nations, fishing in the high seas is common to all, while fishing in the territorial waters of any particular state (*i. e.*, within three miles of the coast) is limited to the subjects of that state. Between France and England the rights of fishing in the seas adjacent to both countries are regulated by the convention and Act of Parliament cited above. Between England and the United States questions of great importance have arisen as to their respective rights of fishing in North American waters. Mutual concessions were made by treaties in 1818, 1854, and 1871. The last was the Treaty of Washington, by which "the inhabitants of the United States are to have in addition to their rights under the treaty of 1818, in common with British subjects, for ten years from the date of the treaty and until the end of two years after notice has been given by either party, the right to take fish of every kind except shell-fish on the sea coasts and shores, and in the bays, harbors, and creeks of the provinces of Quebec, Nova Scotia, and New Brunswick, and the colony of Prince Edward's Island, and of the several islands thereto adjacent, without being restricted to any distance from the shore, with permission to land upon the said coasts and shores and islands, and also upon the Magdalen Islands for the purpose of drying their nets and curing their fish." Salmon and shad fisheries and all other fisheries in the rivers and mouths of rivers are reserved for British subjects. Exactly similar rights are granted to British subjects on the eastern sea coasts and shores of the United States north of the 39th parallel of north latitude. But inasmuch as the English Government insisted that the privileges granted to the United States were of greater value than those conceded to England, it was agreed that commissioners should be appointed to determine the amount of any compensation which ought to be paid to the English Government in consideration of such excess. The commissioners have recently made an award finding the sum of £1,000,000 to be due from the United States to England. Certain places designated in the abrogated treaty of 1854 are to be excepted from the operation of the treaty as "places reserved from the common right of fishing." (E. R.)

FISHES. See ICHTHYOLOGY and PISCICULTURE.

FISHING-FROG, also Frog-fish or Sea-devil (*Lophius piscatorius*), a fish well known off the coasts of Great Britain and Europe generally, the grotesque shape of its body and its singular habits having attracted the attention of naturalists of all ages. Its head is of enormous size, broad, flat, and depressed, the remainder of the body appearing merely like an appendage. The wide mouth extends all round the anterior circumference of the head; and both jaws are armed with bands of long pointed teeth, which are inclined inwards, and can be depressed so as to offer no impediment to an object gliding towards the stomach, but to prevent its escape from the mouth. The pectoral and ventral fins are so articulated as to perform the functions of feet, the fish being enabled to move, or rather to walk, on the bottom of the sea, where it generally hides itself in the sand or amongst sea-weed. All round its head and also along the body the skin bears fringed appendages resembling short fronds of sea-weed, a structure which, combined with the extraordinary faculty of assimilating the color of the body to its surroundings, assists this fish greatly in concealing itself in places which it selects on account of the abundance of prey. To render the organization of this creature perfect in relation to its wants, it is provided with three long filaments inserted along the middle of the head, which are, in fact, the detached and modified three first spines of the anterior dorsal fin. The filament most important in the economy of the fishing-frog is the first, which is the longest, terminates in a lappet, and is movable in every direction. There is no doubt that the fishing-frog, like many other fish provided with similar appendages, plays with this filament as with a bait, attracting fishes, which when sufficiently near, are engulfed by the simple act of the fishing-frog opening its gape. Its stomach is distensible in an extraordinary degree, and not rarely fishes have been taken out quite as large and heavy as their destroyer. It grows to a length of more than 5 feet; specimens of 3 feet are common. Young individuals are somewhat dissimilar in shape to old ones, and are provided with more numerous and longer appendages and filaments. The British species is found all round the coasts of Europe and western North America, but becomes scarce beyond 60° N. lat.; it occurs also on the coasts of the Cape of Good Hope. A second species (*Lophius budegassa*) inhabits the Mediterranean, and a third (*L. setigerus*) the coasts of China and Japan.

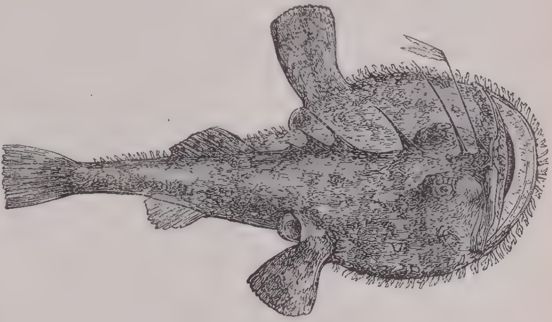
FIG. 1.—The Fishing-Frog (*Lophius piscatorius*).

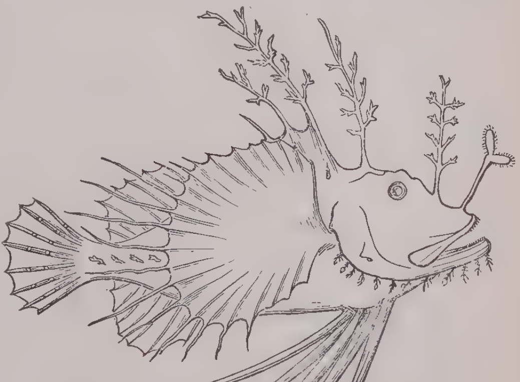
FIG. 2.—A young Fishing-Frog.

FISTULA, a term in surgery used to designate an abnormal communication leading either (1) from the surface of the body to a normal cavity or canal, or (2) from one normal cavity or canal to another. These communications are the result of disease or injury. They receive different names according to their situation:—*lachrymal fistula*, in connection with the lachrymal apparatus; *salivary fistula*, in connection with the salivary duct on the cheek; *anal fistula*, in connection with the anus; *urethral fistula* in connection with the urethra,—are all examples of the variety of the first kind of fistula; while *recto-vesical fistula*, a communication between the rectum and bladder, and *vesico-vaginal fistula*, a communication between the bladder and vagina, are examples of the second. The abnormal canal may be straight or tortuous, of considerable diameter or of narrow calibre. Fistulæ are formed in various ways:—(1) by an obstruction of the normal channel the result of disease or injury, which prevents, for example, the tears, saliva, or urine, as the case may be, from escaping; their retention gives rise to inflammation and ulceration, and the result is that they make a way of exit behind the obstruction; (2) by the formation of an abscess near, for example, the anus, which bursts into the gut and through the skin; the cavity does not close, and a *fistula in ano* is the result; (3) by destruction, by injury or ulceration, of the septum between one cavity and another, as in *recto-vesical fistula*, or between a cavity and a canal, as in *vesico-vaginal fistula*. The fistulous channel will remain patent as long as the contents of the cavity or canal with which it is connected pass along it in whole or in part. There is always a natural tendency to contraction. The treatment is founded on these principles:—remove the obstruction, encourage the flow along the natural channel; for example, open up the nasal duct, allow the tears to reach the nasal cavity, and the *lachrymal fistula* will close; so also in the *salivary* and *urethral* varieties. Sometimes it may be necessary to lay the channel freely open, and allow it to close from its deeper parts to the surface as in *anal fistula;* in other cases it may be necessary to pare the edges of the abnormal opening and stitch them together, hoping for union of the edges.

FITCH, John (1743–1798), one of the first inventors in connection with steam navigation, was born at Windsor, Connecticut, January 21, 1743. He was the son of a farmer, and received the usual common school education. At the age of seventeen he went to sea, but he discontinued his sailor life after a few voyages, and became successively a clock maker, a brassfounder, and a silversmith. During the rebellion he followed the trade of sutler to the American troops, and amassed in that way a considerable sum of money, with which he bought land in Virginia. He was appointed deputy-surveyor for Kentucky in 1780, and when returning to Philadelphia in the following year he was captured by the Indians, but shortly afterwards regained his liberty. About this time he began an exploration of the north-western regions, with the view of preparing a map of the district; and while sailing on the great western rivers, the idea occurred to him that they might be navigated by steam. He endeavored by the sale of his map to find money for the carrying out of his projects, but was unsuccessful. He next applied for assistance to the legislatures of different States, but though each reported in favorable terms of his invention, none of them would agree to grant him any pecuniary assistance. He was successful, however, in 1786, in forming a company for the prosecution of his enterprise, and shortly afterwards a steam-packet of his invention was launched on the Delaware. His claim to be the inventor of steam-navigation was disputed by James Rumsey of Virgia, but Fitch obtained exclusive rights in steam-navigation in New Jersey, Pennsylvania, and Delaware, while a similar privilege was granted to Rumsey in Virginia, Maryland, and New York. A steam-boat built by Fitch conveyed passengers for hire on the Delaware in the summer of 1790, but the undertaking was a losing one, and led to the dissolution of the company. In 1793 he endeavored to introduce his invention into France, but met with no success. On his return to America he found his property overrun by squatters, and reaping from his invention nothing but disappointment and poverty, he committed suicide in 1798. He left behind him a record of his adventures and misfortunes, "inscribed to his children and future posterity;" and from this a biography was compiled by Thompson Westcott (Philadelphia, 1857).

FITCH, Ralph, a London merchant and one of the earliest English travellers in India, lived in the latter half of the 16th century. As he was engaged in a traffic in Eastern products it occurred to him that he might pursue a more profitable trade were he to visit the countries from which they came. Accordingly, along with four other merchants, he re-embarked in January, 1583, in a ship called the "Tygre," and set sail for Tripoli in Syria. From Tripoli they journeyed to Aleppo and through Mesopotamia to Baghdad, from whence they sailed down the Tigris to Bussorah. From Bussorah they sailed in small boats down the Persian Gulf to the island of Ormus. Here from the jealousy of the other European merchants at their success, they were apprehended by the governor of the castle as spies and sent to the Portuguese viceroy at Goa. They afterwards received their liberty on paying a fine, but fearing a second imprisonment they escaped secretly from Goa, and journeyed through the interior of India. Fitch ultimately left his companions, and after reaching Bengal he sailed in 1589 for Cochin, touching on his way at Ceylon. After sojourning at Cochin eight months he re-embarked for Goa, and thence retraced his footsteps to Tripoli, finally reaching London on the 29th April, 1591. *The voyage of Mr. Ralph Fitch, Merchant of London, to Ormus and so to Goa, in the East India; to Cambaia, Ganges, Bengala; to Bacola and Chonderi; to Pegu, to Jamahay in the kingdom of Siam, and back to Pegu, and from thence to Malacca, Zeilan, Cochin, and all the Coast of the East Indies*, is included in Pinkerton's *Collection of Travels*.

FITCHBURG, a city of the United States, one of the capitals of Worcester county, Massachusetts, is situated on a branch of the Nashua river, 40 miles W.N.W. of Boston. It includes the villages of Crockerville, Rockville, South Fitchburg, Traskville, and West Fitchburg. It is the terminus of four railways—to Boston, Worcester, Brattleboro', and Keene and Bellows Falls. The principal buildings are the masonic hall, the city hall, the jail, the court-house, and the high school. It has woollen, cotton, and paper mills, machine shops, chair manufactories, iron foundries, and brass foundries. Fitchburg was originally included under Lunenburg. It was incorporated as a separate town in 1764, and became a city in 1872. The population in 1860 was 7805, and in 1870 it amounted to 11,260, 2517 being foreigners.

FITZGERALD, Lord Edward (1763–1798), one of the leaders of the Society of United Irishmen, was a younger son of the first duke of Leinster, and was born at Carton Castle, near Dublin, October 15, 1763. At ten years of age he lost his father, and, his mother marrying again, the family soon after settled in France. Lord Edward was carefully educated by his stepfather, Mr. Ogilvie, chiefly with a view to the profession of a soldier. Returning to England in 1779 he entered the English army, and in 1781 he sailed with his regiment for America, where he soon obtained the appointment of aide-de-camp on the staff of Lord Rawdon. He served in the war with no little reputation for personal courage, readiness of resource, and humane feeling. He was severely wounded at the battle of Eutaw Springs. After the surrender of York Town he joined the staff of General O'Harra at St. Lucia, and the same year (1783) returned to Ireland. He was soon returned as member for Athy to the Irish parliament; but the high hopes which he had cherished of serving his country faded away at the spectacle of political corruption and suppression of all genuine representation by the penal laws against Roman Catholics. In 1787 he set out for a visit to the south of Europe, went afterwards to America, and in 1790 returned to England, and soon resumed his seat in the Irish parliament. The French Revolution had broken out, and Lord Edward was one of those ardent spirits that welcomed with enthusiasm the promise of its first days. In 1792 he was attracted to Paris, and made the acquaintance of the most famous leaders of the Revolution. Having publicly renounced his title of nobility and avowed his sympathy with the republicans, he was dismissed, with other officers, from the English army. It was during this visit to Paris that he was introduced to the lady then known as "Pamela," the daughter of Madame de Genlis, by the duke of Orleans ("Égalité"). In December, 1792, they were married at Tournay, and returned to Ireland in January, 1793. After a period of singular happiness spent in a country home, his sympathies with the struggles of his countrymen led him out to the troubled arena of politics. He joined in 1796 the society of United Irishmen, was sent to France to negotiate a treaty with the Directory for a French invasion of Ireland, and urged on with the utmost zeal the preparations for an Irish insurrection. But the scheme was betrayed, several of the leaders were arrested, and Fitzgerald concealed himself in a house at Dublin, still continuing to direct the movement. A price was set on his head, the place of his retreat was discovered, and after a severe struggle he was captured by police officers (May 19, 1798), and committed to prison. There he died on the 4th of June, of the wounds which he had received; a bill of attainder was immediately passed against him, and his estates were confiscated; but the attainder was at a later time reversed. His widow married Mr. Pitcairn, American consul at Hamburg; but the union was an unhappy one, and ended in a separation by mutual consent. Lady Fitzgerald henceforward lived in retirement at Montauban till 1830, when she removed to Paris, Louis Philippe, the associate of her childhood, having become king of the French. He, however, refused to see her, and she died poor in 1831. An interesting narrative of *The Life and Death of Lord Edward Fitzgerald*, by Thomas Moore, was published in 1831, in 2 vols. 8vo. A cheap reprint in 1 vol. was issued in 1875.

FITZGERALD, Lord Thomas (d. 1536), was vice-deputy of Ireland for his father, Gerald, ninth earl of Kildare, in the reign of Henry VIII. He appears to have accompanied his father to London early in 1534, on occasion of the third summons of the earl to answer grave charges of maladministration as lord deputy. But after the earl's committal to the Tower he was sent back to Ireland to take the place of vice-deputy in his father's absence, with secret instructions to raise a rebellion against the English Government. He was at this time hardly of age, and his amiable manners and accomplishments had procured for him the appellation of "Silken Thomas." He was, however, of a high spirit and fiery temper, and fiercely resented the English rule. As soon as he arrived in Ireland, he cleared the way by formally surrendering his office and the sword of state, and then openly proclaimed a rebellion. He obtained possession of Dublin city before the end of July, and formed the siege of the castle, into which the English governor had withdrawn. Archbishop Allen, the primate who had been appointed by Henry VIII. to keep watch over Kildare and to report his proceedings, sought safety in flight and sailed for England. But the ship was run aground, and the archbishop was seized by the young Lord Thomas and massacred in his presence with his English chaplains and attendants. This murder was reported by a special messenger from Fitzgerald to the pope and the emperor, the former being asked for absolution if necessary, and the latter for assistance. Sentence of excommunication was pronounced on Fitzgerald for this murder of the archbishop. In August, Fitzgerald was forced to relinquish the siege of Dublin Castle, and hasten to defend or recover his own domains which the earl of Ormond had invaded. He tried in vain to seduce Ormond from his allegiance, but obtained a truce, of which he took treacherous advantage to attack him. He then again besieged Dublin, which had closed its gates against him. On October 14, in consequence of Ormond's renewed invasion of Kildare, he was compelled to raise the siege. Three days later the English army landed at Dublin, and was enthusiastically welcomed. Fitzgerald withdrew into the country; but, taking advantage of the inactivity of Skeffington, the new deputy, he approached Dublin again and burnt two villages near the city (November). The old earl had been attainted, and he died in the Tower soon after hearing of his son's rebellion and excommunication. The deathblow to the rebellion was at length given by Skeffington, who in March, 1535, stormed the castle of Maynooth, the chief stronghold of the "Geraldines." Lord Thomas, who had now succeeded his father, but did not assume the title, retreated into Thomond, intending to sail for Spain and plead with the emperor. This scheme he relinquished, and after leading a wandering life for some months, with a price set upon his head, he surrendered without definite conditions to Lord Leonard Grey (August), and was at once conducted by him to England. He was committed to the Tower with his five uncles; and the six Geraldines were hung at Tyburn as traitors (February 3, 1536). An act of attainder was passed against the earl of Kildare, Lord Thomas, and others, in 1537; but the family estates were restored by Edward VI., and the attainder was repealed by Queen Elizabeth. Moore has pointed out, in his *Life and Death of Lord Edward Fitzgerald*, some remarkable points of resemblance between his story and that of his ancestor, Lord Thomas.

FITZHERBERT, Sir Anthony, an eminent English lawyer, was born at Norbury. After studying at Oxford, he was called to the English bar, and in 1523 became justice of the court of common pleas, the duties of which office he continued to discharge till within a short time of his death in 1538. As a judge he left behind him a high reputation for fairness and integrity, and his legal learning is sufficiently attested by his published works.

He is the author of *Le graunde abridgement*, a digest of important legal cases written in Old French, first printed in 1524; *The Office and Authority of Justices of the Peace*, first printed in 1538, last ed. 1794; the *New Natura Brevium*, 1534, last ed. 1794, with a commentary ascribed to Sir Matthew Hale; and the *Book of Husbandry*, 1523, the first published work on agriculture in the English language.

FITZROY, Robert (1805–1865), a vice-admiral in the English navy, distinguished as a hydrographer and meteorologist, was born at Ampton Hall, Suffolk, July 5, 1805, being a grandson, on the father's side, of the third duke of Grafton, and on the mother's, of the first marquis of Londonderry. He entered the navy from the Royal Naval College, then a school for cadets, on the 19th October, 1819, and on the 7th September, 1824, was promoted to the rank of lieutenant. After serving in the "Thetis" frigate in the Mediterranean and on the coast of South America, under the command of Sir John Phillimore and Captain Bingham, he was in August, 1828, appointed to the "Ganges," as flag-lieutenant to Rear-Admiral Sir Robert Otway, the commander-in-chief on the South American station; and on the melancholy death of Commander Stokes of the "Beagle," 13th November, 1828, was promoted to the vacant command. The "Beagle," a small brig of about 240 tons, was then, and had been for the two previous years, employed on the survey of the coasts of Patagonia and Tierra del Fuego, under the orders of Commander King in the "Adventure," and, together with the "Adventure," returned to England in the autumn of 1830. Fitzroy had brought home with him four Fuegians, one of whom died of small-pox a few weeks after arriving in England; to the others he endeavored, with but slight success, to impart a rudimentary knowledge of religion and of some useful handicrafts; and, as he had pledged himself to restore them to their native country, he was making preparations in the summer of the following year to carry them back in a merchant ship bound to Valparaiso, when he received his reappointment to the "Beagle," to continue the survey of the same wild coasts. The "Beagle" sailed from Plymouth on the 27th December, 1831, carrying as a supernumerary Mr. Charles Darwin, to whose experience, then gained, the study of natural history has been so deeply indebted. After an absence of nearly five years, and having, in addition to the survey of the Straits of Magellan and a great part of the coast of South America, run a chronometric line round the world, thus fixing the longitude of many secondary meridians with sufficient exactness for all the purposes of ordinary navigation, the "Beagle" anchored at Falmouth on the 2d October, 1836. In 1834 Fitzroy had been advanced to the rank of captain, and was now for the next few years principally employed in reducing and discussing his numerous observations. In 1837 he was awarded the gold medal of the Royal Geographical Society; and in 1839 he published, in two thick 8vo volumes, the narrative of the voyage of the "Adventure" and "Beagle," 1826–30, and of the "Beagle," 1831–36, with a third volume by Mr. Darwin—a book familiarly known as a record of scientific travel. Of Fitzroy's work as a surveyor it is superfluous to speak. Though carried on under circumstances of great difficulty, with scanty means, and with an outfit that was semi-officially denounced as "shabby," the results have long been before the world stamped with the approval of the nautical profession, and more especially of Sir Francis Beaufort, the Hydrographer to the Admiralty, who, in a report to the House of Commons, 10th February, 1848, wrote that "from the equator to Cape Horn, and from thence round to the river Plata on the eastern side of America, all that is *immediately*[1] wanted has been already achieved by the splendid survey of Captain Robert Fitzroy."

In 1841 Fitzroy unsuccessfully contested the borough of Ipswich, and in the following year was returned to parliament as member for Durham. About the same time he accepted the post of conservator of the Mersey, and in his double capacity obtained leave to bring in a bill for improving the condition and efficiency of officers in the mercantile marine. This was not proceeded with at the time, but gave rise to the "voluntary certificate" instituted by the Board of Trade in 1845, and furnished some important clauses to the Mercantile Marine Act of 1850.

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[1] This was written 30 years ago, before steam ships nearly 400 feet long made the Straits of Magellan a high road to the Pacific. The survey that was sufficient then is very far from sufficient now.

Early in 1843 Fitzroy was appointed governor and commander-in-chief of New Zealand, then recently established as a colony. He arrived in his government in December, whilst the excitement about the Wairau massacre was still fresh, and the questions relating to the purchase of land from the natives were in a very unsatisfactory state. The early settlers were greedy and unscrupulous; Fitzroy, on the other hand, had made no secret of his partiality for the aborigines. Between such discordant elements agreement was impossible: the settlers insulted the governor; the governor did not conciliate the settlers, who denounced his policy as adverse to their interests, as unjust and illegal; colonial feeling against him ran very high; petition after petition for his recall was sent home, and the Government was compelled to yield to the pressure brought to bear on it. Fitzroy was relieved by Sir George Grey in November, 1845.

In September, 1848, he was appointed acting superintendent of the dockyard at Woolwich, and in the following March to the command of the "Arrogant," one of the early screw frigates which had been fitted out under his supervision, and with which it was desired to carry out a series of experiments and trials. When these were finished he applied to be superseded, on account at once of his health and of his private affairs. In February, 1850, he was accordingly placed on half-pay; nor did he ever serve again, although advanced in due course by seniority to the ranks of rear and vice-admiral on the retired list (1857, 1863). In 1851 he was elected a fellow of the Royal Society, and in 1854 after serving for a few months as private secretary to his uncle, Lord Hardinge, the commander-in-chief of the army, he was appointed to the meteorological department of the Board of Trade, with, in the first instance, the peculiar title of "Meteorological Statist."

From the date of his joining the "Beagle" in 1828 he had paid very great attention to the different phenomena foreboding or accompanying change of weather, and his narratives of the voyages of the "Adventure" and "Beagle" are full of interesting and valuable details concerning these. Accordingly, when in 1854 Lord Wrottesley, the president of the Royal Society, was asked by the Board of Trade to recommend a chief for its newly forming meteorological department, he, almost without hesitation, nominated Fitzroy, whose name and career became from that time identified with the progress of practical meteorology. His *Weather Book*, published in 1863, embodies in broad outline his views, far in advance of those then generally held; and though, in the rapid march of modern science, this book must be considered as now in some measure obsolete, it is still worthy of careful attention and exact study, not only from the professed meteorologist, but from any one who wishes to have an intelligent appreciation of that question of everyday interest, the weather. His storm warnings, in their origin, indeed, liable to a charge of empiricism, were gradually developed on a more scientific basis, and gave a high percentage of correct results. They were continued for eighteen months after his death by the assistants he had trained, and though stopped when the department was transferred to the management of a committee of the Royal Society, they were resumed a few months afterwards. But though it is perhaps by these storm warnings that Fitzroy's name has been most generally known, seafaring men owe him a deeper debt of gratitude, not only for his labors in reducing to a more practical form the somewhat complicated wind charts of Captain Maury, but also for his great exertions in connection with the life-boat association. Into this work, in its many ramifications, he threw himself with the energy of an excitable temperament, already, it may be feared, strained by his long and anxious service in the Straits of Magellan. His last years were fully and to an excessive degree occupied by it; his health, both bodily and mental, threatened to give way; but he refused to take the rest that was prescribed. In a fit of mental aberration he put an end to his existence on the 30th April, 1865.

Besides his works already named mention may be made of *Remarks on New Zealand* (1846); *Sailing Directions for South America* (1848); his official reports to the Board of Trade (1857–65); and occasional papers in the journal of the Royal Geographical Society and of the Royal United Service Institution. (J. K. L.)

FITZSTEPHEN, William, an English historian, was a native of London, and died in 1191. Becoming a monk of Canterbury, he had very confidential relations with Thomas à Becket. Shortly after the death of Thomas he wrote his life in Latin, a work which bears internal evidence of greater impartiality and truthfulness than most of the archbishop's biographies, and is besides of interest as containing a long description of the city of London. There is a manuscript copy of the work in the British Museum.

A translation of the description of London was inserted by Stowe in his *Survey of London*, and in 1772 Dr. Pegge published a new and more correct edition, in Latin and English, accompanied with notes and an essay on the author. A corrected version, with a translation, was also inserted in the edition of Stowe's *Survey* published in 1843.

FIUME (Slav. Rieka, German St. Veit-am-Flaum), a royal free town and port of Hungary situated at the northern extremity of the Gulf of Quarnero, on the Recina (Fiumara), 46 miles by road S.E. of Trieste, 45° 19′ 19″ N. lat., 14° 26′ 43″ E. long. It consists of an old and a new town, the former standing on a hill, the latter extending along the shore. The population in 1869 amounted to 14,039 for the town, and 4770 for the territory of Fiume: of these the greatest number were Roman Catholics. Among the many important buildings are the old chapter or cathedral church of the Assumption of the Virgin, and the church of St. Veit, built in imitation of Sta. Maria della Salute at Venice, the theatre, capable of holding 1600 persons, the palace of Gorup, the barracks, and the elegant marine academy founded in 1856. In the old town is an ancient Roman triumphal arch, said to have been erected in honor of the emperor Claudius II. Fiume possesses several educational establishments, among which are a real-gymnasium, two municipal high schools, and a Croatian gymnasium. The consuls of several states reside in the town, which is the seat of a high court of justice for commerce and marine, and of a chamber of industry and commerce. Among the benevolent institutions are asylums for lunatics and decayed citizens, and an industrial home for boys. Notwithstanding the revival of trade at Trieste, commercial enterprise and industry have considerably increased at Fiume, and the town has now two railways, opened in 1873—one a branch of the southern railway from Vienna to Trieste, the other of the Hungarian state railway from Carlstadt. Fiume is the immediate outlet by sea for the produce of Hungary, with which country it is connected by the Louisen-strasse, opened in 1809. It has two harbors —Porto Canale Fiumara, suitable only for coasting-vessels and small craft, and Porto Nuovo, affording good accommodation for large ships. The latter port, commenced in 1847, is now (1878) being much enlarged and extended to meet the increasing requirements of trade, and when completed will occupy an area of 57½ acres, and afford quay accommodation for 100 large vessels. The chief exports are wheat, wine, tobacco, timber, rags, salt, rape-seed, hemp, and paper, of which last the annual exports amount to upwards of 30,000 cwt. Foremost among the industrial establishments are Whitehead's torpedo factory, Messrs. Smith & Meynie's paper-mill, the royal tobacco factory (furnishing yearly more than 200 million cigars and cigarettes, and employing above 3000 hands), a chemical factory where 1600 tons of sulphate of soda are annually made, and a large steam flour-mill. Besides these may be mentioned several shipbuilding yards, tanneries, and rope manufactories. The soil of the surrounding country is stony, but the climate is warm, and wine is extensively produced. The Gulf of Quarnero yields a plentiful supply of fish, and the tunny trade with Trieste and Venice is of considerable importance.

Fiume is supposed to occupy the site of the ancient Liburnian town *Tersatica*; later it received the name of Vitopolis, and eventually that of Fanum Sancti Viti ad Flumen, from which its present name is derived. It was destroyed by Charlemagne in 799, from which time it probably long remained under the dominion of the Franks. It was held in feudal tenure from the patriarch of Aquileia by the bishop of Pola, and afterwards, in 1139, by the counts of Duino, who retained it till the end of the fourteenth century. It next passed into the hands of the counts of Wallsee, by whom it was surrendered in 1471 to the emperor Frederick III., who incorporated it with the dominions of the house of Austria. From this date till 1776 Fiume was ruled by imperial governors. In 1723 it was declared a free port by Charles VI., in 1776 united to Croatia by the empress Maria Theresa, and in 1779 declared a *corpus separatum* of the Hungarian crown. In 1809 Fiume was occupied by the French; but it was retaken by the English in 1813, and restored to Austria in the following year. It was ceded to Hungary in 1822, but after the revolution of 1848–49 was annexed to the crown lands of Croatia, under the government of which it remained for the next twenty years. Since August, 1870, the town and territory of Fiume have been under the direct control of the Hungarian central Government.

See "Fiume and her New Port," by G. L. Faber, H.B.M. Vice-Consul at Fiume, in *Jour. of the Soc. of Arts*, Nov., 1877.

FIVES is a game which has existed in various forms from the earliest times. The name is derived from the essential feature of the pastime, consisting in striking a ball with the five digits of the human hand, the idea of there sometimes having been five players on each side requiring confirmation. Amongst the Greeks the *ἀπόῤῥαξις* was somewhat akin, since a ball was struck with the hand as many successive times as possible at each rebound from the ground. Of the method of playing the Roman *pila* we possess no details. Horace (*Sat.*, i. 5, 48) speaks of it thus:—

> Lusum it Mæcenas, dormitum ego Virgiliusque;
> Namque pila lippis inimicum et ludere crudis.

Judging from these lines the ball play of that day must have been both fatiguing and dangerous. In the *Close Roll*, 39 Edward III. (1365) mem. 23, *pila manualis* is mentioned as one of those pastimes which had caused the recent deterioration of archery, and some description of fives is no doubt referred to. During the 15th century palm play in England and *jeu de paume* in France were the chief analogous pastimes. In recent times our great public schools and universities have become the sole nurseries of fives. In the "open" court the only desiderata are a level piece of ground with a smooth wall in front against which the ball is struck. A "close" court has in addition two side-walls at right angles to the front one, and the whole may or may not be covered in. The invariable principle is to strike the ball, not later than at its first rebound from the ground, against the front wall and above a certain line as many consecutive times as possible. A single game comprises one player a side, a double one two. The minor rules vary at most schools and universities, and are generally handed down by tradition. About two inches is the usual diameter of the ball, the core being made of india-rubber, bound round with fine twine, and covered with white leather.

FIVES, a town in France, department of the Nord, now administratively connected with Lille. See LILLE.

FIX, THEODORE (1800–1846), a French journalist and political economist, was born at Soleure in Switzerland in 1800. His father was a French physician who had been expatriated by the edict of Nantes. Young Fix adopted at first the profession of a land surveyor, but, tiring of the monotony of this employment, he in 1830 became connected with the *Bulletin Universel des Sciences*, to which he contributed most of the geographical articles. In 1833 he founded the *Revue mensuelle d'Économie Politique*, which he continued till 1836. He also contributed to *Le Siècle*, *La Quotidienne*, *Le Journal des Économistes*, and *La Revue Nouvelle*. An article of his in the August number of the *Revue Nouvelle* for 1846, on the religious condition of Germany, attracted considerable attention. His principal work is *Observations sur les Classes Ouvrières*, 1846, in which he argues against all attempts to regulate artificially the rate of wages. His pamphlet on *L'Association des Douanes Allemandes* was in 1840 crowned by the Academy of Sciences, but has not been published. He died suddenly at Paris, 31st July, 1846.

FIXTURES, in law, may be defined as things which have been fixed or attached to land, or, as it is expressed in English law, things annexed to the freehold. All systems of law make a marked distinction between immovables and movables, between real and personal property, between land and all other things. In the case of fixtures the question arises under which set of rights they are to fall—under those of real or of personal property. The general rule of English law is that everything attached to the land goes with the land—*quidquid plantatur solo, solo cedit.* This, like many other rules of English law, is all in favor of the freeholder; and its injustice has been modified by a large number of exceptions formulated from time to time by the courts as occasion arose.

As to the kind of "fixing" necessary to change the legal character of the thing fixed, it would not be easy to lay down any precise rule. Things merely resting on the ground by the force of their own weight, removable easily and without damage to the soil, and intended not for the improvement of the inheritance but for temporary use, would not be regarded as fixtures. On the other hand, there is what is called constructive annexation, when the articles in question are not in any sense fixed at all, but pass with the freehold as if they were, *e.g.*, the keys of a house, heirlooms, etc.

Questions as to the property in fixtures may arise—(1) between landlord and tenant, (2) between heir and executor, (3) between executor and remainder-man or reversioner. These are the principal cases.

(1.) As a general rule, if the tenant has affixed anything to the freehold during his occupation, he cannot remove it without the permission of his landlord. But an exception was established in favor of *trade fixtures.* In a case before Lord Holt it was held that a soap-boiler might, *during his term*, remove the vats he had set up for trade purpose, and that not by virtue of any special custom, but "by the common law in favor of trade, and to encourage industry." Agriculture is not a trade within the meaning of this exception, and fixtures erected by a farmer for the purposes of agriculture may not be removed without the landlord's consent. On the other hand, nurserymen and gardeners, whose industry closely resembles agriculture, are allowed to remove trees, shrubs, etc., planted by them with a view to sale. It seems probable that the introduction of more elaborate mechanical processes in agriculture—particularly the use of steam-power—may have the effect of modifying the law as to agricultural fixtures. The statute 14 and 15 Vict. c. 25 enacts that, when a tenant-farmer has, with the written consent of his landlord, erected buildings, machinery, etc., for agricultural or trade purposes, the same shall be his property, and removable by him, after giving notice to the landlord, who may, however, elect to purchase them.

Again, *ornamental* fixtures, such as hangings and looking-glasses, tapestry, iron-backs to chimneys, wainscot fixed by screws, marble chimney-pieces, are held to belong to the tenant, and to be removable without the landlord's consent. Here again the extent of the privilege is a matter of some uncertainty. In one case it was held that the privilege did not extend to a conservatory erected on a brick foundation 15 inches deep, and connected with other buildings. Mr. Amos, in his book on fixtures, mentions four points which would be important in settling whether an ornamental fixture is removable or not:—(1) the mode in which it is united with the freehold; (2) its nature and construction, whether meant to be a temporary or permanent improvement; (3) whether it can be easily removed without injury to the freehold; (4) whether there is any local usage.

In all these cases the fixtures must be removed during the term. If the tenant gives up possession of the premises without removing the fixtures, it will be presumed, it appears, that he has made a gift of them to the landlord, and that presumption probably could not be rebutted by positive evidence of a contrary intention. His right to the fixtures is not, however, destroyed by the mere expiry of the term, if he still remains in possession; but if he has once left the premises, he cannot come back and claim his fixtures. In one case where the fixtures had actually been severed from the freehold after the end of the term, it was held that the tenant had no right to recover them.

(2.) As between heir and executor or administrator. The question of fixtures arises between these parties on the death of a person owning land. His real property goes to his heir; his personal property goes to his executor. In this case exceptions introduced in favor of the tenant are not allowed in favor of the executor, for, as it is said, the "heir is a favorite of the law." There is some conflict of authorities on this point, and cases might be cited on both sides of the question, whether the executor as against the heir has a right to ornamental or even to trade fixtures. Thus in one case a cider-mill let into the ground was held to belong to the executor; in another (a Scotch case before the House of Lords) colliery machinery was awarded to the heir, although portions of it might have been detached without any injury to the land. Blackstone lays down the rule that whatever is strongly affixed to the freehold (*quod ex ædibus non facile revellitur*) passes to the heir.

(3.) When a tenant for life of land dies the question of fixtures arises between his representatives and the persons next entitled to the estate (the remainder-man or reversioner) The remainder-man is not so great a favorite of the law as the heir, and the right to fixtures is construed more favorably for executors than in the preceding cases between heir and executor. Whatever is executor's fixtures against the heir would therefore be executor's fixtures against the remainder-man. And the result of the cases seems to be that, as against the remainder, the executor of the tenant for life would be certainly entitled to trade fixtures.

Similar questions may arise in other cases, *e.g.*, as between mortgagor and mortgagee. When land is conveyed the fixtures pass with it, unless a contrary intention is expressed in the conveyance. Again, in reference to bills of sale the question arises. Bills of sale are dispositions of personal property similar to mortgages, the possession remaining with the person selling them. To make them valid they must be registered. and so the question has arisen whether deeds conveying fixtures ought not to have been registered as bills of sale. Unless it was the intention of the parties to make the fixtures a distinct security, it seems a deed of mortgage embracing them does not require to be registered as a bill of sale.

FLACCUS, Caius Valerius, a Roman poet of the first century of the empire, of whose personal history little or nothing is known. He has been identified, but on wholly insufficient grounds, with the Flaccus, a poet friend of Martial, to whom the 77th epigram of the 1st book is addressed, and hence described as a native of Padua, and in needy circumstances. In the subscription of the Vatican MS. the names *Setinus Balbus* are appended, whence it is probable that he was born at Setia in Campania. The sole notice of him found in classical authors is a short sentence of Quintilian (*Inst.*, x. 1, 90), "Multum in Valerio Flacco nuper amisimus," whence we gather that he must have died before 90 A. D., though it does not follow, as is commonly stated, that he was cut off by an untimely death. If we turn for information to his only known work, the *Argonautica*, we learn from the dedication, which is addressed to Vespasian, that it was written during the siege or shortly after the fall of Jerusalem, 70 A. D. The *Argonautica* is an epic on the quest of the golden fleece. The poem is unfinished, the eighth book terminating abruptly with the request of Medea to accompany Jason on his homeward voyage. It is a free imitation and in parts a translation of the work of Apollonius of Rhodes, which had already been made familiar to the Romans by the popular version of Varro Atacinus. Various estimates have been formed of the genius of Flaccus, and some competent critics, such as Scaliger, Heinsius, and Weichart, have ranked him above his original. His diction is pure, his style correct, his versification smooth though monotonous, and he has some descriptive power, as is shown in the storm of the eighth book, and the picture of the dragon lulled to sleep by Medea's charms. On the other hand, he is wholly without originality, and his poetry reads as if made to order. It is free from glaring defects, but is rendered all but worthless by its monotony, artificiality, and elaborate dulness. He deserves, no less than Silius Italicus, to be called the ape of Virgil. One instance will suffice to show how he has vulgarized the great poet. The desertion of Hypsipyle by Jason in the second book is closely modelled on the desertion of Dido by Æneas, but instead of "Si quis mihi parvulus aula luderet Æneas," we have "Per hunc utero quem linquis Iasona nostro;" instead of "Quem sese ore gerens," etc., "Tales humeros ea terga relinquit." The corruptions of the text, and the obscurity of the mythological and geographical allusions, have attracted commentators and critics, but few except professed scholars will care to read a second-rate copy of a second-rate poet.

Bibliography.—The *Argonautica* was unknown till the first three books and half of the fourth were discovered by Poggio at St. Gall when attending the council of Constance. The *editio princeps* was published at Bologna, 1474, from the Vatican MS. 3277. Among other editions we may mention Burman's *Variorum*, Leyden, 1724; J. A. Wagner's, Göttingen, 1805; G. Thilo's, Halle, 1863 (the first careful collation of the Vatican MS.): C. Schenkl's, Berlin, 1871; and the 8th book annotated by A. Weichert, Meissen, 1817. There are translations into French prose by J.-J. A. Caussin de Perceval in the *Bibliothèque Latine-Française;* into French verse by Dureau de la Malle, Paris, 1811; and into Spanish verse by D. J. de Leon Bendicho y Quilty, Madrid, 1868; into Italian by Pindemonte, Verona, 1776; into German by Wunderlich, Erfurt, 1805. Warton speaks doubtfully of an English version: "We seem to have had a version of Valerius Flaccus in 1565; for, in that year. I know not if in verse or prose, was entered to Purfoote 'The story of Jason, how he gotte the golden flece, and how he did begyle Media, out of Latin into Englische, by Nycholas Whyte.'" The book is not recorded by Watt, nor is it in the British Museum.

FLACIUS (in German Vlacich), Matthias, surnamed Illyricus (1520–1575), a celebrated German theologian of the time of the Reformation, was born at Albona in Illyria in 1520. Having lost his father in early childhood, he owed his education almost wholly to his own unaided perseverance. At the age of seventeen he had resolved to enter a convent in order to devote his life to sacred learning; but on the advice of one of his relations, who had imbibed Reformation principles, he abandoned his intention, and pursued his studies successively at Basel, Tübingen, and Wittenberg. At Wittenberg he fell for a time into religious despondency, and sought the advice of Martin Luther, who was successful not only in removing his doubts, but in inspiring him with much of his own R formation zeal. In 1544 he became professor of Old Testament literature at Wittenberg, and soon began to take an active and prominent part in the theological discussions of the time. He strenuously opposed the Augsburg Interim and also the compromise of Melanchthon, known as the Leipsic Interim, and was compelled on that account to resign his professorship. From Wittenberg he proceeded to Magdeburg, and in 1557 he was appointed professor of theology at Jena, but soon became involved in a controversy with his colleague Strigel on the power of the human will in conversion. Being a strong upholder of the doctrine of man's natural inability, he was induced by controversial straits to fall unwittingly into the Manichæan heresy of affirming that original sin was not an accident in human nature, but now belonged to its substance; and as he would not submit to ecclesiastical censure, he was compelled in 1562 to resign his office. After staying for five years in retirement at Ratisbon, he accepted the charge of a congregation in Antwerp, but was soon compelled by religious persecution to leave that city for Strasburg. Here his views regarding original sin again exposed him to ecclesiastical censure, and he went to Frankfort-on-the-Maine, in the hospital of which city he died in 1575, having spent the latter years of his life in great poverty. Though the keen and uncompromising controversial spirit of Flacius ultimately deprived him of the sympathy of almost all his friends, he is better known to posterity for his labors in hermeneutics and church history than as a controversialist. He may almost be called the founder of the science of hermeneutics, and in the department of church history he rendered important service by tracing to their source the legends and superstitious traditions by which, in the annals of the church, truth had in a great measure been either concealed or superseded. Among his numerous works may be mentioned his *Clavis Scripturæ Sacræ*, and the *Catalogus Testium Veritatis*, which he contributed to the *Magdeburg Centuries.*

See Ritter, *Flacius's Leben und Tod*, Frankfort, 1725; Twesten, *Matth. Flacius Illyricus*, Berlin, 1844; Preger, *Matth. Flacius Illyricus und seine Zeit*, 2 vols. Erlangen, 1859–61; and *Mattia Flacio Istriano di Albone, notizie e documenti*, Pola, 1869.

FLACOURT, Étienne de (1607–1660), a French governor of Madagascar, was born at Orleans in 1607. When he was named governor of Madagascar by the East India Company in 1648, the French troops had mutinied against the former governor, and a large number of them had also been massacred by the natives. Flacourt soon restored order among the soldiers, but in his dealings with the natives he was less successful, and their intrigues and attacks kept him in continual harassment during all his term of office. As he was in uncertainty regarding the affairs of the company, he returned in 1655 to France. Not long after he was appointed director general of the company; but, having again returned to Madagascar, he

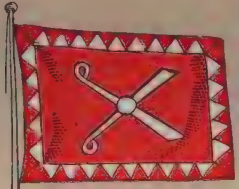
AUSTRIAN STANDARD

ITALY

PAPAL STANDARD

GREEK ENSIGN

TURKEY



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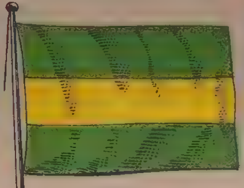

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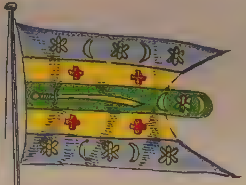

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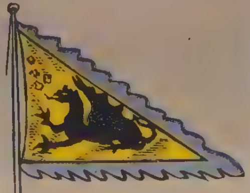

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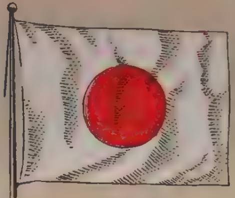

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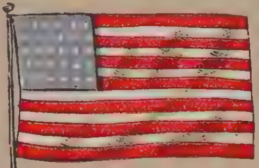

AMERICAN FLAG
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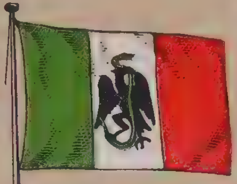

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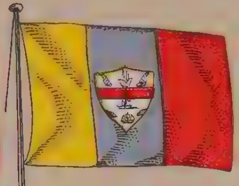

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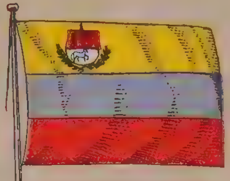

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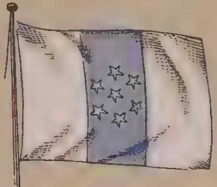

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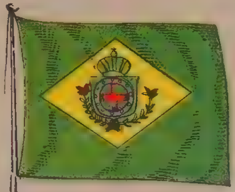

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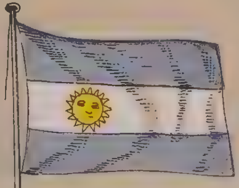

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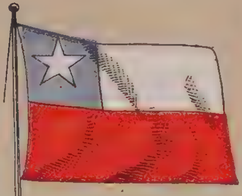

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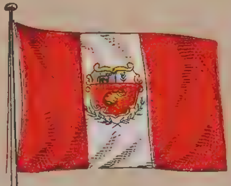

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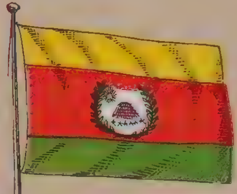
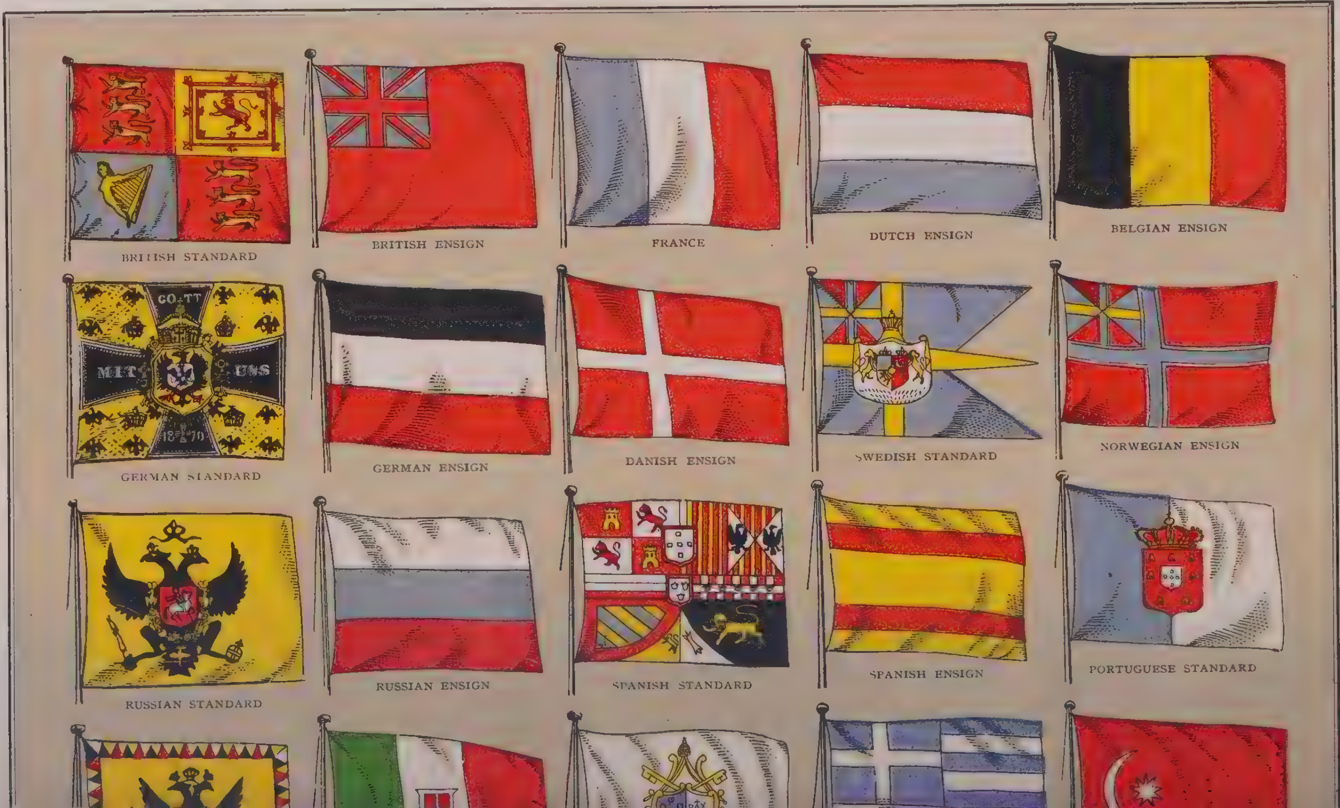


BOLIVIA

VOL. IX. FLAG. PLATE I.



was drowned on his voyage home, 10th June, 1660. Several unknown districts of Madagascar and some small islands in its neighborhood were explored by the orders of Flacourt, and he also in 1649 took possession of the island of Mascareigne, which he named Bourbon. He is the author of a *Histoire de la grande isle Madagascar* (1st edition 1658, 2d edition 1661), which is divided into two parts,—the first containing an account of the island, its inhabitants, and its natural history, and the second detailing the history of the events connected with its occupation by the French. Of this work the only portion of much value is the natural history section, which gives evidence of a considerable amount of minute and careful observation. He published also in 1658 a dictionary of the language of the island, which, however, is very incomplete and full of mistakes.

Plate I.

FLAG. It is probable that almost as soon as men began to collect together for common purposes some kind of conspicuous object was used, as the symbol of the common sentiment, as the rallying point of the common force. In military expeditions where any degree of organization and discipline prevailed, objects of such a kind would be necessary to mark out the lines and stations of encampment, and to keep in order the different bands when marching or in battle. And, in addition to all this, it cannot be doubted that flags or their equivalents have often served, by reminding men of past resolves, past deeds, past heroes, to rally to enthusiasm those sentiments of *esprit de corps*, of family pride and honor, of personal devotion, patriotism, or religion, upon which, as well as upon good leadership, discipline, and numerical force, success in warfare depends.

Among the remains of that people which has left the earliest traces of civilization, the records of the forms of objects used as ensigns are frequently to be found. From their carvings and paintings, supplemented by ancient writers, it appears that the several companies of the Egyptian army had their own particular standards. These were formed of such objects as there is reason to believe were associated in the minds of the men with feelings of awe and devotion. Sacred animals, boats, emblems, or figures, a tablet bearing a king's name, fan and feather-shaped symbols, were raised on the end of a staff as standards, and the office of bearing them was looked upon as one of peculiar privilege and honor (fig. 1). Somewhat similar seem to have been the customs of the Assyrians and Jews. Among the sculptures unearthed by Layard and others at Nineveh, only two different designs have been noticed for standards; one is of a figure drawing a bow and standing on a running bull, the other of two bulls running in opposite directions (fig. 2). These, says Layard, Mr. Birch supposes may resemble the emblems of war and peace which were attached to the yoke of Darius's chariot. They are borne upon and attached to chariots, which method of bearing these objects was the custom also of the Persians, and prevailed during the Middle Ages. No representations of Egyptian or Assyrian naval standards have been found, but the sails of ships were embroidered and ornamented with devices, which was also a custom during the Middle Ages. In both Egyptian and Assyrian examples, the staff bearing the emblem is frequently ornamented immediately below with flag-like streamers. Rabbinical writers have assigned the different devices of the different Jewish tribes, but the authenticity of their testimony is extremely doubtful. Banners, standards, and ensigns are frequently mentioned in the Bible. "Every man of the children of Israel shall pitch by his standard, with the ensign of their father's house" (Num. ii. 2). "Who is she that looketh forth as the morning, fair as the moon, clear as the sun, and terrible as an army with banners?" (Cant. vi. 10). See also Num. ii. 10, x. 14; Ps. xx. 5, lx. 4; Cant. ii. 4; Is. v. 26, x. 18, lix. 19; Jer. iv. 21.

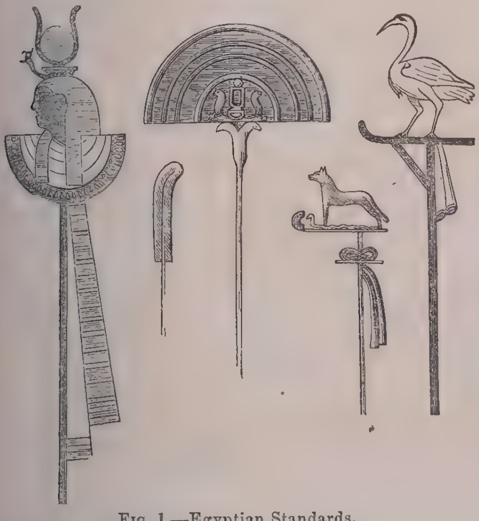


Fig. 1.—Egyptian Standards.

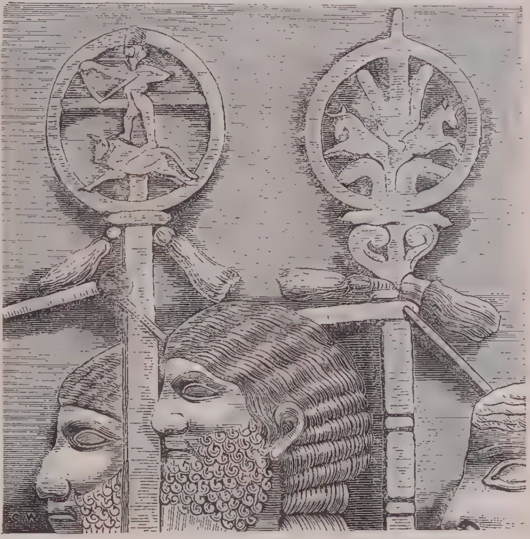


Fig. 2.—Assyrian Standards.

The Persians bore an eagle fixed to the end of a lance, and also represented the sun, as their divinity, upon their standards, which appear to have been formed of some kind of textile, and were guarded with the greatest jealousy by the bravest men of the army. The Carian soldier who slew Cyrus, the brother of Artaxerxes, was allowed the honor of carrying a golden cock at the head of the army, it being the custom of the Carians to wear that bird as a crest on their helmets. The North American Indians carried poles fledged with feathers from the wings of eagles, and similar customs seem to have prevailed among other semi-savage peoples.

The Greeks bore a piece of armor on a spear in early times; afterwards the several cities bore sacred emblems or letters chosen for their particular associations,—the Athenians the olive and the owl, the Corinthians a pegasus, the Thebans a sphinx, in memory of Œdipus, the Messenians their initial M, and the Lacedæmonians Λ. A purple dress was placed on the end of a spear as the signal to advance. The Dacians carried a standard representing a contorted serpent, while the dragon was the military sign of many peoples,—of the Chinese, Dacians, and Parthians among others,—and was probably first used by the Romans as the ensign of barbarian auxiliaries (see fig. 3).

The question of the *signa militaria* of the Romans is a wide and very important one, having direct bearing on the history of heraldry, and on the origin of national, family, and personal devices. With them the custom was reduced to system. "Each century, or at least each maniple," says Meyrick, "had its proper standard and standard-bearers." In the early days of the republic a handful of hay was borne on a pole, whence probably came the name *manipulus*. The forms of standards in later times were very various; sometimes a cross piece of wood was placed at the end of a spear and surmounted by the figure of a hand in silver, below round or oval discs, with figures of Mars or Minerva, or in later times portraits of emperors or eminent generals (fig. 3). Figures of animals, as the wolf, horse, bear, and others, were borne, and it was not until after the time of Marius that the eagle became the special standard of the legion; the *vexillum* was a square piece of cloth fastened to a piece of wood fixed crosswise to the end of a spear, somewhat resembling the mediæval *gonfalon*. The *labarum* of later emperors was similar in shape and fixing, and after Constantine bore the monogram of Christ (fig. 5, A). The Roman standards were guarded with religious veneration in the temples at Rome; and the reverence of this people for their ensigns was in proportion to their superiority to other nations in all that tends to success in war. It was not unusual for a general to order a standard to be cast into the ranks of the enemy, to add zeal to the onset of his soldiers by exciting them to recover what to them was perhaps the most sacred thing the earth possessed. The Roman soldier swore by his ensign.

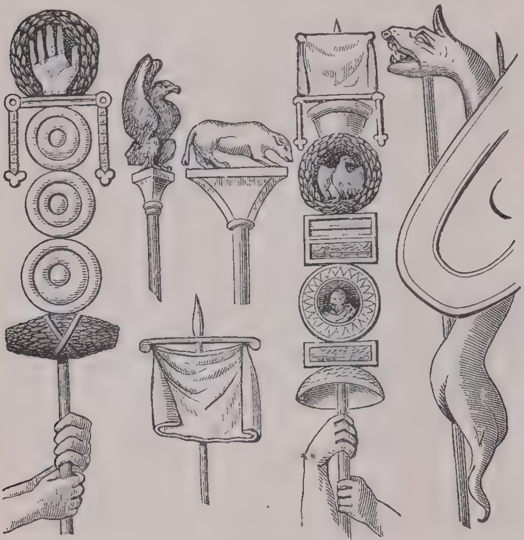


Fig. 3.—Roman Standards.

Although in earlier times drapery was occasionally used for standards, and was often appended as ornament to those of other material, it was probably not until the Middle Ages that it became the special material of military and other ensigns; and perhaps not until the practice of heraldry had attained to definite nomenclature and laws does anything appear which is in the modern sense a flag.

The Bayeux tapestry, commemorating the Norman conquest of England, contains abundant representations of the flags of the period borne upon the lances of the knights of William's army. They appear small in size, and pointed, frequently indented into three points, and bearing pales, crosses, and roundels. One, a Saxon pennon, is triangular, and roundly indented into four points; one banner is of segmental shape and rayed, and bears the figure of a bird which has been supposed to represent the raven of the war-flag of the Scandinavian vikings (fig. 4). These flags and their charges are probably not really significant of the people bearing them; for even admitting that personal devices were used at the time, the figures may have been placed without studied intention, and so give the general figure only of such flags as happened to have come under the observation of the artists. The figures are probably rather ornamental and symbolic than strictly heraldic,—that is, personal devices, for the same insignia do not appear on the shields of the several bearers. The dragon standard which he is known to have borne is placed near Harold; but similar figures appear on the shields of Norman warriors, which fact has induced a writer in the *Journal* of the Archæological Association (vol. xiii. p. 113) to suppose that, on the spears of the Saxons, they represent only trophies torn from the shields of the Normans, and that they are not ensigns at all. Standards in form much resembling these dragons appear on the arch of Titus and the Trajan column as the standards of barbarians.

At the battle of the Standard in 1138, the English standard was formed of the mast of a ship, having a silver pyx at the top, and bearing three sacred banners, dedicated severally to St. Peter, St. John of Beverley, and St. Wilfred of Ripon, the whole being fastened to a wheeled vehicle. Representations of three-pointed, cross-bearing pennons are found on seals of as early date as the Norman era, and the warriors in the first crusade bore three-pointed pennons. It is possible that the three points with the three roundels and cross, which so often appear on these banners, have some reference to the faith of the bearers in the Trinity and in the crucifixion, for in contemporary representations of Christ's resurrection and descent into hell he bears a three-pointed banner with cross above. The triple indentation so common on the flags of this period has been supposed to be the origin of one of the honorable ordinaries—the pile.

The powerful aid of religion seems ever to have been sought to give sanctity to national flags, and the origin of many can be traced to a sacred banner, as is notably the case with the oriflamme of France. The banner of William the Conqueror was sent to him by the pope, and the early English kings fought under the banners of Edward the Confessor and of St. Edmund; while the clumsily blended crosses of St. George, St. Andrew, and St. Patrick still form the national ensign of the three united kingdoms of England, Scotland, and Ireland, whose patron saints they severally were. More secular characters were, however, not uncommon. In 1244 Henry III. gave order for a "dragon to be made in fashion of a standard, of red silk sparkling all over with fine gold, the tongue of which should be made to resemble burning fire and appear to be continually moving, and the eyes of sapphires or other suitable stones." The *Siege of Carlaverock*, an Anglo-Norman poem of the 14th century, describes the heraldic bearings on the banners of the knights present with Edward I. at the siege of that fortress. Of the king himself the writer says—

> "En sa banniere trois luparte
> De or fin estoient mis en rouge;"

and he goes on to describe the kingly characteristics these may be supposed to symbolize. A MS. in British Museum (one of Sir Christopher Barker's Heraldic Collection, Harl. 4632) gives drawings of the standards of English kings from Edward III. to Henry VIII., which are roughly but artistically colored.

The terms for describing a flag are the same as those applied in heraldry to the corresponding parts of a shield. The part of a flag furthest from the point of suspension is called the "fly." The principal varieties of flags borne during the Middle Ages were the pennon, the banner, and the standard; guydhommes, bandirolls, pennoncells, streamers, etc., may be considered as minor varieties. The pennon (fig. 5, B) was a small personal ensign, pointed or swal-

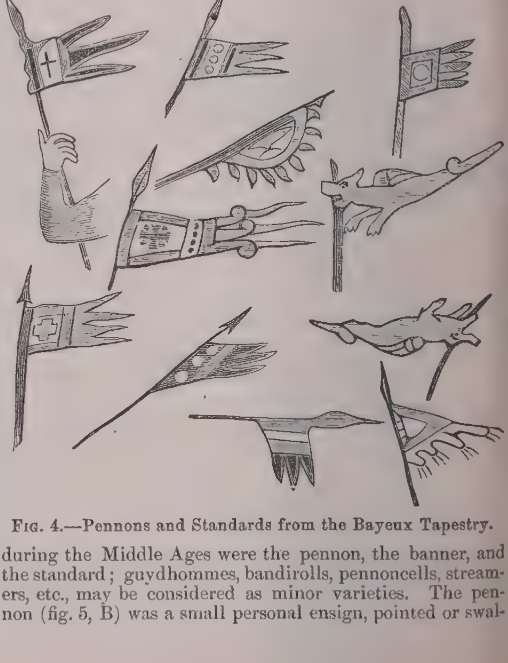


Fig. 4.—Pennons and Standards from the Bayeux Tapestry.

low-tailed, borne below the lance-head of its owner, and charged with his armorial bearings in such a manner that they were in true position when the lance was held horizontally for action. It was a strictly personal flag, and was borne by every knight. Pennons were sometimes charged with the cross of St. George in place of the personal bearings. A manuscript of the 16th century (Harl. 2358) in the British Museum, which gives minute particulars as to the size, shape, and bearings of standards, banners, pennons, guidhommes, pencells, etc., says—"A pennon must be two and a half yards long, made round at the end, and conteyneth the armes of the owner," and warns that "from his standard or streamer a man may flee, but not from his banner or pennon bearing his arms."

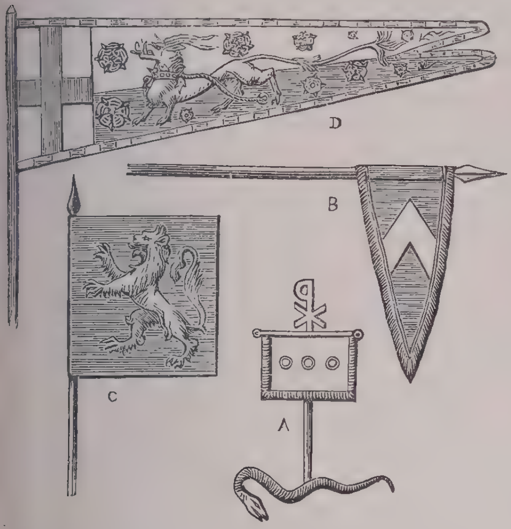


Fig. 5.—A, Labarum from medallion of Constantine; B, Mediæval Pennon; C, Mediæval Banner; D, Standard of Henry V.

The banner (fig. 5, C) was generally about square in form, charged in a manner exactly similar to the shield of the owner, and borne by knights bannerets, and all above them in rank. The rank of knights bannerets was higher than that of ordinary knights, and they could be created on the field of battle only. It was the custom, after a battle, for the king or commander in person to honor a knight who had distinguished himself in the conflict, by tearing off the fly of his knightly pennon, thus creating it a banner and its bearer a banneret. The banner was not a personal ensign but that of a troop. Every baron, who in time of war had furnished the proper number of men to his liege, was entitled to charge with his arms the banner which they followed.

The standard (fig. 5, D) was a large, long flag, gradually tapering towards the fly, varying in size according to the rank of the owner, and generally divided fesse-wise. The shape was not, however, by any means uniform during the Middle Ages, nor were there any definite rules as to its charges. It seems to have been first used by Edward III., the head of whose standard was charged as his shield of arms, and the fly powdered with *fleurs-de-lis* and lions. The Tudor manuscript mentioned above says of the royal standard of that time—"The standard to be sett before the king's pavillion or tente, and not to be borne in battayle; to be in length eleven yards." "Every standard and guydon to have in the chief the cross of St. George, the beast or crest with his devyce and word, and to be slitt at the end." The standard was always borne by an eminent person, and that of Henry V. at Agincourt is supposed to have been carried upon a car, and to have preceded the king. The guidon borne by a leader of horse "must be two yards and a half or three yards long, and therein shall no armes be put, but only the man's crest, cognizance, and devyce." A streamer was a long, tapering flag, and "shall stand in the top of a ship or in the forecastle, and therein be put no armes but a man's conceit or devyce, and may be of length 20, 30, 40, or 60 yards, and is slitt as well as a guydhomme or standard." A pencil was a small streamer-like flag borne by an esquire.

The present royal standard of England was hoisted on the Tower, January 1, 1801, and is thus described:—Quarterly: first and fourth, gules, three lions passant gardant, in pale, or, for England; second, or, a lion rampant, gules, within a double tressure, flory counter flory of the last, for Scotland; third, azure, a harp, or stringed argent, for Ireland. On an escutcheon of pretence were charged the arms of the sovereign's German dominions; but after the accession of Queen Victoria these were removed. This flag is displayed at the main whenever the sovereign or a member of the royal family is on board a ship, and is also hoisted over the royal residence. The Admiralty flag stands next to this in importance, and is red charged, fesse-wise, with an anchor and cable. The national ensign of the United Kingdom, the Union Jack, is the not altogether admirable result of an attempt to combine the several ensigns of the three countries. St. George had long been the patron saint of England, and his banner, argent, a cross gules, its national ensign (fig. 6, A). St. Andrew in the same way was the patron saint of Scotland, and his banner, azure, a saltire argent, the national ensign of Scotland (fig. 6, B). On the union of the two crowns, James I. issued a proclamation that "all subjects of this isle and the kingdom of Great Britain should bear in the main-top the red cross commonly called St. George's cross and the white cross commonly called St. Andrew's cross, joined together according to the form made by our own heralds." This was the first Union Jack (fig. 6, D). After the union with Ireland in 1801 a new ensign was ordered to be prepared which should combine the cross of St. Patrick, a saltire gules on a field argent (fig. 6, C), with the other two. The result was the "meteor flag of England," the present Union Jack (fig. 6, E). It seems to have been produced in considerable contempt of heraldic rules, but excites no less enthusiasm, respect, and obedience on that account. The flag of the lord lieutenant of Ireland is the Union Jack, having in the centre a blue shield charged with a golden harp.

The flags of the United States of America were very various before and after the Declaration of Independence; and even after the introduction of the stars and stripes, these underwent many changes in the manner of their arrangement before taking the position at present established. Historical events have also caused great changes in the standards and national ensigns of France. The ancient kings bore the blue hood of St. Martin upon their standards, and this was succeeded by the oriflamme, which, originally, was simply the banner of the abbey of St. Denis. At what precise period it became the sacred banner of all France is not known, and even its appearance is very differently described in different writers. Guillaume Guiart in his chronicle says—

"Oriflambe est une bannière
De cendal roujoiant et simple
Sanz portraiture d'autre affaire."

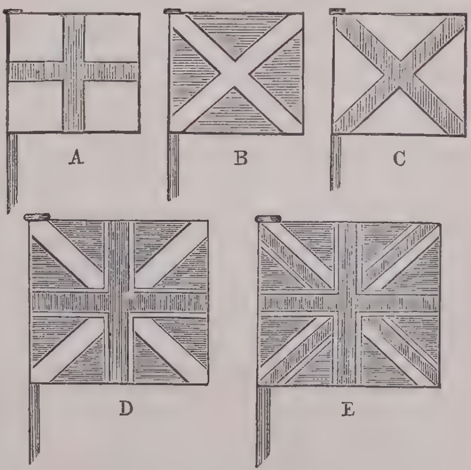


Fig. 6.—A, St. George's Banner; B, St. Andrew's Banner; C, St. Patrick's Banner; D, First Union Jack; E, Present Union Jack.

The oriflamme was succeeded in the 15th century by the white standard powdered with *fleurs-de-lis*, which itself gave place to the standard of the empire, and is the "cornette blanche" for which Chambord contends. The imperial standard was blue, bearing a golden eagle, and powdered with golden bees. The tricolor was introduced at the time of the Revolution, and is divided vertically into three parts, colored blue, white, and red—the red to the fly, and the white in the middle. The origin of this flag and its colors is a disputed question. It is said by some to have been intended to combine the colors of the St. Martin's banner, of the oriflamme, and of the white flag of the Bourbons; by others the colors are said to be those of the city of Paris; and other authorities assert that the flag is copied from the shield of the Orleans family as it appeared after Philip Égalité had knocked off the *fleurs-de-lis*. The present standards and ensigns of existing states are shown in Plate I.

In the British army the standards of the cavalry are the same in color as the regimental facings; they bear the insignia, cipher, number, and honors of the regiment, and are richly ornamented. Those of the household cavalry bear on a crimson field the royal insignia. The colors of each infantry regiment are two in number—the queen's color and the regimental color. The former is the Union Jack variously charged, the latter is in color like the regimental facings, and is charged with the honors, etc., of the corps. The queen's color of the foot guards, however, is crimson, and its regimental color the Union Jack. The royal artillery and the rifles have no colors.

Until 1864 the ships of the British navy bore three different ensigns. In that year, however, her Majesty prescribed the discontinuance of the division of flag officers into those of the red, blue, and white squadrons, and ordered that the white ensign, with its broad and narrow pendants, should be thenceforward established as the colors of the royal naval service, reserving the use of the red and blue colors for special occasions. The white flag with St. George's cross is borne by admirals, vice-admirals, and rear-admirals on their respective masts. The blue ensign is borne by ships in the service of public offices, and also under certain restrictions by such ships as are commanded by officers of the naval reserve. The red ensign is borne by all other British ships. Yacht clubs are allowed, however, certain privileges; they mostly carry the blue ensign with characteristic burgees. An admiral's flag is displayed at the main, a vice-admiral's at the fore, and a rear-admiral's at the mizen truck. Flag officer is another name for admiral, and the flag ship in a fleet is the one carrying the admiral's flag.

At sea the striking of the flag denotes surrender, and the flag of one country being placed over that of another denotes the victory of the former. A yellow flag denotes quarantine. The universally understood flag of truce is pure white.

Flags would obviously suggest themselves for use as signals, and have no doubt always more or less served for the purpose. The numerical systems of Sir Hume Popham and Captain Marryatt were very serviceable but limited in application, the sentences to which the numbers referred being arranged as in a dictionary. By the new commercial code the signals represent consonants, and by means of about a score of flags all the requisite communications can be made. A universal international code of signals would no doubt be a benefit. (W. HE.)

FLAG, or FLOWER DE LUCE, botanically *Iris*, the popular name of a genus of perennial plants of the natural order *Iridaceæ*, occurring in north temperate regions, and having the following characters:—Rootstock creeping, horizontal, thick, with dichotomous joints, or tuberous; leaves usually ensiform and equitant; flowers large and showy; the perianth (see BOTANY, vol. iv. p. 131, fig. 268) superior, with the three outer segments large, spreading or revolute, and frequently bearded at the base, and the three inner smaller, sub-erect, and converging; stamens three, inserted at base of outer segments of perianth, and concealed by the stigmas; anthers extrorse; stigmas three, petaloid, and arching over the stamens; capsule three-celled, dehiscing loculicidally; and seeds numerous, with a fleshy albumen. Many kinds of flag are cultivated in England, but only two species are indigenous. One of these, *Iris Pseudacorus*, the Yellow Flag or Iris, is common in Britain on river banks, and in marshes and ditches. It is called the "Water-flag" or "bastard Floure de-luce" by Gerard, who remarks that "although it be a water plant of nature, yet being planted in gardens it prospereth well." Its flowers appear in June and July, and are of a golden-yellow color. The leaves are from two to four feet long, and half an inch to an inch broad. Towards the latter part of the year they are eaten by cattle. The seeds are numerous and pale-brown; they have been recommended when roasted as a substitute for coffee, of which, however, they have not the properties. The astringent rhizome has diuretic, purgative, and emetic properties, and may, it is said, be used for dyeing black, and in the place of galls for ink-making. The other British species, *I. fœtidissima*, the Fetid Iris, Gladdon, or Roast-beef Plant, the *Xyris* or Stinking Gladdon of Gerard, is a native of England south of Durham, and also of Ireland, southern Europe, and North Africa. Its flowers are usually of a dull, leaden-blue color; the capsules, which remain attached to the plant throughout the winter, are 2 to 3 inches long; and the seeds scarlet. When bruised this species emits a peculiar and disagreeable odor. Among other flags common in Europe are *I. Germanica*, probably the Illyrian iris of the ancients, the purple blossoms of which are a common ornament of English gardens; *I. pallida*, a native of Istria, with pale-blue flowers; and *I. Florentina*, indigenous to the Macedonian coast and Asia Minor, having white flowers. The rhizomes or underground stems of these three species constitute the "orris-root" or *rhizoma Iridis* of pharmacy, formerly known as "ireos" or "orice," which is exported in considerable quantity from southern Europe, more especially from the neighborhood of Leghorn and Trieste. To prepare orris-root the rhizome is in August dug up and freed of its rootlets and brown outer bark; it is then dried, and packed in casks for sale. Orris-root occurs in commerce in whitish, knobby, sometimes branched pieces, of about the thickness of the thumb, and having on one side numerous pits where the rootlets were attached. It has a bitterish and acrid taste, and is purgative and emetic in properties. By drying it acquires the odor of violets. It is exported to India, where it is called *bekhbunufsha* (violet-root). By the ancients it was valued both for its odor and its healing virtues; and in England it was in past times in repute as a medicine for various complaints. Gerard states that "the root of the common Flower de-luce, cleane washed, and stamped with a few drops of Rose water, and laid plaister-wise upon the face of man or woman, doth in two days at the most take away the blacknesse or blewnesse of any stroke or bruse;" he further advocates the use of the same remedy in dropsy and infirmities of the chest. It is now employed in the preparation of violet-powder, and of scented hair and tooth-powders and oils, as a perfume for the breath, for making issue-peas, and occasionally as an errhine. At the risk of causing irritation of the mouth and disturbance of the bowels, it is sometimes given to teething infants to bite. In America the rhizome of *I. versicolor*, the Blue Flag, as also that of *I. Florentina*, is employed as a purgative and alterative in strumous complaints. Orris-root contains, besides gum, ligneous matter, and elliptical granules of starch, an acid resin, *iridin* or *irisin*, precipitable from the tincture by water, and said in small doses to act as a stimulant of the glandular system; also one-twelfth per cent. of a semi-solid substance, the *butter* or *camphor of orris*, which consists apparently of myristic acid with a little essential oil, and which with about 15 parts of spirits forms the *oil* or *essence of orris-root*. According to some writers the blossom of the iris is represented in the well-known heraldic device, the FLEUR-DE-LIS (*q. v.*). The ancient arms of Florence are a red shield bearing a white lily or iris.

The Sweet Flag, or Sweet Sedge, probably the ἄκορον of Dioscorides, is the species *Acorus Calamus*, L., a plant of the natural order *Acoraceæ* or *Orontiaceæ*. It has a wide distribution, growing in wet situations in the Himalayas, North America, Siberia, and various parts of Europe, including England, and has been naturalized in Scotland and Ireland. The leaves are sweet-scented, and are ensiform, equitant, 3 to 6 feet long, and two-thirds to 1½ inches broad; and the spadix is lateral, with bisexual flowers. The rhizome (*rhizoma calami aromatici*), which has a more powerful odor than the herbage, is creeping, horizontal, and woody; it has been employed as an aromatic stimulant, antispasmodic, and tonic. Sir J. E. Smith (*Eng. Flora*, ii. 158, 2d ed., 1828) mentions it as a popular remedy in Norfolk for ague. In India it is used as an insectifuge, and is administered in infantile diarrhœa. It is an ingredient in *pot-pourri*, is employed for flavoring beer, and is chewed to clear the voice; and its volatile oil is employed by makers of snuff and aromatic vinegar. The rhizome of *Acorus Calamus* is sometimes adulterated with that of *Iris Pseudacorus*, which however, is distinguishable by its lack of odor, astringent taste, and dark color.

See J. Gerard, *Herball*, edition of Thom. Johnson, 1633, p. 49 *sq.;* Lindley, *Med. and Œcon. Bot.*, 1856; J. D. Hooker, *The Student's Flora*, 1870; Flückiger and Hanbury, *Pharmacographia*, 1874; Bentley and Trimen, *Med. Plants*, tab. 273 and 279.

FLAGELLANTS. The practice of some form of flagellation as a religious observance is of very early origin, and has been more or less followed by nearly every nation, both savage and civilized. Special whipping ceremonies have also had a wide prevalence. According to Herodotus (ii. 40, 61), it was the custom of the ancient Egyptians to beat themselves during or after the sacrifice at the annual festival in honor of their goddess Isis. In Lacedæmon, at the festival of Artemis Orthia or Orthosia, the chief ceremony was that of the Diamastigosis, or flogging of youths before her altar,—a custom which is said to have been introduced by Lycurgus, and which is known to have existed down to the time of Tertullian. From Sparta it spread to other places in Greece, Asia Minor, and Italy (see vol. ii. p. 563). Flagellation was a prominent feature in the Roman festival of the *Lupercalia*, at which it was the custom of the Luperci to run through the most frequented parts of the city, having leathern thongs in their hands, with which they struck all whom they met, the blow being believed to have a salutary influence (see Ovid, *Fasti*, ii. 425 *sqq;* Plutarch, *Cæsar*, 61).

The discipline of flagellation was introduced at a very early period into the Christian Church as a punishment; the first recorded instances of it are isolated cases which happened about the beginning of the 5th century; thus Augustine (*Ep. 159 ad Marcell.*) mentions that in his day flogging was resorted to as a means of discipline, not only by parents and schoolmasters, but also by bishops in their courts; and Joannes Cassianus, writing about the same period, says of offending monks, "vel plagis emendantur vel expulsione purgantur." In the decrees of several provincial councils the practice is referred to as usual and right. But self-flagellation as a voluntary penance was not introduced till a considerably later period. The custom seems to have made but little progress till about the end of the 11th century, when it was largely recommended by the precepts and example of Cardinal Peter Damian; and in the 13th century fraternities were specially formed for its observance as a regular and public religious ceremony. The first of these was instituted about 1210 through the preaching of St. Anthony of Padua, but the new order did not make much progress till about 1260, when, finding a favorable soil in the penitence and fear resulting from the disastrous effects of the long-protracted Guelph and Ghibelline wars in Italy, it suddenly sprung up into vigorous growth through the exhortations and example of Rainer, a monk of Perugia. Great numbers of the inhabitants of this city, noble and ignoble, old and young, traversed the streets, carrying in their hands leathern thongs, with which, according to the chronicle of the monk of Padua, "they drew forth blood from their tortured bodies amid sighs and tears, singing at the same time penitential psalms, and entreating the compassion of the Deity." Many of them soon began a pilgrimage through the neighboring towns, and increasing in numbers as they went, some journeyed through Lombardy into Provence, and others carried the infection to Rome. As they at first effected a considerable improvement in the habits of the people, the religious authorities gave them their countenance; but the Ghibellines, dreading their political influence, prohibited them from entering their territories. Other bands of flagellants visited Bavaria, Bohemia, Austria, Hungary, and Poland, making many converts on their way; but their exhibitions gradually awakened the disgust of the better classes of society, and the tumult and disorder resulting from such large and promiscuous gatherings soon led to their prohibition both by the clergy and the civil rulers. The fraternities again made their appearance after the great plague in the 14th century, this time in Hungary, and spread thence through Germany. From the Continent 120 of them passed over into England, but they were finally obliged to retire without making a single convert. Pope Clement VI. fulminated a bull against the order 20th October, 1349; and the officers of the Inquisition during the papacy of Gregory XI. persecuted them with such vigor that the sect at last disappeared altogether. An attempt made in Thuringia in 1414 by Conrad Schmidt to revive the order under the name of Cryptoflagellants was suppressed by the trial and execution of that leader and the more prominent among his followers. In the 16th century a milder form of the practice was prevalent in France, especially in the southern parts of the kingdom; and in various places flagellating companies were formed, who, however, used the discipline chiefly in private, and only occasionally took part in public flagellating processions. Henry III. of France established a whipping brotherhood in Paris, and himself took part in the processions, but finding that his conduct so far from conferring on him any political benefit awakened only ridicule, he allowed his zeal for self-mortification to abate. The fraternities were suppressed in France by Henry IV., but until recent times the practice of self-flagellation continued to manifest itself intermittently in the south of France, and also in Italy and Spain; and so late as 1820 a procession of flagellants took place at Lisbon.

See Muratori, *Antiquitates Italicæ Medii Ævi;* Boileau, *Historia Flagellantium*, translated into English under the name *History of the Flagellants, or the Advantages of Discipline;* Helyot, *Histoire des ordres monastiques;* Gerson, *Contra sectum flagellantium;* Cooper, *Flagellation and the Flagellants;* Schneegans, *Die Geissler, namentlich die Geisselfahrt nach Strassburg*, 1349, Leipsic, 1840; and especially Förstemann, *Die christl. Geisslergesellschaften*, Halle, 1828, and the article by Dr. Zacher in Ersch and Gruber's *Encyclopädie*.

FLAGEOLET. See FLUTE.

FLAHAUT DE LA BILLARDERIE, AUGUSTE CHARLES JOSEPH, COMTE DE (1785–1870), a French general and diplomatist, was born in Paris on the 21st of April, 1785. His father, a field marshal in the royal army, succeeded Buffon as intendant of the royal gardens, and was guillotined at Arras in 1793. His mother, an ingenious and elegant novel-writer, known as Madame de Souza, from the name of her second husband, the Portuguese author J. M. de Souza-Botelho, emigrated with him to England, and, after he had spent some time in Germany for the sake of his education, brought him back to Paris in 1798. The following year, young Flahaut, being only fifteen years of age, enlisted in a troop of volunteer cavalry, who were to accompany General Bonaparte, then first consul, to Italy. He had a brilliant career, being successively aide-de-camp to Murat, Berthier, and Napoleon. In 1813 he was first gazetted general of brigade, and then general of division, and, although already a count by birth, received a second time this title from the great soldier of fortune, who sought by his simple fiat to create a new empire to be propped up by a new nobility. He was a peer of France during the Hundred Days, and supported with all his influence the project of making Marie-Louise regent, and of thus securing the imperial throne for the young king of Rome under the title of Napoleon II. On the second return of the Bourbons he left France, and lived in exile from 1815 to 1830. In England, his usual place of retreat, he married (28th July, 1817) the daughter of Admiral Keith, who became an Irish peeress as Baroness Keith in 1823, and succeeded to the Scottish barony of Nairn in 1838. By her he had no sons, but several daughters, the eldest of whom married the fourth marquis of Lansdowne. After the revolution of July, 1830, he returned to France, was restored to his former rank in the army, and was made a peer by the Government of Louis-Philippe. He soon became a favorite with the duke of Orleans, the king's eldest son, who gave him a situation of trust in his household. He also received at the same time the dignity of the grand cross of the Legion of Honor of which he had been a commander since 1814. His services as a diplomatist were made use of more than once: he was ambassador at Berlin in 1831, and at Vienna from 1842 until the revolution of 1848. When Louis Bonaparte became Napoleon III., Flahaut de la Billarderie, whose mother had brought up the duke of Morny, did not consider his fidelity as any longer pledged to the Orleans family, and was appointed senator (31st December, 1852). Nor was this the only imperial favor he could boast of. From 1860 until 1862 he was ambassador to London, and, on the 28th of January, 1864, he was promoted to the high dignity of grand chancellor of the Legion of Honor. After that time Flahaut did not play any considerable part in the management of public business. He died on the 1st of September, 1870.

FLAMBARD, RANULPH (RALPH), (d. 1128), bishop of Durham, and justiciar under William Rufus, was a Norman of low birth, who came to England in the train of William the Conqueror in 1066. He took holy orders, obtained several church preferments, and was appointed chaplain to the bishop of London, and made prebendary of St. Paul's. He demanded the deanery also, and this being refused him, he left the bishop's service. He afterwards passed into the service of the king, William II., who made him his chaplain. Ambitious, greedy, and unscrupulous, he flattered and ministered to the vices of his master, and thereby raised himself to the highest places in church and State. To fill the royal coffers he suggested various arbitrary and oppressive measures, by which he earned the hatred of the people, and at the same time the eulogy of the king, that he was the only man who, to please a master, dared to brave the vengeance of mankind. Flambard appears to have been the first to apply the feudal theory to the estates of the church. He suggested that they should be considered as fiefs or benefices held of the king, and that as such at every vacancy they devolved to the crown till the vacancy was supplied. The lesson was quickly learnt, and the immediate consequence was that benefices were kept vacant during the king's pleasure, and refilled only on payment of a large sum of money. It was not till after the death of Lanfranc that the king gave himself up unreservedly to the influence of Flambard. The justiciar obtained for himself the custody of the vacant abbeys of Winchester and Chertsey, the bishopric of Lincoln, and the archbishopric of Canterbury. His extortion and oppressions drew upon him the curses of the clergy as well as of the people, and in 1099 an attempt was made to murder him at sea. But a storm arose and his murderers quarrelled, and Flambard was allowed to land again. He then reappeared at court and was rewarded with the see of Durham. But he was at last "hoist with his own petard;" for at his consecration he had to make the king a present of £1000. On the death of William II., in the following year, the bishop, to satisfy the outcries of the people, was sent to the Tower, "the first man," says Mr. Freeman, "recorded to have dwelled as a prisoner in the Conqueror's fortress." He fared sumptuously in his confinement, treated his keepers, and at length, in February, 1101, managed to escape from the Tower, and fled to Normandy. There he joined Duke Robert, instigated him to the invasion of England, and returned to England with him. He was ultimately restored to his see, and appears to have occupied himself thenceforward with its duties, and in various architectural works—the completion of his cathedral, the building of Norham Castle, and the fortification of Durham. He endowed the college of Christchurch and founded the priory of Mottisford. Flambard died September 5, 1128.

FLAME. An ordinary flame consists of a gas or vapor burning in contact with the air, and in most cases emitting light of greater or less intensity. It is thus distinguishable from the mere incandescence or glow produced by a burning body which does not become gaseous previous to combustion. Many solid substances, however, burn with flame, because under the influence of heat they either, as wood and coal, evolve combustible gases and vapors, or, as zinc, sulphur, and phosphorus, become volatile. Charcoal, although a solid, when brightly heated in a furnace yields flame, since carbon dioxide, or carbonic acid gas, in passing through it, furnishes the combustible gas carbon monoxide, or carbonic oxide. When the air or other supporter of combustion is intimately mixed with the combustible gas, ignition occasions an explosion, and the flame resulting is instantaneous and equally luminous throughout. The dark inner cone of a candle-flame (see BLOWPIPE, vol. iii. p. 728, col. 1) is formed by the volatilized tallow raised by the capillary action of the wick, together with carbonic oxide, carbonic acid gas, and water vapor from the combustion going on in the outer part of the flame, and atmospheric nitrogen, but no free oxygen. By means of a short tube inserted into it, the inner cone of the flame may be made to yield up a portion of its contents; the application of a light to the other end of the tube shows that they are combustible. That within the flame they are not ignited may be demonstrated in many ways. Thus, if a piece of paper be depressed upon the flame for a few seconds, that part of it which touches the central part of the flame is not charred. Again when a platinum wire is held horizontally in a candle flame, it is heated to redness at the two parts where it is in contact with the outer zones of combustion, remaining dark between them. In the intermediate, white-hot, and luminous zone of the candle flame the oxidation of the gases yielded by the inner core is chiefly effected. The reducing effect of the flame is greatest at the surface of contact of these two portions. On account of the slower combustion, the smaller proportion of unoxidized gases, and the greater penetration of oxygen at the upper part of the flame, the luminous zone is thicker, but less bright above than below. In the outer non-luminous zone or mantle, which envelops the whole flame except at its base, combustion is completed. The mantle may be conveniently observed by interposing a small piece of card between the luminous cone and the eye. At the base of the flame, reaching a little upward towards the inner cone, is a light blue zone.

The composition of wax and tallow flames, according to Hilgard, is hydrogen, marsh-gas, olefiant gas, carbon monoxide, carbon dioxide, nitrogen in large proportion, and small quantities of substances condensable to solids or liquids. The same gaseous constituents were found by Landolt in coal-gas, with tetrylene, water, and a very little oxygen. The size of a flame is in relation to the amount of oxygen required to consume a definite bulk of its constituent gas, and to the purity of the oxygen supplied. Hence the flames produced by the same bulk of different gases vary considerably in magnitude, the flame of hydrogen being smaller than that of olefiant gas, but larger than that of a mixture of hydrogen and nitrogen. The flame of oxygen burning in marsh-gas, of which it needs only half its volume for complete combination, is much smaller than that of oxygen burning in hydrogen, of which latter two volumes are required. The tapering shape of a candle-flame results from the spreading of the gases set free in its interior, from the ascent of the products of combustion, owing to their having a higher temperature and consequently a lower density than air, from the currents in the cooler atmosphere around it thereby occasioned, and, lastly, from the exhaustion of combustible material at the upper part of the flame. A flame of large size tends to be irregular in form through variations in the force of air-currents. By altering the atmospheric pressure to which they are subjected, flames may be made to differ considerably in shape. Thus at two atmospheres of pressure the flame of a sperm candle is spike-like, and scarcely one quarter of an inch in diameter below, whilst its upper part is enveloped in smoke, in which the apex is concealed. When the normal pressure is gradually reduced to that of half an atmosphere, the flame is changed in appearance chiefly through diminution of its luminosity; but as the pressure is lowered thence to that of six inches of mercury, the flame becomes globular, and assumes a greenish-blue tint. "Just before the disappearance of the yellow portion of the flame, there comes into view a splendid halo of pinkish light," due probably to incandescent nitrogen, "forming a shell half an inch thick around the blue-green nucleus, and thus greatly enlarging the dimensions of the flame" (Frankland). The color of flames, due, according to Heumann, to heated vapors, is dependent principally on their temperature and on the nature of bodies contained in them. The flame of carbonic oxide, ordinarily blue, is yellowish-red if the gas be heated before ignition. The color of flames is subject also to modification according as one or other of any two gases burnt together is made the supporter of combustion.

Flames may be classed as luminous, such, *e.g.*, as those produced by the burning of wax, tallow, oils, and other carbonaceous substances, and metals; and non-luminous, as those of hydrogen, alcohol, sulphur, and carbon monoxide. A good illuminating flame may readily be procured from a non-illuminant gas by saturating it with the vapor of a heavy hydrocarbon; thus hydrogen and marsh gas, when burnt with one pound of benzol, give a light equal to that yielded by 5·793 ℔ and 7·682 ℔ of spermaceti respectively. The diluents of coal-gas, namely hydrogen, carbon monoxide, and marsh gas, afford practically no light; the light given by the illuminants is not, however, altogether independent of the relative proportions of the diluents (Frankland and Thorne, in *Journ. Chem. Soc.*, March, 1878, p. 94). Flames transparent for all lights are non-luminous, since the power of an incandescent gas at a given temperature to absorb and its power to emit light are proportional to each other.

Sir H. Davy, from experimental investigations, was led to the conclusion that the luminosity of flames is caused by minute solid particles of incandescent carbon or other substances set free from the combustible body by heat. From researches by Frankland and other physicists it appears that this view is not tenable in respect to all flames. The flame of arsenic burning in oxygen emits a remarkably intense white light, although neither the metal nor the product of its combustion, arsenious acid, is gaseous at the temperature of the flame. Again, carbon disulphide and nitric oxide give on combustion together a light which is almost unbearable by the eye, and which, like that of a coal-gas flame, affords a perfectly continuous spectrum, and yet no solid particles are concerned in its production. From these and similar facts, and from the seeming transparency of illuminating flames, it has been concluded by Frankland and others that although a non-luminous flame may be rendered luminous by the introduction into it of substances in the solid condition, *e.g.*, asbestos, platinum wire, and fine powders, the light-giving power of ordinary flames is dependent to a great extent on the density of their constituent gases and vapors, and not on the presence in them of any solid particles. Further, the deposits of soot formed by the flames of ordinary illuminants on bodies with which they come in contact have been regarded as consisting, not of solid carbon set free by the elective affinity of oxygen[1] for the hydrogen of the hydrocarbon, but of mixtures of condensed hydrocarbons of remarkably high boiling-points. The observations of several experimenters do not, however, bear out these conclusions. M. J. L. Soret has demonstrated that the supposed transparency of many flames at high temperatures does not exist, and that at least for ordinary flames Davy's theory of the production of luminosity holds good,—"a pencil of solar light being reflected by diffusion and polarized in precisely the same manner, whether it falls on a very brilliant flame, or whether it illuminates non-incandescent smoke, in which the presence of carbon particles is incontestable" (see *Archives des Science*, July, 1874, trans. in *Phil. Mag.*, 1875). Stein, moreover, has proved that the sooty deposit obtainable from a coal-gas flame contains not more than 9 per cent. of hydrogen, and that, were it merely condensed vapor, exposure to a high temperature would cause its volatilization, which, however, is not the case (see *Journ. Pract. Chem.*, new series, vol. viii. p. 402). Heumann holds that for the production of light from a hydrocarbon flame a high temperature is requisite,—first, to set free solid particles of carbon, and, secondly, to maintain these in a state of incandescence. In support of the theory that the luminosity of hydrocarbon flames does result from the existence within them of carbon particles he points out—

(1) That the luminous mantle of a hydrocarbon flame (as Stein also has proved) is not altogether transparent, the appearance of a continuous image when an object is viewed through the flame being attributable probably to the smallness of the illuminating particles and their rapid motion;

(2) That flames the luminosity of which is due to the presence of finely divided solid matter give shadows when viewed in sunlight; also that luminous hydrocarbon flames give shadows; and that the only light-giving flames that are shadowless are those consisting of glowing gases and vapors;

(3) That chlorine increases the luminosity of feebly luminous hydrocarbon flames by setting free in them particles of what must certainly be pure carbon;

(4) That the presence of solid particles in a hydrocarbon flame may be demonstrated by causing it to impinge upon a heated surface, or upon a similar flame; and

(5) That the lower surface of a small rod placed in a flame becomes covered with soot, which has been separated in the lower portion of the flame. This deposit cannot be the result of the cooling action of the rod, as it is not formed on all sides of the rod, and may be produced on hot as well as cold bodies introduced into the flame.

The influence of pressure upon luminosity has next to be considered. It was shown by Davy in 1817 that the intensity of the light of flames is increased by the condensation and diminished by the rarefaction of the atmosphere. Frankland has proved that flames ordinarily non-luminous, as those of hydrogen, carbonic oxide, and alcohol, can be made highly luminous by condensing the atmosphere in which they burn. Hydrogen yielding, under a pressure of three atmospheres, light estimated at one unit, at twelve atmospheres gives a light of 100 units. On the other hand the flame of arsenic in oxygen loses greatly in luminosity when subjected to reduced pressure. For each decrement of pressure from 30 down to 14 inches of mercury, according to Frankland, the flames of candles undergo an equal or nearly equal loss of luminosity; for lower pressures the diminution is less rapid. The blue portion of the flames of candles burnt on the summit of Mont Blanc was found by the same experimenter to extend to the height of one-eighth of an inch above the cotton, the rate of combustion being the same as at Chamounix; and it has been computed by him that, owing to the difference of barometric pressure in the two cities, the illuminating effects of the same sample of coal-gas in London and Mexico must be in the ratio of 100 to 46·2. From the above-mentioned facts the inference has been drawn that the decrease in light caused by rarefaction of air is attributable to the greater mobility at low pressures, and consequent readier oxidation of gaseous bodies, and also to the increase in the size of the flame. Conversely, the greater luminosity under pressure has been ascribed to the augmentation of the density of the burning gas or vapor thereby occasioned. It has, however, been proved that, although the density of constituents is not without effect on the luminosity of flames, it cannot be considered alone as a cause of this phenomenon, since at high pressures the temperature of a flame is increased. (See Deville, *Compt. Rend.*, lxvii. 1089.) Now, although the light and heat of flames are not related in degree, for the flame of the oxyhydrogen lamp, the hottest known, is scarcely luminous, yet for the same kind of flame luminosity increases with temperature.

The influence of temperature on luminosity may be exemplified in various ways. Thus, if the cooling of a flame be checked by decreasing its surface in respect of its volume, a greater amount of light is obtained. The smoky flame of turpentine becomes luminous when its temperature is raised; and if, by the use of an outer glass cylinder in addition to an ordinary lamp chimney, the air supplying a flame be warmed at the expense of the escaping products of combustion, a considerable increase of light is the result. Heumann finds that the cooling effect of a metallic burner on a gas flame notably diminishes its luminosity; and he attributes the greater intensity of the light observed when the burner is heated to an earlier separation of carbon particles in the flame, and to their more vivid incandescence.

Considerable insight into the conditions of the luminosity of flame has been afforded by experiments with mixtures of illuminating gas and air. The light of pure coal-gas being reckoned at 100 units, that of gas with 10 per cent. of air is 33 units, with 20 per cent. 7, with 30 per cent. 2, and with 40 per cent. 0 (Frankland). The non-luminosity of the flame of the Bunsen lamp, by means of which a mixture of coal-gas with 2 to 2½ times its bulk of air is burnt, has been ascribed by some to the rapid destruction of the illuminants of the gas by the oxygen of the admixed air; but some further explanation of the phenomenon is evidently necessary, since the volume of air employed is inadequate for the complete oxidation of the gas, and the flame is still lightless if hydrogen, carbonic oxide, steam, or indifferent gases, as nitrogen, carbon dioxide, or hydrochloric acid, be substituted for air. Wibel (*Deut. Chem. Ges. Ber.*, viii. 226), finding that the heating of the gas and air previous to ignition renders the flame luminous, concludes that the non-luminosity of the flame is the result of the cooling action of the gases entering it; but, as Heumann points out, it cannot be wholly due to this cause, for the temperature of the non-luminous flame of the Bunsen burner, as also of the blowpipe, is much above that of ordinary flames. From the observations of Stein (*J. Pract. Chem.*, ix. 183), who shows that a flame made non-luminous by nitrogen is yet hot enough to decompose coal-gas, and that carbon monoxide, which has a pyrometric effect nearly equal to that of coal-gas, renders the flame of that gas non-luminous without lowering its temperature, it is evident that the mere introduction of a diluent into a burning gas diminishes its light, independently of any absorption of heat to which it may give rise. Heumann finds that decrease of luminosity through dilution and cooling takes place when a gas-flame giving light in ordinary air is plunged into a mixture of five volumes of air with two volumes of carbon dioxide, or when the products of combustion are allowed to accumulate in the air in which the flame is burning.

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[1] Compare the action of palladium sponge and foil on various hydrocarbon flames, probably through occlusion of hydrogen. See Wöhler, in *Phil. Mag.*, 1877, p. 35.

The degree of rapidity with which oxidation takes place is a condition which affects very considerably the luminosity of flames. If a small flame, free from unoxidizable substances, be placed in pure oxygen, its light becomes feeble, since the illuminants, instead of spreading through it in an incandescent state, are speedily oxidized; within certain limits, therefore, the mixture with the oxygen of an inert gas, *e. g.*, nitrogen or carbon dioxide, increases the luminosity of the flame. The simplest form of gas-burner, having a single orifice only, affords the minimum amount of light, as the gas rushes without interruption into the air. When, however, as by the use of the fishtail burner, two jets of gas are made to impinge upon each other, the velocity with which the illuminants are driven through the flame and oxidized is retarded, with the effect of considerably augmenting the light. The insertion of a small piece of platinum plate between the two jets, as in Scholl's "platinum perfecter," by reducing still more their velocity, causes a further increase in the luminosity of the flame (Frankland).

The temperature of flames differs considerably according to the conditions of combustion and the nature of the substance burnt. That of hydrogen in air, calculated from its absolute thermal effect as measured by Favre and Silbermann, is 2080° C.; that of carbon monoxide, 2828°; and that of marsh-gas, 1935°. The oxyhydrogen flame has a temperature estimated by Bunsen at 2844° C. The flame of a common candle in its hottest portion is at a temperature high enough to melt a small filament of platinum held in it. Deville, experimenting with a mixture of oxygen and carbon monoxide, found that, at 54 millimetres above the orifice of the burner employed, the flame was hot enough to melt gold; at 12 mm. it melted platinum; and at about 2 mm. lower, at the apex of the inner cone of the flame or a little beneath it, the highest temperature was indicated. The temperature of the flame of alcohol, according to Becquerel, is nearly 1204° C. (2200° Fahr.). M. F. Rossetti (*Journ. de Phys.*, vii. 61), by means of a thermo-electric element of iron and platinum, estimated the temperature of the external envelope of a Bunsen flame at 1350° C., that of the violet portion at 1250°, and that of the blue at 1200°, the temperature in the central dark cone ranging from 250° to 650°. The flame of a mixture of two volumes of illuminating gas with three of carbon monoxide indicated a temperature of 1000°. The determination of the higher temperatures of flame by means of thermo-electricity is, however, open to considerable sources of errors.

The nature and the continuance of the combustion of a flame depend (1) on the supply of the supporter of the combustion; (2) on the ignition-temperature of the gas or vapor; and (3) on the heat produced in burning, and therefore on the degree of rarefaction of the atmosphere, which by lessening chemical combination diminishes the heat of the flame.

(1) In the case of all ordinary flames the oxygen of the air is the supporter of combustion, and of this a free supply is requisite. A combustible hydrocarbon containing more than six parts of carbon to one of hydrogen burns with a smoky flame in air, unless a free draught can be provided by the use of a lamp-glass. A coal-gas flame supplied by an orifice of one quarter of an inch in diameter is not smokeless when higher than 2½ inches; but the flame is rendered clear if by lengthening or dividing the aperture of the jet the exposure of a larger extent of its surface to the air is effected.

(2) Davy (*Phil. Trans.*, 1816, pt. i. p. 117) points out that a large quantity of air thrown upon a small flame lowers its heat below the exploding point of its constituents, and that the extinction of a flame by blowing upon it is probably produced by that cause, assisted by the dilution of the explosive mixture. The fact that, by the presence or neighborhood of a cooler body, the temperature of a heated gas or vapor is lowered beneath the igniting point, explains the action of the wire gauze of the Davy lamp (see COAL, vol. vi. p. 68), and also explains why a candle-flame does not quite touch its wick, or a gas-flame its burner, unless the latter be somewhat strongly heated. The presence of an inactive gas hinders, and if in large quantity prevents, by its cooling action, the explosion of gases. The rate of propagation of ignition in gaseous mixtures thus varies not only with the nature of their combustible constituents, but with the degree to which these are diluted with indifferent gases. The rate in a mixture of hydrogen and oxygen in combining proportions is 34 millimetres a second; and that in a similar mixture of carbonic oxide and oxygen is less than 1 mm. a second (see Bunsen in *Pogg. Ann.*, cxxxi. 165). The maximum velocity of the propagation of ignition for marsh-gas and air, according to M. E. Mallard (*Ann. des Mines*, iii. 355, 1875), is ·524 mm., the minimum ·041 mm. a second; the velocities of coal-gas and air are maximum 1·01 mm. and minimum 0·097 mm. a second. A jet of combustible gas at high pressure, or much diluted with inert gases, can be ignited only at a considerable distance from the orifice at which it issues, owing apparently to the cooling action of the gas itself and of the outer air, and perhaps more especially to the velocity of the gas being greater than that of the propagation of ignition within it (Heumann).

(3) From numerous experiments, chiefly with gases, Davy concluded, first, that the extinction of flame on rarefaction of the atmosphere takes place only when the heat produced by the burning body is insufficient to keep up the combustion, the mere removal of pressure from the burning body being without effect on its combustibility; and secondly, that therefore those bodies which require least heat for their combustion burn in more rarefied air than those requiring more heat, and those which produce much heat in their combustion, other circumstances being the same, burn in more rarefied air than those producing little heat (*Phil. Trans.*, 1817). Hence the extinction of a gas by rarefaction is hindered by raising its temperature. Davy found that a mixture of oxygen and hydrogen in combining proportions could not be exploded when rarefied to one eighteenth of its normal density, and that hydrogen would not burn at a pressure of one-seventh of an atmosphere. Compression tends to make the combustion of flames less perfect, so that flames smoky at ordinary pressure can be rendered smokeless by rarefying the atmosphere in which they are burning.

It has been shown by Professor R. Bunsen that the combustion of a uniform mixture of an inflammable gas with oxygen takes places discontinuously. Thus, when a mixture of carbon monoxide and oxygen in combining proportions is exploded in a closed vessel, its temperature rises from 0° to 3033° C., and two-thirds of the carbon monoxide remains unconsumed and incombustible until, by radiation and conduction, the temperature sinks to 2558° C. Below this temperature a second burning begins, which restores the temperature to 2558° C., at which point it abides stationary until exactly half the carbon monoxide is consumed. The inflamed mixture now cools to 1146° C., when the combustion ceases; it must, however, be afterwards continued at lower as at higher temperatures, since the product of combustion consists eventually, on cooling, of carbon dioxide only. Bunsen has further pointed out that there is a simple molecular relation between the quantities of compounds which, in favorable circumstances, are formed simultaneously in a perfectly uniform gaseous mixture; as, for example, when water and carbon dioxide are produced from hydrogen and carbon monoxide burnt with less oxygen than suffices for the combustion of both. (*Cf.* CHEMISTRY, vol. v. p. 418, col. 2.) This relation undergoes sudden alterations by the addition, by degrees, of a third body, as oxygen, the homogeneous nature of the mixture not being affected. (See *Phil. Mag.* [4], xxxiv. p. 489, 1867.)

The radiation of heat from the flame of a Bunsen burner is considerably less than that from a luminous gas flame, and by most vapors is less powerfully absorbed. The absorption by the air of the heat radiated from a hydrogen flame, the source of which is the aqueous vapor produced by the combustion, has been shown by Tyndall to be due to the presence of moisture in the air, dry air being actually transparent to the radiations of the flame, whereas on humid days undried air may absorb as much as 20·3 per cent. of them. This phenomenon is explicable on the theory that, notwithstanding the high temperature of the flame, there is an accord between its oscillating molecules and those of aqueous vapor at the ordinary temperature, the heat of the flame increasing the amplitude but not the rate of its molecular vibration. When a carbonic oxide flame, the product of which is carbonic acid gas, is made to radiate through an atmosphere of the same gas, the absorption is very great, insomuch that, at a pressure of four inches, 65 per cent. of the radiation is cut off. The radiation of heat from a flame, it is thus apparent, depends on the length of the heat waves to which, according to the nature of its products, it gives rise, and on the character of the atmosphere through which the radiations have to pass. The products of the combustion of alcohol are aqueous vapor and carbonic acid gas, the heat rays of which have a slow period of vibration and correspond to the ultra red rays of the spectrum. The temperature of an alcohol flame may be lowered by plunging into it a spiral of platinum wire, but its heat, being thereby converted into heat of higher refrangibility, is consequently more readily transmitted through some substances, such as glass, than that of the original flame. (See Tyndall, *Heat as a Mode of Motion*, 5th ed., 1875, p. 385 *sq.*)

The phenomena of singing flames have already been alluded to (Acoustics, vol. i. p. 107). M. C. Decharme has produced persistent and varied sounds by directing a jet of air from a tube with a diameter of 3 to 5 mm. on a gas-flame supplied by an orifice of similar diameter. The effect of the jet of air seems to be attributable in great measure to its chemical besides its mechanical action. By altering the diameter and position of the tubes, and the nature and pressure of the gas and air, the sounds and the color and shape of the flame may be greatly modified. (*Compt. Rend.*, lxxx. p. 1602.) On the spectra of flames see Spectrum Analysis.

In consequence of the rarefaction of the air which it occasions, and also its tapering form, flame acts with great rapidity in dissipating a charge of electricity. It has been shown by Grove (*Phil. Mag.*, 1854 [4], vii. 47) that a current of electricity is transmitted in flame, and is produced in it probably by chemical action.

Dr. Edmund Hoppe, in a paper on the electrical resistance of flames (*Nachrichten v. d. K. Ges. d. Wiss. u. d. Georg-Augusts-Universität*, 1877, p. 313), concludes as the result of his experimental investigations that—

> (1) For every flame the electric conductivity increases with an increase of the heat and of the amount of the burning gases; (2) The relative conductivity of different flames is dependent on the nature of the substances burnt; the vapors of salts and solutions are particularly efficient in augmenting the conductivity of the flame of hydrogen; and (3) Ohm's law, contrary to the surmise of Hankel (*Abh. d. Königl. Sächs. Ges. d. Wiss.*, v. p. 72, 1861) is applicable to the case of flames.

The diamagnetism of flame, on its discovery by M. P. Bancalari, was in 1847 investigated both by Zantedeschi and Faraday. When placed in various positions between the poles of a powerful electro-magnet, the flame of a wax taper becomes inclined, or assumes a fishtail shape, or even spreads out right and left in an equatorial direction between the poles, producing a double flame with two long tongues. Faraday found that when a small flame only about one third of an inch high was used, the magnetic force flattened it into an equatorial disc. The brightest flames appeared to him to be the most diamagnetic (Faraday, *Exp. Researches*, vol. iii. pp. 467, 487, 490).

See, in addition to the authorities quoted above, *Works of Sir H. Davy*, ed. by Dr. John Davy, vol. vi. pp. 1–130, 1840; Frankland, *A Course of Lectures on Coal-Gas*, 1867, and *Experimental Researches*, 1877; and Dr. Karl Heumann, *Contributions to the Theory of Luminous Flames*, translated by M. M. Pattison Muir from Liebig's *Ann. der Chemie*, vol. clxxxi. pt. 2, pp. 129–153, and vol. clxxxii. pp. 1–29, in *Phil. Mag.*, 1877, pp. 1, 98, 366. On the transparency of colored flames, see Gouy, *Compt. Rend.*, lxxxvi. 878–880. See also Gas. (F. H. B.)

FLAMEL, Nicolas, a reputed French alchemist, and a caligrapher to the university of Paris, was born about 1330. Becoming a money lender, he amassed immense wealth, with which he built a large number of churches and endowed various charities. He died at Paris 22d March, 1418, and was buried in the church of Saint-Jacques-la-Boucherie, to which he bequeathed the bulk of his property. His unusual prosperity acquired for him, either during his life or shortly after his death, the reputation of being an alchemist, and gradually his history became incrusted with legend. It was said that he accidentally discovered the secret of alchemy in an old book by a Jewish astrologer which happened to come into his hands, and that after reaching a good old age in France, he and his wife mysteriously disappeared, presumably to live in splendor in the East through the aid of the philosopher's stone. A book on alchemy exists in the imperial library of Paris with an inscription professing to have been written by Nicolas Flamel, but plainly a forgery. In 1561, also, a small treatise entitled *Sommaire Philosophique de Nicolas Flamel* was published among a collection of alchemist treatises entitled *Transformation métallique*. These and similar inventions were, however, exploded by Vilain's *Essai sur l'Historie de Saint-Jacques-la-Boucherie*, 1758, which contains an account of the life of Flamel, derived from the archives and other authentic documents of the parish. See also *Description de la Ville de Paris au quinzième Siècle, par Guillebert de Metz*, published for the first time from De Metz's manuscript by Leroux de Lincy, Paris, 1855.

FLAMEN, a Roman sacrificial priest. The flamens were under the direction of the pontifices, and were consecrated to the service of some particular deity. The highest in rank were the Flamen Dialis, Flamen Martialis, and Flamen Quirinalis, who were always selected from among the patricians. When the number of flamens was raised from three to fifteen, those already mentioned were entitled *majores*, in contradistinction to the other twelve, who were called *minores*, and were chosen from the plebs. The flamens were held to be elected for life, but they might be compelled to resign office for neglect of duty, or on the occurrence of some ill-omened event during the performance of their rites. The official dress of the flamens was the *apex* or cap (surmounted with a piece of pointed olive-wood, round the base of which a lock of wool[1] was twisted), the *læna* or mantle, and a laurel wreath. The highest of all these priests was the Flamen Dialis, or flamen of Jupiter, who in virtue of his office was entitled to a lictor, to a seat in the senate, to a curule chair, and to the *toga prætexta*, woven by his wife of thick wool. The sight of fetters being forbidden him, his toga was not allowed to be tied in a knot but was fastened by means of clasps, and the only kind of ring permitted to be worn on his finger was a broken one. If a person in fetters took refuge in his house he was immediately loosed from his bonds; and if a criminal on his way to the scene of his punishment met him and threw himself at his feet he was respited for that day. The flamen Dialis was not allowed to leave the city for a single night, to ride or even touch a horse (a restriction which incapacitated him for the consulship), to swear an oath, to look at an army, or to witness the business of daily life. His marriage was dissoluble only by death. His wife was called flaminica, and was obliged to assist her husband at the sacrifices and other religious duties which he performed. She wore long woollen robes, a purple veil, and shoes made of the leather of sacrificed animals, and, like her husband, she carried the sacrificial knife. Some of the municipal towns in Italy had flamens as well as Rome. When it became customary to deify the emperors, flamens were appointed in all the provincial towns to superintend their worship.

FLAMINGO (Portuguese *Flamingo*, Spanish *Flamenco*), a Water-bird conspicuous for the bright scarlet or flame-colored patch upon its wings, and long known by its classic name *Phœnicopterus* as an inhabitant of most of the countries bordering the Mediterranean Sea, in some of which it is still far from uncommon.[2] Other species have since been discovered, and both its common and scientific names are now used in a general sense. The true position of the Flamingoes (*Phœnicopteridæ*) has been much debated, and ornithologists are as yet by no means agreed upon it. Professor Huxley (*Proc. Zool. Soc.*, 1867, p. 460) considers the form "so completely intermediate between the Anserine birds on the one side, and the Storks and Herons on the other, that it can be ranged with neither."[3] And he puts it by itself as the type of a group *Amphimorphæ* under the larger assemblage of *Desmognathæ*. To the present writer its affinity to the *Anatidæ* seems on many accounts to be the strongest, but that it should stand as a distinct family is manifest.

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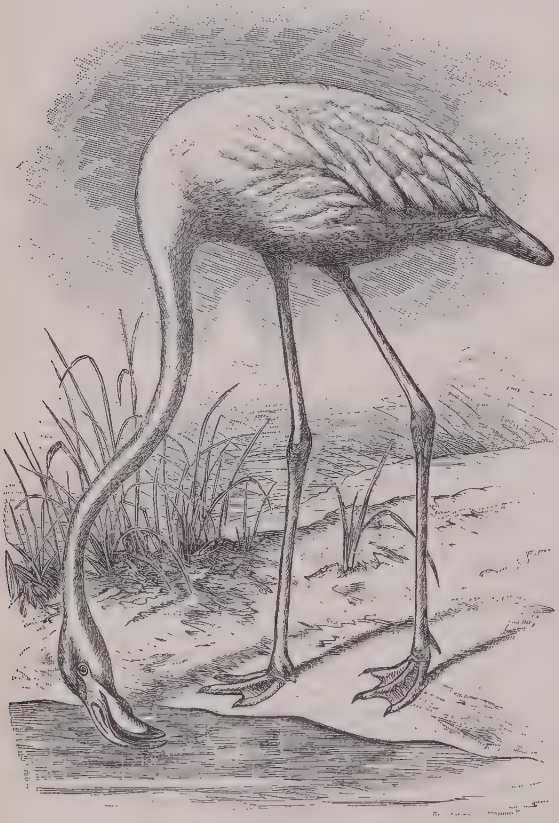
[1] *Filum*, whence, according to Varro and Festus, the name flamen, "quasi filamen," was derived.

[2] In Greece and Asia Minor, however, it is rare, and to this cause is most likely to be attributed Aristotle's silence concerning it, though it was known to Aristophanes.

[3] Thus confirming the opinion of Linnæus a century old (*Syst., Nat.*, ed. 12, i. p. 230):—"Medium inter *Anseres et Grallas*, si quis ad præcedentem ordinem referat, forte non errat." He himself places it among the latter.

Though not a few birds have in proportion to the size of their body very long legs and a very long neck, yet the way in which both are employed by the Flamingo seems to be absolutely singular. In taking its food this bird reverses the ordinary position of its head so as to hold the crown downwards and to look backwards. The peculiar formation of the bill, which to the ordinary observer looks as if broken, is, of course, correlated with this habit of feeding, as well as the fact that the *maxilla* is (contrary to what obtains in most birds) not only highly movable, but is much smaller than the *mandibula*—while the latter is practically fixed. Both jaws are, however, beset with *lamellæ*, as in most of the Duck-tribe, and the food is thereby sifted out of the mud as the Flamingo wades with its long neck stretching to the bottom of the shallow waters it frequents. Still more extraordinary is one of the uses made of its long legs. The hen stands upon them[1] while performing that duty which in other birds is rightly called "sitting." This fact was noticed so long ago as 1683 by Dampier, and his statement has been confirmed by the evidence collected by many other travellers. It does not appear, however, that the act has been personally witnessed by any author subsequent to him, and therefore his quaint and obviously truthful account of the way in which Flamingoes build their nests and hatch their young, as observed by him in the Cape Verd Islands, may here be quoted:—"They build their Nests in shallow Ponds, where there is much Mud, which they scrape together, making little Hillocks, like small Islands, appearing out of the Water a foot and half high from the bottom. They make the foundation of these Hillocks broad, bringing them up tapering to the top, where they leave a small hollow pit to lay their Eggs in; and when they either lay their Eggs, or hatch them, they stand all the while, not on the Hillock, but close by it with their legs on the ground and in the water, resting themselves against the Hillock, and covering the hollow Nest upon it with their Rumps: For their Legs are very long; and building thus, as they do, upon the ground, they could neither draw their Legs conveniently into their Nests, nor sit down upon them otherwise than by resting their whole bodies there, to the prejudice of their eggs or their young, were it not for this admirable contrivance, which they have by natural instinct. They never lay more than two Eggs, and seldom fewer. The young ones cannot fly till they are almost full grown, but will run prodigiously fast; yet we have taken many of them."—Dampier, *New Voyage Round the World*, ed. 2, corrected, vol. i. p. 71, London, 1697.



The Flamingo.

It is, of course, only under very favorable circumstances that such nests as these can be built. When time or place is wanting, the hens seem to drop their eggs at random, as Mr. J. W. Clark was told they usually do at this day in the South of France (*Ibis*, 1870, p. 441), where a nest has not been seen for some years. Flamingoes are eminently gregarious. Their favorite resorts are salt-lakes—indeed, these may be said to be a prime necessity; and when, as often happens, they are diminished by drought, the birds have to take long flights in quest of new haunts. Thus some of the wanderers occasionally get separated from the main body, and appear in various unwonted spots. On the wing the Flamingo is described as presenting a singular appearance, its neck and legs being stretched out in a continuous straight line. When feeding or at rest, a flock of these birds, owing to their red plumage, has often been likened to a body of British soldiers. The young appear to be a long time in arriving at the full beauty of their plumage, and as the sexes are said to differ greatly in size, some of the difficulties which the determination of species in this genus presents may be excused. No fewer than four species of *Phœnicopterus* have been described as inhabiting the Old World. There is the large bird known to the ancients, Temminck's *P. antiquorum*, which certainly ranges from the Cape Verd Islands to the Caspian and to India, if not further. The *P. erythræus* of Jules Verreaux has been described as differing in its brighter plumage, and is supposed to be a native of Southern and Western Africa, but it is also said to have strayed to Europe. Then two smaller species (*P. minor*, Geoffroy, and *P. rubidus*, Feilden)—the one from Africa the other from India, have also been described, but whether their existence can be substantiated remains to be seen. Four species have likewise been indicated as belonging to the New World. There is first a large and very brilliantly-colored bird to which the Linnæan name *P. ruber*[2] has been continued, inhabiting suitable localities from Florida southwards to an undetermined latitude. To this species Mr. Salvin (*Trans. Zool. Soc.*, ix. p. 498) refers the *P. glyphorhynchus* of G. R. Gray, founded on a specimen from the Galapagos. Then there is the *P. chilensis* of Gmelin (*P. ignipalliatus* of later writers) which in coloring more resembles the European species, and is found in various parts of South America. Lastly comes the *P. andinus* of Philippi, which is easily distinguished from all others through the want of a back-toe, and was regarded by Bonaparte as meriting generic separation under the name of *Phœnicoparrus*. This appears to have its home on the salt-lakes of the elevated desert of Atacama.

The fossil remains of a Flamingo have been recognized from Lower and Middle Tertiary beds in France, and the species, which appears to have been very close to that commonly called *P. antiquorum*, has received the name of *P. croizeti* from Professor Gervais. But a more interesting discovery is that by Professor A. Milne-Edwards of no fewer than five species of an extinct form of *Phœnicopteridæ*, named by him *Palælodus* (*Ois. Foss. de la France*, ii. p. 58). These are from lacustrine deposits of the Miocene epoch. The same distinguished zoologist also refers to this family remains designated by him *Agnopterus*, and those of the "*Elornis*" (properly *Helornis*) of M. Aymard.

(A. N.)

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[1] By a mistake, it was before stated (BIRDS, vol. iii. p. 669) that the hen Flamingo "sits astride with dangling legs."

[2] Linnæus referred all the accounts of Flamingoes known to him to a single species, *P. ruber*. Here he was decidedly wrong, since those of the Old World and of the New are entirely distinct; but the reason for assigning this trivial name to one of the latter has yet to be explained by ornithologists.

FLAMININUS, Titus Quinctius, a Roman general and statesman, well known as the liberator of Greece, was born about 228, and died about 174 B. C. The patrician family of the Quinctii had already made their mark in Roman history, but of Titus's immediate ancestors nothing is known except that, according to the Fasti Capitolini, his father bore the same name. He began his public life as a military tribune under Marcellus. On the death of his commander he was appointed proprætor of Tarentum and the neighboring district. His administrative abilities were recognized even in this subordinate post, and in 202 B. C. he was appointed one of a commission of three to supplement the colony of Venuseum, whose numbers had been drained by the war with Hannibal. In 199 B. C. he was made quæstor, and the next year, skipping the regular stages of ædile and prætor, he obtained the consulship, notwithstanding the opposition of the tribunes on account of his youth. The scanty records of his early years furnish nothing which will adequately account for this marvellously rapid promotion, but it is explained and justified by his subsequent career. Flamininus was one of the first and most successful of the rising school of Roman statesmen, the opponents of the narrow and almost provincial patriotism of which Cato was the type, the disciples of Greek culture, and the advocates of a wide imperial policy. His winning manners, his polished address, his knowledge of men, and the personal fascination which was mainly owing to these qualities, and lastly his knowledge of Greek, which, according to Plutarch, he spoke like his native language, all marked him out as the fittest representative of Rome in the East, and it was an auspicious lot for Rome which assigned to the consul the province of Macedonia, and the conduct of the war with Philip. No sooner was he appointed than he set to work to collect new levies, selecting the picked veterans who had served in the Spanish and African campaigns. His predecessors in the province, Sulpicius and Publius, had been dilatory and incompetent, not quitting Rome till their year of office had nearly expired. Flamininus sailed in the early spring, and, leaving his troops at Corcyra to follow him, crossed in a single galley to the mainland and hurried to the Roman camp in Epirus, dismissed his predecessor Publius Vilius, and in a council of war determined to storm the pass of Antigonea, a narrow gorge a little below Clissoura, which was occupied by the enemy. Repulsed in the direct attack, he consented to parley with Philip, and the two commanders met on the banks of the Aous and conversed across the narrow stream. Flamininus at once revealed his intended policy, and in stern and uncompromising terms demanded the liberation of Greece and Thessaly. Philip indignantly broke up the conference, exclaiming that harder terms could not have been proposed to him had he been conquered. This bold attitude of defiance and assertion of the claims of oppressed nationalities was in a great measure the secret of Flamininus's success. The news soon spread that a Roman had come, not to transfer the yoke of slavery, but to vindicate the liberties of Greece. Charops, an Epirot chieftain, revealed to Flamininus a by-path across the mountains by which the pass could be turned; a signal fire showed that the expedition had succeeded; and a simultaneous attack in front and rear completely routed the Macedonians, who were only saved from total destruction by the nature of the ground, which rendered pursuit impossible. Flamininus found himself master of Epirus, and he cemented a lasting friendship with the Epirots by his mildness and moderation, which contrasted with the extortions and ravages of Philip. From Epirus he passed into Thessaly, and took Phaloria, though he was obliged to raise the siege of Atrax on the Peneus. Thence he marched into Locris, where Anticyra served him as a basis for further operations, and enabled him to communicate with the fleet, which was commanded by his brother Lucius. Many towns in Phocis opened their gates to him, and Elatea the capital was taken after a long resistance. His principal efforts were now directed to win over the Achæan league, and in this he was so far successful that a conference of the Greeks was held near Nicæa on the Meliac gulf, under his presidency, to treat with Philip. A truce of two months was agreed to, on condition of the evacuation of all the towns of Phocis and Locris, to enable both parties to send deputies to Rome. The Greek deputies were instructed to demand the expulsion of Macedonian garrisons from Demetrias, Chalcis, and Corinth, as the only guarantee for the freedom of Greece. When the senate demanded of Philip's ambassadors whether he was ready to grant these terms, they replied that they had no instructions, and were sent back and told to treat directly with Flamininus, whose command, which was just expiring, they extended for a second year. Flamininus having thus secured his own object, showed no disposition to temporize with Philip, and the negotiations were abruptly broken off. The perfidy of Nabis, the tyrant of Sparta, secured him a valuable ally and the help of Argos, which Philip had delivered over to Nabis to garrison. Thebes, and with it Bœotia, was gained over partly by persuasion and partly by stratagem, and in the ensuing spring, 197 B.C., Flamininus took the field with nearly all Greece at his back. After a cavalry skirmish near Pheræ, the main armies met at Cynoscephalæ, a low range of hills so called from a fanciful resemblance to dogs' heads. It was the first time that the Macedonian phalanx and the Roman legion had met in open fight, and the day decided which nation was to be master of Greece and perhaps of the world. It was a victory of intelligence over brute force, and where numbers and courage were equally matched, the superior strategy and presence of mind of the Roman general turned the scale. The left wing of the Roman army was retiring in hopeless confusion before the deep and serried ranks of the Macedonian right led by Philip in person, when Flamininus, leaving them to their fate, boldly charged the left wing under Nicanor, which was forming on the heights. The phalanx was like a steam hammer, irresistible if it hit its object, but moving only in one direction, and easily thrown out of gear. Before the left wing had time to form, Flamininus was upon them, and a massacre rather than a fight ensued. This defeat was turned into a general rout by a nameless tribune who collected twenty companies and charged in rear the victorious Macedonian phalanx, which in its pursuit had left the Roman right far behind. 8000 Macedonians were killed and 5000 taken prisoners, while the Romans lost only 700. Macedonia was now at the mercy of Rome, and Flamininus might have dictated what terms he liked, but he showed his usual moderation and farsightedness in disregarding the root-and-branch politics of his Ætolian allies, whose heads were turned by the part they had taken in the victory, and contenting himself with his previous demands. Philip lost all his foreign possessions, but retained his Macedonian kingdom almost entire. Such a valuable bulwark against the outer world of Thracians and Celts was not lightly to be removed. Ten commissioners arrived from Rome to regulate the final terms of peace, and at the Isthmian games which were celebrated at Corinth in the spring of 196 B.C. a herald proclaimed to the assembled crowds that "the Roman people, and T. Quinctius their general, having conquered King Philip and the Macedonians, declare all the Greek states which had been subject to the king henceforward free and independent." A shout of joy arose so loud that it was heard by the sailors in the harbor, and in Plutarch's time the legend told how birds flying over the course had dropped down stunned by the noise. The games were forgotten, and all crowded round the proconsul eager to kiss the hands of the liberator of Greece, who was almost smothered with chaplets and garlands. This day was indeed the climax of Flamininus's career, of which even the stately triumph that two years later he obtained at Rome must have seemed but a pale reflection.

Of the rest of his public life, which was mainly occupied in consolidating the fruits of the victory of Cynoscephalæ, we can only give the barest outline; but we will first attempt to estimate his work, and discuss how far he merited the proud title of benefactor of Greece, which Greeks and Romans alike bestowed on him. That he was animated by an ardent love of the Greek name and race, as genuine as that of Byron, of Canning, or of Kanaris, admits of no reasonable doubt. To attribute to Flamininus a Macchiavellian policy, as if he could have foreseen Corinth overthrown and Achaia turned into a Roman province, is not only disingenuous but absurd. There is more force in the charge which Mommsen brings against him, that his Hellenic sympathies prevented him from seeing the innate weakness and mutual jealousies of the Greek states of that period, whose only hope of peace and safety lay in submitting to the protectorate of the Roman republic. But if the event proved that the liberation of Greece was a political mistake, it was a noble and generous mistake, and reflects nothing but honor on the name of Flamininus.

The only military enterprise that remained after the conquest of Philip was to crush Nabis, who still held Argos, as well as his own tyranny of Sparta. In allowing the conquered tyrant to retain his native possessions, Flamininus was probably influenced by consideration for the Spartans, who would never, except under compulsion, have submitted to the Achæan league.

His last act before returning home is characteristic of the man. Of the Achæans, who vied with one another in showering upon him honors and rewards, he asked but one personal favor, the redemption of the Italian captives who had been sold as slaves in Greece during the Hannibalic war. These to the number of 1200 were presented to him on the eve his departure, and formed the chief ornament of his triumph.

In 192 B.C., on the rupture between the Romans and Antiochus, Flamininus returned to Greece, this time as the civil representative of Rome. His personal influence and skilful diplomacy secured the wavering Achæan states, cemented the alliance with Philip, and contributed mainly to the Roman victory of Thermopylæ. Chalcis and Naupactus, which had joined the enemy, owed their preservation to his interposition with the consul Glabrio. In 189 B.C. he was made censor. In this office his fair fame was sullied by an unseemly quarrel with Cato. Brotherly affection tempted him to shield from just punishment a dissolute and brutal ruffian. In 183 B.C., he undertook an embassy to Prusias, to induce the king of Bithynia to deliver up Hannibal. Hannibal forestalled his fate by taking poison, and his dying words justly stigmatized this pitiful victory over a defenceless and destitute old man. The only excuse for his conduct is that it was prompted not by wanton cruelty or love of revenge,—motives which were wholly alien to his character,—but by restless ambition and an inordinate love of glory, the infirmities of a truly noble nature. The history of his later years is a blank, and we only learn from his biographer Plutarch that his end was peaceful and happy. (F. S.)

FLAMINIUS, Caius, an eminent member of the plebeian gens Flaminia, who in the course of fifteen years of public life (232–217 B.C.) held successively the offices of tribune, prætor, and censor, and was twice advanced to the consular dignity. During his tribuneship (232 B.C.) he was successful in carrying a measure for distributing *viritim* among the plebeians, in terms of the Licinian law, the ager Gallicus Picenus, an extensive tract of newly-acquired territory lying along the east coast of the peninsula to the south of Ariminum. This law was carried in face of the determined opposition of the entire senatorial party, who, according to Valerius Maximus (lib. v. c. 4, sec. 5), at one stage threatened to declare him a public enemy and raise an army against him should he persevere in his agitation. In 227 B.C. he was appointed prætor, Sicily being assigned to him as his province; and there he so conducted himself as to win the lasting gratitude of the people whom he governed. This they took occasion to show thirty years afterwards when his son was curule ædile. In 223 B.C. he was made consul, and, along with his colleague P. Furius Philus, hastened at once to the north to prosecute the Gallic war, which had been occasioned, it is said, by the operation of his own agrarian law, and which had been going on with indecisive results since 225. Rashly crossing the Po near the site of Piacenza, he sustained a check which compelled him to capitulate. The facile Insubres having granted him a free retreat, he speedily, in conjunction with the Cenomani, renewed the attack at another point, perhaps on the river Oglio. On this occasion he was successful; but it seems very doubtful whether the victory was not gained in spite of rather than by means of the generalship of the consul. At all events his conquest of the Insubres failed to make any impression on the aristocratic party who had opposed his election and afterwards sought to obtain his recall; and the honors of a triumph were awarded to him only when the negative decision of the senate had been overborne by the popular voice. According to Plutarch (*Marcellus*, 4) he was nevertheless compelled to resign his office before the natural term had expired. In 221 he was chosen magister equitum under the dictatorship of M. Minucius Rufus, but was not permitted to take office owing to a bad omen—the squeaking of a shrew-mouse—which had occurred immediately after the election. In the following year (220 B.C.) he was censor; and this period of office was marked by the execution of two great public works which are permanently associated with his name—a circus and a road. The Circus Flaminius, erected in a locality which had previously been known as the Prata Flaminia, was designed for the accommodation of the plebeians, especially for their public meetings,—they having no right at that period to sit in the Circus Maximus. The Via Flaminia was the first to be carried across the Apennines, thus connecting the Adriatic and Tuscan seas. It was a continuation of the old military road which had been carried as far as to Spoletium (Spoleto) in 240 B.C. From Spoletium it went to Fulginium (Foligno) and Forum Flaminii (San Giovanni in Forifiamma); thence it mounted the Apennine slope to the station Ad Ensem (La Schieggia), crossing the central ridge at what is now known as the pass of Furlo, and descending by the valley of the Metaurus to Fanum Fortunæ (Fano), whence it kept the coast as far as to Ariminum. In 218 B.C., as a leader of the democratic opposition, Flaminius was one of the chief promoters of the measure brought in by the tribune Claudius, which prohibited senators and senators' sons from possessing sea-going vessels, except such as might be necessary for the transport of the produce of their own estates, and generally shut them out from everything which the Romans included under the category of commercial speculation (quæstus), such as undertaking public contracts (redemptiones), and the like. The effective support which he had given to this measure vastly increased the popularity of Flaminius with his own order, and secured his second election as consul in the following year (217 B.C.), shortly after the defeat of Sempronius at the Trebia. Without staying to go through the usual solemnities of installation at the Capitol, or to celebrate the feriæ Latinæ, Flaminius at once hastened to Ariminum and thence to Arretium, there to be ready for an aggressive campaign against Hannibal as soon as the roads should be open. Meanwhile Hannibal, uneasy in his winter quarters, had accomplished with comparative ease the passage of the Apennines, and forced his way southward across the flooded plains of the lower Arno. The consul, fearing lest the enemy should find Rome unprotected, impetuously set out in pursuit. Free to select his own ground, Hannibal chose to make his stand between Borghetto and Passignano, in the narrow defile formed by the hills of Cortona, which is closed at its entrance by the Trasimene lake. With the main body of his infantry he barred the further outlet at the hill of Torre, while the light troops and the cavalry were posted on the sides of the pass. It was early morning (on the 23d of June, according to the uncorrected calendar, but in reality on some day in April)[1] when Flaminius reached the spot, and a thick haze covering hill and lake altogether concealed the position and even the existence of the enemy, until the Roman army found itself completely and hopelessly surrounded in the fatal defile. In the three hours' carnage that followed 15,000 Romans perished, and Flaminius was among the slain.

From the materials which Livy and Polybius—no friendly critics—furnish, it is manifest that Flaminius was a man of ability, energy, and probity, who with the bravery of a true soldier combined many of the best qualities of a popular democratic leader. While eminent, however, as the head of a political party, and successful in carrying some pieces of useful legislation, he has little or no claim to rank among the greater statesmen of the republic. As a general, moreover, he was headstrong and self-sufficient, and he seems to have owed such victories as he achieved to personal boldness favored by good fortune rather than to any superiority of strategical skill (see Livy, xxi., xxii.; Polybius, ii., iii.).

FLAMINIUS, Caius, son of the preceding, was quæstor under P. Scipio Africanus the elder in Spain in the year 210 B.C., and took part in the capture of New Carthage. Fourteen years later he was curule ædile; and this term of office was marked by the distribution among the citizens at very low prices of large quantities of grain, which in a time of Roman scarcity the Sicilians had sent in grateful remembrance of his father's prætorship thirty years before. In 193 B.C. he himself attained a prætorship, and was sent to the recently constituted province of Hispania Citerior. There he carried on the war against the insubordinate populations, and after a siege took Litabrum, a city which is described by Livy as having been strong and opulent, and made prisoner Corribilo, a powerful chieftain. In 187 B.C. he became consul along with M. Æmilius Lepidus, and was successful in giving peace to Northern Italy by the subjugation of the warlike Ligurian tribes. In the same year the branch of the Via Æmilia (traces of which are still discernible) connecting Bononia (Bologna) with Arretium (Arezzo) was constructed by him.

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[1] See Mommsen, *History of Rome*, vol. ii. p. 122 (note), London, 1864

FLAMSTEED, John, (1646–1719), the first astronomer-royal of England, was born at Denby near Derby, August 14, 1646. He was educated at the free school of that town, where his father carried on business as a maltster. He began the study of mathematics and astronomy while still very young, and showed considerable ingenuity in the construction of mathematical instruments. At the age of fourteen he caught cold while bathing, and he suffered during the rest of his life from a rheumatic affection of the joints. In 1665 he went to Ireland to consult Greatrakes, a notorious quack of the period, who claimed to be able to cure such diseases by manipulation; but he returned to Derby uncured. He continued his astronomical studies here till 1669. About the year 1667 he wrote an able paper on the equation of time, afterwards appended by Wallis to his edition of Horrocks's works. In 1669 he communicated a paper to the Royal Society under the assumed name J. Mathesin a sole fundes, an anagram on his own name Johannes Flamsteedius; but Oldenburg, the secretary, addressed a reply to him, showing that he was discovered, and from that time Flamsteed corresponded with many men of science. Sir Jonas Moore, whose acquaintance he made in 1670 when visiting London, furnished him with several instruments, amongst others with Townly's micrometer. In 1673 Flamsteed composed his treatise on *The true and apparent Places of the Planets when at their greatest and least Distances from the Earth*, a work referred to by Newton in the first edition of his *Principia*. In the same year he obtained his M.A. degree at Cambridge. He does not appear to have ever studied at Cambridge, though his name was entered at Jesus College in 1670, and he resided there for some months in 1674. In this year he published his *Ephemeris*, and drew up a table of the tides. Sir J. Moore at this time proposed to establish Flamsteed in a private observatory at Chelsea; but Charles II., whose attention had been directed to the necessity of improved astronomical tables by a proposal for finding the longitude at sea, determined to establish an observatory, and Flamsteed was appointed "astronomical observator." His observations were made at the queen's house in Greenwich Park, till July, 1676, when the observatory was ready. Of his work as astronomer-royal an account will be found under Astronomy (vol. ii. p. 660). Baily dates the commencement of modern astronomy from the year 1676, when Flamsteed began his observations.

Flamsteed was ill-paid and overworked in his new office. A salary of £100 a year was paid him, and he was left to provide his own instruments. Until 1684 he had to teach two boys from Christ's Hospital, as one of the duties of his post; and he taught other boys, to defray the expenses he incurred for instruments. In 1684 his father died, and he was presented by Lord Keeper North to a small living. His means being thus somewhat improved, he resolved to incur the expense of a mural arc, on the assurance of Government that he would be reimbursed,—a promise which, however, was never fulfilled.

Attention has been drawn since the year 1832 to certain private affairs of Flamsteed's. In that year Francis Baily discovered a large collection of Flamsteed's letters in private hands, and others letters afterwards at Greenwich. The Admiralty unfortunately decided to print these at the public expense. For some it was supposed that the fair fame of Newton and Halley had been darkened by the publication of these documents. But Sir David Brewster discovered among Newton's papers a series of letters and papers completely exculpating Newton and Halley from charges affecting their honor, and placing Flamsteed's character in an unfavorable aspect. It must be remembered, however, that the case made out by Brewster against Flamsteed, and the case made out by Baily against Newton and Halley, both rest on *ex parte* statements. The conclusion to which a careful investigation of both sides of the story appears to point is that both Newton and Flamsteed showed exceeding ill-temper, and that the charges affecting the honor of either (and of Halley as Newton's friend) had their origin entirely in the ill-feeling thus excited. It is unfortunate that the matter should ever have been opened. Let it be remembered only that, while on the one hand Flamsteed furnished Newton with every lunar observation made before 1685, when the first edition of the *Principia* appeared, Newton on the other hand based on these observations the noblest theory the world of science has known.

From 1715 to 1719, the year of his death, Flamsteed superintended the publication of the *Historia Cœlestis*, but the publication was not completed till 1723. His valuable *Atlas Cœlestis* was not published till 1753. The well-known British catalogue of 2884 stars appears in the third volume of the *Historia Cœlestis*. Though of feeble constitution, Flamsteed attained the age of seventy-three, his death occurring on the last day of the year 1719. He was succeeded in the office of astronomer-royal by Halley.

FLANDERS (German *Flandern*, Dutch *Vlaendern*), an ancient countship of the Low Countries, which has left its name to two provinces of the modern kingdom of Belgium, distinguished as East and West. It took its rise about the time of Charles the Great, but the early history of the line of counts is far from certain, the older chronicles giving very different statements. Leaving out of view those mythical personages through whom as a matter of course a connection is established with Priam of Troy, we find the founder of the family of the Foresters, as they are called, in a certain Lideric le Buc, "only son of Saluart prince of Dijon, and of Madame Eringarde daughter of Gerard lord of Roussillon," who, says Lambert, canon of St. Omer, "videns Flandriam vacuam et incultam ac memorosam, occupavit eam." Even Lideric is of doubtful authenticity, though his death in 836 is mentioned in the *Annales Blandinienses*, which were compiled before 1064 from earlier documents. His son Ingelramn, say the chronicles, had a son Audacer; but according to several modern investigators Audacer was merely a cognomen of Baldwin, the next person in the genealogical series. With Baldwin, who is distinguished as *Bras de Fer* or *Iron Arm*, we at length reach the *terra firma* of history. He was a strong, daring, and unscrupulous man, and made noise enough in his own day, more particularly by carrying off and marrying Judith daughter of Charles the Bald of France, a lady of easy principles, who had already been the wife of Æthelwulf of the West Saxons of England, and for a time of Æthelwulf's son Æthelbald. Baldwin II., the Bald, born of this marriage, is mainly remembered as a vigorous opponent of the Normans, and as the builder of the walls of Bruges and Ypres. It is said that he also laid the foundation of the political liberties of his country by appointing twelve of his principal vassals as a council of state. He took to wife Ælfthryth, daughter of King Alfred of England. On his death in 918, his possessions were divided between his two sons Arnulf the Elder and Adolphus; but the latter survived only a short time, and Arnulf succeeded to the whole inheritance. His reign was full of troubles, with the Normans on the one hand, and with the emperor Otho I. on the other; and he made one of his conferences memorable by murdering William Longsword the Norman duke. In his old age he placed the government in the hands of Baldwin, his son by Adela daughter of the count of Vermandois, and the young man, though his reign was a very short one, did a great deal for the commercial and industrial progress of the country, establishing the first weavers and fullers of Ghent, and instituting yearly fairs at Ypres, Bruges, Veurne, Cassel, Courtrai, Thorout, and Rousselare. On Baldwin's death in 961 the old count resumed the control, and spent the few remaining years of his life in securing the succession of his grandson Arnulf or Arnold the younger. The reign of Arnulf was terminated by his death in 989, and he was followed by his son Baldwin IV., styled *Pulchra Barba*, Comely Beard, or simply *Barbatus*, Met den Baerd, With the beard. This Baldwin fought successfully both against the king of France and the emperor Henry II., and obtained from the latter Valenciennes, Walcheren, and the islands of Zealand. The counts of Flanders thus became feudatories of the empire as well as of France. Baldwin's son Baldwin V., surnamed of Lille (in Latin Insularius, in Dutch Van Ryssel), rebelled in 1028 against his father, at the instigation of his wife Adela, daughter of Robert of France; but two years later peace was sworn at Oudenarde, and the old man continued to reign till his death in 1036. Baldwin V. proved a worthy successor, and acquired from the people the title of Debonnaire. He was an active, ambitious, enterprising man, and greatly extended his power by wars and alliances. Before his death he saw his eldest daughter Matilda sharing the English throne with William the Conqueror, his son Baldwin of Mons (in Dutch Bergen) in possession of Hainault in right of his wife Richilde the widow of the late count, and his son Robert the Frisian ruling over the countship of Holland and Friesland in right of the countess Gertrude. His younger daughter Judith had married Tostig, brother of Harold IV. of England. On his death in 1067, Baldwin of Mons succeeded to the countship of Flanders, apparently without opposition on the part of Robert his elder brother; but a few years afterwards a quarrel broke out, and Baldwin was slain. Robert now claimed the tutelage of Baldwin's children, and obtained the support of the emperor Henry IV.; while Richilde, Baldwin's widow, appealed to Philip of France. The contest was decided at Ravenchoven, near Cassel, February 22, 1071, where Robert was victor, and Arnulf III., Baldwin's son, was slain. Arras, Douai, Tournai, and other towns of French Flanders had taken part with the countess and the French, while Ghent, Bruges, Ypres, Courtrai, and other towns of Flanders proper were on the side of Robert. The successful competitor held the countship till his death in 1093, when he was succeeded by his son Robert II., who became famous for his exploits in the first crusade, and acquired the title of Lance and Sword of Christendom. Baldwin VII., surnamed À la Hache, or with the Axe, became count on Robert's death in 1119, and in his turn transmitted the dignity to his cousin Charles of Denmark, son of Canute and Adelais, daughter of Robert the Frisian. This Charles of Denmark was a religious enthusiast, and exercised his authority against all swearers, necromancers, Jews, and usurers. At Bruges in 1127 he ordered all the granaries to be thrown open; and the merchants who had expected to make gain by the dearth were so enraged that they formed a conspiracy and procured his assassination in the church of St. Donat. No fewer than six pretenders to the countship now appeared, and among the rest William Clito, son of Robert Courthose of Normandy, and Thierri or Theodoric of Alsace. The latter was the successful competitor, and he married the widow of Count Charles, Marguerite of Clermont. He distinguished himself at home by the wise encouragement which he gave to the growth of popular liberty, and abroad by the part which he took in several crusading expeditions. In the latter years of his life he retired to Gravelines, leaving the cares of state to his son Philip, who, when he came to rule in his own name, followed in his father's footsteps, and acquired the honorable reputation of "the greatest lawgiver of Flanders." He married Elizabeth of Vermandois, and on her death had a violent dispute with the French monarch about the possession of Vermandois, which was ultimately granted him during his life. As he had no children, his inheritance went to Baldwin of Hainault, who had married his sister Marguerite,—a change of the dynasty which considerably affected the relations of Flanders with France. The French king laid claim to the countship, and Baldwin was constrained to cede Artois, St. Omers, Lens, Hesdin, and a great part of southern Flanders to France, and to allow Matilda of Portugal, the widow of Philip, to hold Lille, Cassel, Veurne, Rille, and Sluys. Marguerite died in 1194 and Baldwin in 1195, and the countship devolved on their son Baldwin IX., who became the founder of the Latin empire at Constantinople, and perished in Bulgaria in 1206. The emperor's two daughters were both under age, and accordingly the government of Flanders and Hainault was entrusted to his brother Philip, assisted by Bosschaert of Avesnes and William of Hainault. Johanna the elder daughter was married to Ferdinand or Ferrand of Portugal, but left no heir; and so the inheritance of both Flanders and Hainault passed on her death in 1279 to the children of the younger, Margaret—the latter to John her eldest son by her first marriage with Bosschaert of Avesnes, and the former to Guy of Dampierre, a son of her second marriage with William of Dampierre, a French nobleman. The government of Guy proved an unfortunate one: Flanders was involved in a severe struggle with France, and for a time almost lost its independence. The old count died at Compiègne in prison about two months after peace was concluded in 1305; and Robert of Bethune, his son, was acknowledged his successor both by the Flemings and by the French. Robert was an able and valiant prince, and has the honor of having established at Bruges the first insurance company. The reign of his grandson and successor Louis of Nevers and Rethel, who had been brought up at the French court and married to Margaret the French king's daughter, was rendered for ever memorable by the enterprise of Jacob van Artevelde, the great hero of Flemish liberty. Louis perished in the battle of Crecy, and left his county to his son Louis II. of Male, near Bruges, under whom the struggle of the Flemish towns for their liberties was maintained. By the marriage of Louis's daughter Margaret with Philip of Burgundy, the lordship of Flanders passed to the Burgundian family; and thus it ultimately became part of the possessions of the house of Austria. The title of count of Flanders has been borne since 1840 by the second son of Leopold I. of Belgium, Philip Eugene Ferdinand.

See "Genealogia comitum Flandriæ edente D. L. C. Bethmann," in *Monumenta Germaniæ Historica Scriptorum*, vol. ix.; "Genealogie der Grafen von Flandern, Sachsische Weltchronik, Anhang vi." in *Mon. Germ. Hist. Scriptorum qui vernacula lingua usi sunt Tomus II.*; Vredius, *Historia Comitum Flandriæ*, 1650–1652, Van Praet, *Histoire dé la Flandre*, 2 vols., 1828; Le Glay, *Histoire des Comtes de Flandre*, 2 vols., 1843–4; Warnkönig, *Flandrische Staats- und Rechtsgeschichte bis 1306*, 3 vols., 1835–1839; Hendrik Conscience, *Geschiedenis van Belgie*, 1845; F. G. Stephens, *Flemish Relics*, 1866; Kervyn van Lettenhove, *Histoire de Flandre*, 4 vols., 1874; Frédéricq, *Rôle politique et social du duc de Bourgogne dans les Pays-Bas*, 1875.

FLANDRIN, Jean Hippolyte (1809-1864) French painter, was born at Lyons in 1809. His father, though brought up to business, had great fondness for art, and sought himself to follow an artist's career. Lack of early training, however, disabled him for success, and he was obliged to take up the precarious occupation of a miniature painter. Hippolyte was the second of three sons, all painters, and two of them eminent, for the third son Paul is one of the leaders of the modern landscape school of France. Auguste, the eldest, passed the greater part of his life as professor at Lyons, where he died in 1840. After studying for some time at Lyons, Hippolyte and Paul, who had long determined on the step and economized for it, set out to walk to Paris in 1829, to place themselves under the tuition of Hersent. They chose finally to enter the atelier of Ingres, who became not only their instructor, but their friend for life. At first considerably hampered by poverty, Flandrin's difficulties were for ever removed by his taking, in 1832, the Grand Prix de Rome, awarded for his picture of the Recognition of Theseus by his Father. This allowed him to study five years at Rome, whence he sent home several pictures which considerably raised his fame. St. Clair Healing the Blind was done for the cathedral of Nantes, and years after, at the exhibition of 1855, brought him a medal of the first class. Jesus and the Little Children was given by the Government to the town of Lizieux. Dante and Virgil visiting the Envious Men struck with Blindness, and Euripides writing his Tragedies, belong to the Museum at Lyons. Returning to Paris through Lyons in 1838 he soon received commission to ornament the chapel of St. John in the church of St. Séverin at Paris, and reputation increased and employment continued abundant for the rest of his life. Besides the pictures mentioned above, and others of a similar kind, he painted a great number of portraits. The works, however, upon which his fame most surely rests are his monumental decorative paintings. Of these, the principal are those executed in the following churches:—in the sanctuary of St. Germain des Prés at Paris (1842–44), in the choir of the same church (1846–48), in the church of St. Paul at Nismes (1848–49), of St. Vincent de Paul at Paris (1850–54), in the church of Ainay at Lyons (1855), in the nave of St. Germain des Prés (1855–61). In 1856 Flandrin was elected to the Académie des Beaux-Arts. In 1863 his failing health, rendered worse by incessant toil and exposure to the damp and draughts of churches, induced him again to visit Italy. He died of small-pox at Rome on the 21st March, 1864. As might naturally be expected in one who looked upon painting as but the vehicle for the expression of spiritual sentiment, Flandrin had perhaps too little pride in the technical qualities of his art. There is shown in his works much of that austerity and coldness, expressed in form and color, which springs from a faith which feels itself in opposition to the tendencies of surrounding life. He has been compared to Fra Angelico (see FIESOLE); but the faces of his long processions of saints and martyrs seem to express rather the austerity of souls convicted of sin than the joy and purity of never-corrupted life which shines from the work of the early master.

See Delaborde, *Lettres et Pensées de H. Flandrin*, Paris, 1864.

FLANNEL (French *flanelle*, German *Flanel*), an open woollen stuff of various degrees of fineness, from patent flannel, which does not shrink in washing, to baize, which is a coarse woollen stuff, or flannel with a long nap, first introduced into England, together with serge, by the Flemings. Domett is another variety of flannel, the warp of which is made of cotton, and the woof of wool. It is very thin, and is used for linings and for shrouds for coffins. The manufacture of flannel is almost the same as that of other woollen goods, though there are certain wools which are more used for flannel than for any other textiles. For instance, a short staple wool of fine quality from a Southdown variety of the Sussex breed is principally in favor with the flannel-makers at Rochdale, as also the wool from the Norfolk breed, a cross between the Southdown and Norfolk sheep. In Wales the short staple wool of the mountain sheep is used, and in Ireland that of the Wicklow variety of the Cottagh breed. Nearly 2000 persons are employed in this section of woollen manufactures, the chief seat of the industry being Rochdale in Lancashire, while blankets, a special branch of the flannel trade, are extensively woven at Dewsbury in Yorkshire. The wool for these is chiefly obtained from the coarse staples of the Mysore breed in India. Nearly the whole population at Llanidloes and Newton, in Montgomeryshire, finds occupation in flannel weaving, the Welsh flannels having attained a very high reputation. It is also manufactured at Rathdrum, Wicklow, Ireland.

A very considerable trade is carried on by England in flannel, as is shown by the exports for the year 1877, viz:—

	Yards.	Value.
Germany	121,490	£9,167
South Africa	389,834	21,389
Bombay and Scinde	325,510	14,436
Bengal and Burmah	522,080	23,372
Hong Kong	162,640	9,435
Japan	147,760	9,061
Australia	5,817,700	291,451
British North America	1,189,170	50,888
Other countries	597,245	32,193
Total	9,273,429	£466,392

Flannel is highly recommended by medical men as a clothing, both in hot and cold countries, from its properties of promoting insensible perspiration, which, being absorbed by the material, is immediately distributed through the whole thickness of the substance, and thus exposed over a very large surface, to be carried off by the atmosphere. Dr. Black assigns as a reason why flannel and other substances of the same kind keep the body warm, that they compose a rare and spongy mass, the fibres of which touch each other so lightly that the heat moves slowly through the interstices. These being filled up with air, and that too in a stagnant state, give little assistance in conducting the heat.

FLATBUSH, a town of the United States, situated in Kings County, Long Island, New York, about 5 miles from Brooklyn, with which it is connected by tramway lines. Besides the churches, the principal public buildings are an educational institution known as Erasmus Hall, the town-hall, and the county almshouse, hospital, and lunatic asylum. The older houses are noticeable for their palatial style, and the native population is largely of Dutch descent. The battle of Long Island was fought in the neighborhood, August, 1776. Population in 1860, 3471; in 1870, 6309.

FLAT-FISH (*Pleuronectidæ*) is the name common to all those fishes which swim on their side, as the holibut, turbot, brill, plaice, flounder, sole, etc. The side which is turned towards the bottom, and in some kinds is the right in others the left, is generally colorless, and called "blind," from the absence of an eye on this side. The opposite side, which is turned upwards and towards the light, is variously, and in some tropical species even vividly, colored, both eyes being placed on this side of the head. All the bones and muscles of the upper side are more strongly developed than on the lower; but it is noteworthy that these fishes when hatched, and for a short time afterwards, are symmetrical like other fishes, swimming with the body in a vertical position, and. having the eyes placed normally, viz., one on the right and the other on the left side With advancing growth one of the eyes is gradually pushed to the opposite side, and the fish assumes its horizontal position in the water. Flat fishes are bottom-fish, rarely rising to the surface, and apparently not descending to very great depths. They are found in all seas, except perhaps the highest latitudes. More than 200 species are known; they are most numerous towards the equator, whilst those of the largest size (holibut) occur in the temperate and cold regions. Some enter fresh water freely, like the flounder. The size and abundance of the flat-fish, and the flavor of their flesh, render this family one of the most useful and economically important. See ICHTHYOLOGY.

FLAVEL, JOHN (*c.* 1627–1691), an English nonconformist divine, was born at Bromsgrove in Worcestershire, probably in 1627. He was the elder son of Mr. Richard Flavel, described in contemporary records as "a painful and eminent minister." After receiving his early education, partly at home, and partly at the grammar-schools of Bromsgrove and Haslar, he entered University College, Oxford. Soon after taking orders in 1650, he obtained a curacy at Deptford, and on the death of the vicar he was appointed to succeed him. From Deptford he removed in 1656 to Dartmouth. He was ejected from his living by the passing of the Act of Uniformity in 1662, but continued to preach and administer the sacraments privately till the Oxford Act of 1665, when he retired to Slopton, five miles from the scene of his official labors. After the expulsion of the Stuart dynasty, he became minister of a nonconformist church at Dartmouth, where he labored till his death in 1691. Although the writings of Flavel now appear cumbrous in structure, yet their literary style has some merits; and from their tender and devotional character they were long popular with a certain class of readers.

His principal works are his *Treatise on the Soul of Man; The Fountain of Life, in forty-two Sermons; The Method of Grace; A Token for Mourners; Husbandry Spiritualized;* and *Navigation Spiritualized.* A new edition of his collected works was published in 1820 in 6 vols., 8vo. His select works were published in 1823 in 2 vols., and an edition of these, with life, in 1833.

FLAVIAN I., patriarch of Antioch, was born about 320, most probably in Antioch. He lost his parents in early youth, and, although inheriting great wealth, he renounced a life of worldly ease, and resolved to devote his riches and his talents to the service of the church. In association with Diodorus, afterwards bishop of Tarsus, he supported the catholic faith against the Arian Leontius, who had succeeded Eustathius as patriarch of Antioch. The two friends assembled their adherents outside the city walls for the observance of the exercises of religion; and, according to Theodoret, it was in these meetings that the practice of antiphonal singing was first introduced in the services of the church. When Meletius was appointed patriarch of Antioch in 361, he raised Flavian to the priesthood, and on the death of Meletius in 381, Flavian was chosen, by a majority of the bishops, to succeed him. The schism between the two parties was, however, far from being healed, and Paulinus, who by the extreme Eustathians had been elected patriarch in opposition to Meletius, still exercised authority over a portion of the church. On the death of Paulinus in 383, Evagrius was chosen as his successor, and after the death of Evagrius in 395 the Eustathians still continued to hold separate meetings; but through the intervention of Chrysostom of Constantinople, they agreed, about the year 399, to acknowledge Flavian as their bishop. During the patriarchate of Flavian a serious sedition occurred in the streets of Antioch (387), and the statues of Theodosius and the empress were overturned; but Flavian went to Constantinople, and by an eloquent discourse, prepared for him, it is said, by his pupil St. John Chrysostom, succeeded in averting the emperor's vengeance from the city. Flavian died in 404.

FLAVIAN II., patriarch of Antioch, was chosen by the emperor Anastasius I. to succeed Palladius, most probably in 498. He endeavored to please both parties by steering a middle course in reference to the Chalcedon decrees, but was induced after great hesitation to agree to the request of Anastasius that he should accept the Henoticon. His doing so, while it brought upon him the anathema of the patriarch of Constantinople, failed to secure a return of the favor of Anastasius, who in 511 found in the riots which were occurring between the rival parties in the streets of

Antioch a pretext for deposing Flavian, and banishing him to Petra, where he died in 518. Flavian was soon after his death enrolled among the saints of the Greek Church, and after some opposition he was also canonized by the Latin Church.

FLAVIAN, patriarch of Constantinople, succeeded Proclus in 447. He presided at the council which deposed Eutyches in 448, but in the following year he was deposed by the council of Alexandria, which reinstated Eutyches in his office. Not satisfied with the mere deposition of Flavian, his opponents were so carried away by their feelings as to proceed to personal violence, and his death soon after at Hypæpa in Lydia is attributed to a kick inflicted on him by Dioscorus, patriarch of Alexandria, the president of the council. The council of Chalcedon canonized him as a martyr, and he is also enrolled in the martyrology of the Latin Church, his day being the 18th February.

FLAVIGNY, VALERIEN, was born near Laon about the beginning of the 17th century. Having studied in the college of Sorbonne, he received from it his doctor's diploma in 1628, and shortly afterwards obtained a canonry in the cathedral of Rheims. In 1630 he became professor of Hebrew in the college of France. He died at Paris, 29th April, 1674. The works of Flavigny are chiefly occupied with discussions regarding the Hebrew text of the Bible. His opinions acquired him for a time considerable celebrity, and engaged him in controversies with some of the doctors of the Sorbonne, but now possess scarcely any interest.

The following are his principal treatises:—*Epistolæ IV. de ingenti Bibliorum opere septemlingui*, 1636; *Epistolæ duæ in quibus de ingenti Bibliorum opere quod nuper Lutetiæ Parisiorum prodiit*, etc., 1646; *Epistola III*^{a} *in qua de libello Ruth Syriaco, quem Abr. Echellensis insertum esse voluit ingenti Bibliorum operi*, 1647; *Epistola adversus Abr. Echellensem de libello Ruth*, etc., 1648; *Disquisitio Theologica*, etc., 1666. He also published an edition of the works of William of Saint-Amour, a doctor of the 13th century.

FLAVIN is an extract or preparation of quercitron bark (*Quercus tinctoria*), used as a yellow dye in place of the ground and powdered bark. Flavin is not a definite chemical compound, and the commercial product is found to vary greatly in composition and tinctorial value, according, probably, to the nature of the varied processes employed in its preparation. The manufacture of flavin is principally carried on in the United States under various patents; and while some kinds appear to be little other than finely powdered and sifted bark, others are almost pure quercitrin, the chemical principle peculiar to quercitron bark. A kind of flavin made in England is obtained by exhausting the bark in a weak alkaline solution, and precipitating the coloring matter by neutralization with either sulphuric acid or hydrochloric acid. Flavin of good quality ought to possess about 16 times the tinctorial strength of the bark from which it is extracted.

FLAX. The terms flax or lint (German *Flachs*, French *Lin*, Latin *Linum*) are employed at once to denote the fibre so called, and the plant from which it is prepared. The flax plant (*Linum usitatissimum*) belongs to the natural order *Linaceæ*, and like most plants which have been long under cultivation, it possesses numerous varieties, while the wild or parent condition is not known. As cultivated it is an annual with an erect stalk rising to a height of from 20 to 40 inches, with alternate, sessile, linear-lanceolate leaves, branching only at the top into a corymbose panicle of bright blue flowers. The flowers are regular and symmetrical, having five ovate-acute, slightly ciliate sepals, five deciduous petals, and a syncarpous pentacarpellary ovary with five distinct styles. The fruit or boll is round, containing five cells or loculaments, each of which is divided into two by a spurious dorsal dissepiment, thus forming ten divisions, each of which contains a single seed. The seeds, well known as linseed, are flat, oval in form, dark brown in color, with a smooth shining mucilaginous coat, and flat oily cotyledons. There are several other species which have been and are cultivated to an inconsiderable extent as sources of fibre, as the Greek or spring flax (*L. crepitans*) Siberian flax (*L. perenne*), and the white blossomed or purging flax (*L. catharticum*), all grown in certain parts of Austria, and the narrow-leaved flax (*L. angustifolium*), which was utilized at a very remote period.

The cultivation and preparation of flax are the most ancient of all textile industries, very distinct traces of their existence during the stone age being preserved to the present day. "The use of flax," says Keller (*Lake Dwellings of Switzerland*, translated by J. E. Lee), "reaches back to the very earliest periods of civilization, and it was most extensively and variously applied in the lake dwellings even in those of the stone period. But of the mode in which it was planted, steeped, heckled, cleansed, and generally prepared for use, we can form no idea, any more than we can of the mode or tools employed by the settlers in its cultivation. . . . Rough or unworked flax is found in the lake dwellings made into bundles, or what are technically called heads, and, as much attention was given to this last operation, it was perfectly clean and ready for use." As to its applications at this early period, Keller remarks—"Flax was the material for making lines and nets for fishing and catching wild animals, cords for carrying the earthenware vessels and other heavy objects; in fact one can hardly imagine how navigation could be carried on, or the lake dwellings themselves be erected, without the use of ropes and cords; and the erection of memorial stones (menhirs, dolmens) at whichever era, and to whatever people these monuments may belong, would be altogether impracticable without the use of strong ropes." As to the variety of flax cultivated by the prehistoric races, Dr. Heer is of opinion that it was the small-leaved flax (*Linum angustifolium*), a plant native of the Mediterranean coasts from Greece and Dalmatia to the Pyrenees.

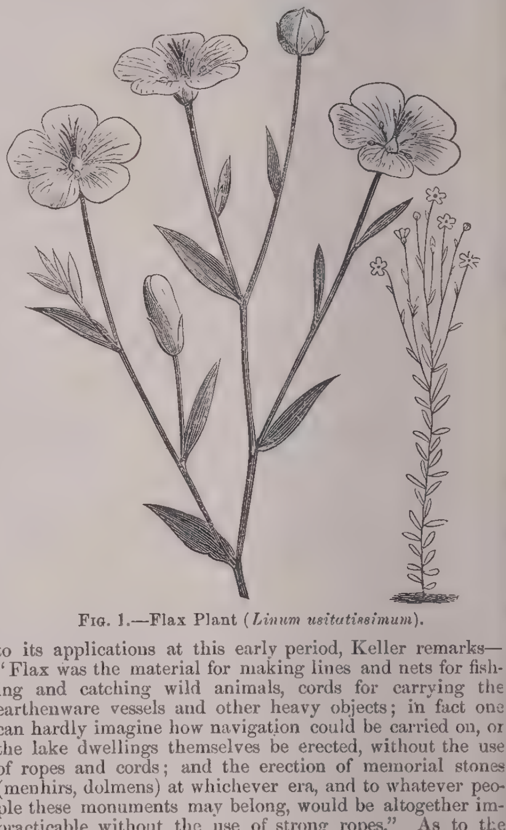

FIG. 1.—Flax Plant (*Linum usitatissimum*).

That flax was extensively cultivated and was regarded as of much importance at a very early period in the world's history there is abundant testimony. Especially in ancient Egypt the fibre occupied a most important place, linen having been there not only generally worn by all classes, but it was the only material the priestly order was permitted to wear, while it was most extensively used as wrappings for embalmed bodies and for general purposes. In the Old Testament we are told that Pharaoh arrayed Joseph "in vestures of fine linen" (Gen. xlii. 42), and among the plagues of Egypt that of hail destroyed the flax and barley crops, "for the barley was in the ear, and the flax was bolled" (Exod. ix. 31). Further, numerous pictorial representations of flax culture and preparation exist to the present day on the walls of tombs and in Egypt. Sir J. G. Wilkinson in his description of ancient Egypt shows clearly the great antiquity of the ordinary processes of preparing flax. "At Beni Hassan," he says, "the mode of cultivating the plant, in the same square beds now met with throughout Egypt (much resembling our salt pans), the process of beating the stalks and making them into ropes, and the manufacture of a piece of cloth are distinctly pointed out." The preparation of the fibre as conducted in Egypt is illustrated by Pliny, who says—"The stalks themselves are immersed in water, warmed by the heat of the sun, and are kept down by weights placed upon them, for nothing is lighter than flax. The membrane, or rind, becoming loose is a sign of their being sufficiently macerated. They are then taken out and repeatedly turned over in the sun until perfectly dried, and afterwards beaten by mallets on stone slabs. That which is nearest the rind is called *stupa* ['tow'], inferior to the inner fibres, and fit only for the wicks of lamps. It is combed out with iron hooks until the rind is all removed. The inner part is of a whiter and finer quality. Men are not ashamed to prepare it" (Pliny, *N. H.*, xix. 1). For many ages, even down to the early part of the 14th century, Egyptian flax occupied the foremost place in the commercial world, being sent into all regions with which open intercourse was maintained. Among Western nations it was, without any competitor, the most important of all vegetable fibres till towards the close of the 18th century, when, after a brief struggle, cotton took its place as the supreme vegetable fibre of commerce.

Flax, as a field crop, having been described under the heading AGRICULTURE (see vol. i. p. 337), it is unnecessary to dwell here on that feature of the subject. When flax is cultivated primarily on account of the fibre, the crop ought to be pulled before the capsules are quite ripe, when they are just beginning to change from a green to a pale brown color, and when the stalks of the plant have become yellow throughout about two-thirds of their height. The various operations through which the crop passes from this point till flax ready for the market is produced are—(1) pulling, (2) rippling, (3) retting, and (4) scutching.

Pulling and *rippling* may be dismissed very briefly. Flax is always pulled up by the root, and under no circumstances is it cut or shorn like cereal crops. The pulling ought to be done in dry clear weather; and care is to be taken in this, as in all the subsequent operations, to keep the root-ends even, and the stalks parallel. At the same time it is desirable to have, as far as possible, stalks of equal length together,—all these conditions having considerable influence on the quality and appearance of the finished sample. As a general rule the removal of the "bolls" or capsules by the process of *rippling* immediately follows the pulling, the operation being performed in the field; but under some systems of cultivation, as, for example, the Courtrai method, alluded to below, the crop is made up into sheaves, dried, and stacked, and is only bolled and retted in the early part of the next ensuing season. The best rippler, or apparatus for rippling, consists of a kind of comb having, set in a wooden frame, iron teeth made of round-rod iron three-sixteenths of an inch asunder at the bottom, and half an inch at the top, and 18 inches long, to allow a sufficient spring, and save much breaking of flax. The points should begin to taper 3 inches from the top. A sheet or other cover being spread on the field, the apparatus is placed in the middle of it, and two ripplers sitting opposite each other, with the machine between them, work at the same time. It is unadvisable to ripple the flax so severely as to break or tear the delicate fibres at the upper part of the stem. The two valuable commercial products of the flax plant, the seeds and the stalk, are separated at this point. We have here to do with the latter only.

Retting or *rotting* is an operation of the greatest importance, and one in connection with which in recent years numerous experiments have been made, and many projects and processes put forth, with the view of remedying the defects of the primitive system or altogether supplanting it. From the earliest times two leading processes of retting have been practised, termed respectively water-retting and dew-retting; and as no method has yet been introduced which satisfactorily supersedes these operations, they will first be described.

Water-retting.—For this—the process by which flax is generally prepared—pure soft water, free from iron and other materials which might color the fibre, is essential. Any water much impregnated with lime is also specially objectionable. The dams or ponds in which the operation is conducted are of variable size, but should be not more than 4 feet in depth. It is calculated that a dam 50 feet long, 9 feet broad, and 4 feet deep is sufficient to ret the produce of an acre of flax. The rippled stalks are tied in small bundles and packed, roots downwards, in the dams till they are quite full; over the top of the upper layer is placed a stratum of rushes and straw, or sods with the grassy side downwards, and above all stones of sufficient weight to keep the flax submerged. Under favorable circumstances a process of fermentation should immediately be set up, which soon makes itself manifest by the evolution of gaseous bubbles. After a few days the fermentation subsides; and generally in from ten days to two weeks, the process ought to be complete; but everything depends upon the weather; and as the steeping is a critical operation, it is essential that the stalks be frequently examined and tested as the process nears completion. When it is found that the fibre separates readily from the woody "shive" or core, the beets or small bundles are ready for removing from the dams. It is next spread, evenly and equally, over a grassy meadow, where it is left for about a fortnight, at the end of which time the fibres will have partly separated from the core and "bowed." At this point advantage is taken of fine dry weather to gather up the flax, which is now ready for scutching, but the fibre is improved by stooking and stacking it for some time before it is taken to the scutching mill.

Dew-retting is the process by which all the Archangel flax and a large portion of that sent out from St. Petersburg are prepared. By this method the operation of steeping is entirely dispensed with, and the flax is, immediately after pulling, spread on the grass where it is under the influence of air, sun-light, night-dews, and rain. The process is tedious, the resulting fibre is brown in color, and it is said to be peculiarly liable to undergo heating (probably owing to the soft heavy quality of the flax) if exposed to moisture and kept close packed with little access of air. Archangel flax is, however, peculiarly soft and silky in structure, although in all probability water-retting would result in a fibre as good or even better in quality.

The theory of retting, according to the investigations of J. Kolb, is that a peculiar fermentation is set up under the influence of heat and moisture, resulting in a change of the intercellular substance—pectose or an analogue of that body—into pectin and pectic acid. The former, being soluble, is left in the water; but the latter, an insoluble body, is in part attached to the fibres, from which it is only separated by changing into soluble metapectic acid under the action of hot alkaline ley in the subsequent process of bleaching.

To a large extent retting continues to be conducted in the primitive fashions above described, although numerous and persistent attempts have been made to improve upon it, or to avoid the process altogether. The uniform result of all experiments has only been to demonstrate the scientific soundness of the ordinary process of water-retting, and all the proposed improvements of recent times seek to obviate the tediousness, difficulties, and uncertainties of the process as carried on in the open air. In the early part of the present century much attention was bestowed, especially in Ireland, on a process invented by Mr. James Lee. He proposed to separate the fibre by purely mechanical means without any retting whatever; but after the Irish Linen Board had expended many thousands of pounds and much time in making experiments and in erecting his machinery, his entire scheme ended in complete failure. About the year 1851 Chevalier Claussen sought to revive a process of "cottonizing" flax—a method of proceeding which had been suggested three-quarters of a century earlier. Claussen's process consisted in steeping flax fibre or tow for twenty-four hours in a weak solution of caustic soda, next boiling it for about two hours in a similar solution, and then saturating it in a solution containing 5 per cent. of carbonate of soda, after which it was immersed in a vat containing water acidulated with a half per cent. of sulphuric acid. The action of the acid on the carbonate of soda with which the fibre was impregnated caused the fibre to split up into a fine cotton-like mass, which it was intended to manufacture in the same manner as cotton. A process to turn good flax into bad cotton had, however, on the face of it, not much to recommend it to public acceptance; and Claussen's process therefore remains only as an interesting and suggestive experiment.

The only modification of water-retting which has hitherto endured the test of prolonged experiment, and taken a firm position as a distinct improvement, is the warm-water retting patented in England in 1846 by an American, Robert B. Schenck. For open pools and dams Schenck substitutes large wooden vats under cover, into which the flax is tightly packed in an upright position. The water admitted into the tanks is raised to and maintained at a temperature of from 75° to 95° Fahr. during the whole time the flax is in steep. In a short time a brisk fermentation is set up, gases at first of pleasant odor, but subsequently becoming very repulsive, being evolved, and producing a frothy scum over the surface of the water. The whole process occupies only from 50 to 60 hours. A still further improvement, due to Mr. Pownall, comes into operation at this point, which consists of immediately passing the stalks as they are taken out of the vats between heavy rollers over which a stream of pure water is kept flowing. By this means, not only is all the slimy glutinous adherent matter thoroughly separated, but the subsequent processes of breaking and scutching are much facilitated.

A process of retting by steam was introduced by W. Watt of Glasgow in 1852, and subsequently modified and improved by J. Buchanan. The system possessed the advantages of rapidity, being completed in about 10 hours, and freedom from any noxious odor; but it yielded only a harsh, ill-spinning fibre, and consequently failed to meet the sanguine expectations of its promoters.

In connection with improvements in retting, Mr. Michael Andrews, the energetic secretary of the Belfast Flax Supply Association, has made some suggestions and experiments which deserve close attention. In a paper contributed to the International Flax Congress at Vienna in 1873, he entered into details regarding an experimental rettery he had formed, with a view of imitating by artificial means the best results obtained by the ordinary methods. In brief, Mr. Andrews's method consists in introducing water at the proper temperature into the retting vat, and maintaining that temperature by keeping the air of the chamber at a proper degree of heat. By this means the flax is kept at a uniform temperature with great certainty, since even should the heat of the air vary considerably through neglect, the water in the vat only by slow degrees follows such fluctuations. "It may be remarked," says Mr. Andrews, "that the superiority claimed for this method of retting flax over what is known as the 'hot-water steeping' is uniformity of temperature; in fact the experiments have demonstrated that an absolute control can be exercised over the means adopted to produce the artificial climate in which the vats containing the flax are situated."

Scutching is the process by which the fibre is freed from its woody core and rendered fit for the market. For ordinary water-retted flax two operations are required, first *breaking* and then *scutching*, and these are done either by hand labor or by means of small scutching or lint mills, driven either by water or steam power. Hand labor, aided by simple implements, is still much used in Continental countries; but the use of scutching mills is now very general, these being more economical, and turning out flax of a much better quality. The breaking is done by passing the stalks between grooved rollers, to which in some cases a reciprocating motion is communicated, and the broken shives are beaten out by suspending the fibre in a machine fitted with a series of revolving blades, which, striking violently against the flax, shake out the bruised and broken woody cores. A great many modified scutching machines and processes have been proposed and introduced with the view of promoting economy of labor and improving the turn-out of fibre, both in respect of cleanness and in producing the least proportion of codilla or scutching tow.

The celebrated Courtrai flax of Belgium is the most valuable staple in the market, on account of its fineness, strength, and particularly bright color. There the flax is dried in the field, and housed or stacked during the winter succeeding its growth, and in the spring of the following year, it is retted in crates sunk in the sluggish waters of the river Lys. After the process has proceeded a certain length, the crates are withdrawn, and the sheaves taken out and stooked. It is thereafter once more tied up, placed in the crates, and sunk in the river to complete the retting process; but this double steeping is not invariably practised. When finally taken out, it is unloosed and put up in cones, instead of being grassed, and when quite dry it is stored for some time previous to undergoing the operation of scutching. In all operations the greatest care is taken, and the cultivators being peculiarly favored as to soil, climate, and water, Courtrai flax is a staple of unapproached excellence.

An experiment made by Professor Hodges of Belfast on 7770 ℔ of air-dried flax yielded the following results:—By rippling he separated 1946 ℔ of bolls which yielded 910 ℔ of seed. The 5824 ℔ (52 cwt.) of flax straw remaining lost in steeping 13 cwt., leaving 39 cwt. of retted stalks, and from that 6 cwt. 1 qr. 2 ℔ (702 ℔) of finished flax was procured. Thus the weight of the fibre was equal to about 9 per cent. of the dried flax with the bolls, 12 per cent. of the bolled straw, and over 16 per cent. of the retted straw. One hundred tons treated by Schenck's method gave 33 tons bolls, with 27·50 tons of loss in steeping; 32·13 tons were separated in scutching, leaving 5·90 tons of finished fibre, with 1·47 tons of tow and pluckings. The following analysis of two varieties of heckled Belgian flax is by Dr. Hugo Müller (Hoffmann's *Berichte über die Entwickelung der chemischen Industrie*):—

Ash	0·70	1·32
Water	8·65	10·70
Extractive matter	3·65	6·02
Fat and wax	2·39	2·37
Cellulose	82·57	71.50
Intercellular substance and pectose bodies	2·74	9·41

According to the determinations of Wiesner (*Die Rohstoffe des Pflanzenreiches*), the fibre ranges in length from 20 to 140 centimetres, the length of the individual cells being from 2·0 to 4·0 millimetres, and the limits of breadth between 0·012 and 0·025 mm., the average being 0·016 mm.

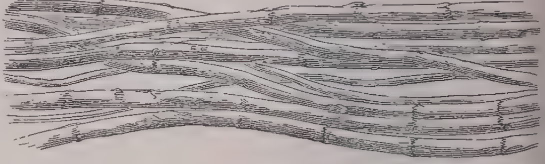

FIG. 2.—Fibre of Rough Russian Flax (magnified).

Among the circumstances which have retarded improvement both in the growing and preparing of flax, the fact that, till comparatively recent times, the whole industry was conducted only on a domestic scale has had much influence. At no very remote date it was the practice in Scotland for every small farmer and cotter not only to grow "lint" or flax in small patches, but to have it retted, scutched, cleaned, spun, woven, bleached, and finished entirely within the limits of his own premises, and all by members or dependants of the family. The same practice obtained and still largely prevails in other countries. Thus the flax industry was long kept away from the most powerful motives to apply to it labor-saving devices, and apart from the influence of scientific inquiry for the improvement of methods and processes. As cotton came to the front, just at the time when machine-spinning and power-loom weaving were being introduced, the result was that in many localities where flax crops had been grown for ages, the culture gradually drooped and ultimately ceased. The linen manufacture by degrees ceased to be a domestic industry, and began to centre in and become the characteristic factory employment of special localities, which depended, however, for their supply of raw material primarily on the operations of small growers, working, for the most part, on the poorer districts of remote, thinly populated countries. The cultivation of the plant and the preparation of the fibre have therefore, even at the present day, not come under the influence (except in certain favored localities) of scientific knowledge and experience, and the greater part of the flax in use at the present moment is prepared precisely by the processes employed in Egypt when the descendants of Jacob dwelt in the land of Goshen.

In England and Scotland the acreage under flax is now so limited, and it has decreased with such steadiness and rapidity, that, as a crop, flax may be regarded as practically extinct in these countries. Indeed, notwithstanding the numerous measures by which Government sought during last century to foster flax cultivation, and the direct grants to cultivators in Scotland, which down to the year 1828 were paid by the board of trustees for fisheries and manufactures, the cultivation cannot be said ever to have thriven in a healthy manner. The following summary, showing the extent in acres of the cultivation in Great Britain for the years 1870 till 1877 inclusive, has been communicated by Mr. Michael Andrews of Belfast:—

Year.	England.	Wales.	Scotland.	Total.
1870	22,354	204	1399	23,957
1871	15,949	175	1244	17,368
1872	14,011	84	1262	15,357
1873	13,752	190	741	14,684
1874	9,018	117	259	9,394
1875	6,547	54	150	6,751
1876	7,366	36	239	7,641
1877	7,210	28	243	7,481

In Ireland the cultivation of flax has always occupied a relatively much more important position than it has in the sister countries, though there also the experience is that it is a rapidly declining agricultural crop. In the time of Queen Anne a board of trustees of the linen and hempen manufactures for Ireland was instituted, by which body liberal grants were administered. The board continued its operations till the parliamentary grants were withdrawn in 1827, and itself dissolved in the following year. In 1841 a Royal Flax Society of Ireland was formed, which received from Government an annual subsidy of £1000, and it continued to exist till 1859. Still more recently a joint flax committee of the Royal Dublin Society and the Royal Agricultural Society of Ireland was formed, and administered grants from the imperial exchequer from the year 1864 till 1871. The acreage of Irish flax cultivated has fluctuated with these subsidies, having reached a maximum of 181,909 acres in 1824, from which it steadily declined to 53,863 acres in 1848. In 1853, partly stimulated by high prices and scarcity owing to Russian complications, it again rose to 174,579 acres; and the cotton famine consequent on the civil war in America again greatly stimulated the cultivation for a few years from 1862 onwards. The following are periodical returns from the registrar-general's statements since 1853:—

Table showing gross produce of Flax, yield per acre, and acreage under crop in Ireland, from the year 1853 to 1877 inclusive, according to the Registrar-General's Returns.

Year.	Acreage under Flax.	Gross produce.	Yield per Acre.	
		Tons.	Stones.	Lbs.
1853	174,579	43,862	40	3
1854	150,972	35,606	37	10
1855	97,106	23,428	38	9
1856	106,826	18,791	28	2
1857	98,074	14,475	23	9
1858	91,646	17,583	30	9
1859	136,282	21,576	25	5
1860	128,595	23,760	29	8
1861	147,866	22,568	24	6
1862	150,070	24,258	26	3
1863	214,099	42,646	31	12
1864	301,693	64,506	34	
1865	251,534	39,561	25	
1866	263,507	40,991	24	12
1867	253,257	35,392	22	5
1868	206,446	24,987	19	5
1869	229,178	29,569	20	8
1870	194,893	30,771	25	10
1871	156,883	12,929	13	3
1872	122,003	17,089	22	6
1873	129,432	19,843	24	8
1874	106,886	18,037	27	0
1875	101,248	22,464	35	7
1876	132,938	27,181	32	10
1877	123,362	No official	return.	

The foregoing table, and also the statistics given below, have been extracted from the carefully compiled reports of Mr. Michael Andrews for the Irish Flax Supply Association. The following statement embodies the latest available returns regarding the acreage and produce of flax in all the countries where the plant is cultivated on account of its fibre:—

Area under Flax and Gross Produce of various Countries.

		Statute Acres.	Stones.		Tons.
Austria	178,397 Jochs	253,323	at 21·48	per acre	34,009
Belgium	57,045 Hectares	140,901	" 33·59	"	29,580
Denmark		17,686	" 20·00	"	2,211
Egypt	(estimated)	15,000	" 20·00	"	1,875
France	78,774 Hectares	194,571	" 34·84	"	42,368
Germany	214,835 "	530,642	" 22·50	"	74,621
Great Britain		7,481	" 28·50	"	1,333
Greece		957	" 20·00	"	119
Holland	19,444 Hectares	48,027	" 31·77	"	9,536
Hungary	14,017 Jochs	19,903	" 20·00	"	2,488
Ireland		123,362	" 28.74	"	22,159
Italy	81,386 Hectares	201,023	" 18·14	"	22,791
Russia		1,928,568	" 20·00	"	241,071
Sweden		37,500	" 20·00	"	4,688
		3,518,944			488,849

It thus appears that the breadth of lands under flax in Russia alone is little less than four-sevenths of the entire acreage devoted to the production of the fibre, and that it alone produces practically one-half of the total produce of the world. The large extent to which the British manufacturers are dependent on Russia is shown in the following table:—

Imports and Exports of Flax, dressed and undressed, and Tow or Codilla, to and from the United Kingdom.

IMPORTS.

From	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Belgium	7,429	8,460	10,933	8,389	10,617	16,905	15,872	16,546	14,388	13,818	11,576	15,940
France	915	678	606	596	1,972	831	584	563	732	645	427	"
Germany	3,121	5,021	6,780	5,086	11,588	12,197	9,656	10,922	7,160	4,893	2,164	8,509
Holland	3,424	4,453	6,961	5,930	8,979	8,794	6,696	8,356	12,876	8,768	4,944	7,315
Russia	62,275	53,182	64,755	54,392	80,535	86,164	66,401	72,294	82,702	60,097	50,944	77,917
Other countries	215	239	798	2,717	4,985	4,462	1,839	990	846	476	237	1,132
Total	77,379	72,033	90,833	77,110	118,676	129,353	101,048	109,771	118,704	88,697	70,292	110,813

EXPORTS.

To	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	No information.
Belgium	575	551	359	169	714	126	1,093	1,194	1,224	837	289	
France	1,442	1,587	2,375	1,473	957	2,563	2,552	617	1,507	2,064	769	
United States	713	424	582	512	1,659	689	1,608	1,073	1,395	1,115	740	
Other countries	277	410	376	439	843	1,797	538	349	481	332	444	
Total	3,007	2,972	3,672	2,593	4,173	5,175	5,791	3,233	4,607	4,348	2,242	

The total value of the imports was £3,539,501 in 1876, and in 1877 it was £5,054,555, the increase in quantity being 57·6 per cent., and in value 42·8 per cent.

Messrs. George Armitstead & Co. of Dundee have courteously placed at our disposal their flax list for the week ended 14th May, 1878, which not only shows the sources and varieties of flax found in the British market, but also gives an idea of the relative value of the various staples.

For the substance of the remarks on the commerce which follow we have also to express obligation to that firm.

The names and letters attached to the various brands are thus explained, commencing with Riga flax:—

K means Crown flax.
HK " Light crown flax.
PK " Picked crown flax.
HPK " Light picked crown flax.
SPK " Superior picked crown flax.
ISPK " Light superior picked crown flax.

It will be observed that the "H" stands for "light" colored flaxes; but besides being bracked as above, any of the Riga crown flaxes which are of a "white" or "gray" color are laid aside and shipped from Riga as under (mostly, however, to France and Belgium), viz:—

GK or WK, Gray crown, or white crown.
GPK or WPK, Gray picked crown, or white picked crown.
GSPK or WSPK, Gray or white superior picked crown.

These are the principal marks of Riga crown sorts. Of other qualities shipped from Riga there are "*Hoffs*" flaxes (drawn from the Livonian district):—

HD means Hoffs Dreiband flax.
WHD " White Hoffs Dreiband flax.
PHD " Picked white Hoffs Dreiband flax.
WPHD " White picked Hoffs Dreiband flax.
FPHD " Fine picked Hoffs Dreiband flax.
WFPHD " White fine picked Hoffs Dreiband flax.
SFPHD " Superior fine picked Hoffs Dreiband flax.
WSFPHD " White superior fine picked Hoffs Drieband flax.

Dundee Market Report on Flax, May 14, 1878.

	Quotations per Ton.			
FLAX—ARCHANGEL 1st Crown	£63	0	0	0
" 2d Crown	60	0	£61	0
" 3d Crown	57	0	58	0
" 4th Crown	53	0	54	0
" 1st Zabrack	48	0	49	0
" 2d "	43	0	44	0
PETERSBURG Pscow 12 Heads	45	0	46	0
" Louga and Staro Russ 12 Heads.	39	0	40	0
" Saletsky 12 Heads	29	0	30	0
" " 9 Heads	26	0	28	0
" " 6 Heads	23	0	24	0
" Rjeff 3 Crown	40	0	41	0
" " Zabrack	36	10	37	0
NARVA No. V	0	0	0	0
" No. VI	0	0	0	0
PERNAU Livonian OD	36	0	37	0
" D	42	0	43	0
" HD	47	0	48	0
RIGA K	40	0	41	0
" PK	43	0	44	0
" SPK	47	0	48	0
" HSPK	48	0	49	0
" HD	37	0	38	0
" PHD	40	0	41	0
" FPHD	43	0	44	0
" W	35	0	36	0
" PW	38	0	39	0
" D	30	0	32	0
" PD	32	0	34	0
" LD	30	0	32	0
" PLD	32	0	34	0
" SD	31	0	33	0
" PSD	33	0	35	0
" DW	25	0	27	0
LIBAU Crown	0	0	0	0
" 4 Brand	0	0	0	0
MEMEL 4 Brand	35	0	36	0
" N.B	0	0	0	0
TOW—ARCHANGEL No. 1	40	0	41	0
" No. 2	36	0	37	0
PETERSBURG No. 1	37	0	40	0
" No. 2	28	0	32	0
CODILLA—ARCHANGEL No. 2	37	0	38	0
" No. 3	27	0	30	0
PETERSBURG	0	0	0	0
RIGA	0	0	0	0

Of the lower qualities of Riga flax the following may be named:—

W, Wrack flax. PW, Picked wrack flax.
WPW, White picked wrack. GPW, Gray picked wrack flax.
D, Dreiband (Threeband). PD, Picked Dreiband flax.
LD, Livonian Dreiband. PLD, Picked Livonian Dreiband.
SD, Slanitz Dreiband. PSD, Picked Slanitz Dreiband.

The last-named (SD and PSD) are dew-retted qualities shipped from Riga either as Lithuanian Slanitz, Wellish Slanitz, or Wiasma Slanitz, showing from what district they come, as there are differences in the quality of the produce of each district. The lowest quality of Riga flax is marked DW, meaning Dreiband Wrack.

Another Russian port from which a large quantity of flax is imported is Pernau, where the marks in use are comparatively few. The leading marks are—

LOD, indicating Low Ordinary Dreiband (Threeband).
OD, " Ordinary Dreiband.
D, " Dreiband.
HD, " Light Dreiband.
R, " Risten.
G, " Cut.
M, " Marienburg.

Pernau flax is shipped as Livonian and Fellin sorts, the latter being the best. The lowest mark of Pernau flax is the LOD. In addition to the exports from Riga and Pernau, shipments of flax are made from Narva, Libau, Memel, and Revel; but, as compared with the two first-mentioned ports, the flax trade of the others is inconsiderable. The only remaining localities from which flax is extensively exported to Scotland are Archangel and St. Petersburg. From St. Petersburg both white and brown flax is sent, the former variety being water-retted, the latter dew-retted. All the flax of Archangel is dew-retted.

The Pscow, Louga, Staro, Russ, and Saletsky flaxes are steeped or white flax, whereas the Rjeff flax is dew-retted. There are many other kinds which come into the Dundee market from St. Petersburg, such as Melinki, Bejetsky, Ouglitch, Kostroma, Jaroslav, Vologda, Wiasma, etc., taking their names from the various districts, and all dew-retted flax. These Petersburg brown flaxes are bracked mostly in 1st, 2d, 3d, and 4th crown, also Zabrack, the lowest mark. Some Petersburg sorts leave out the 1st crown and 4th crown, but in the Archangel flaxes all these marks appear, and the Zabrack is divided into two sorts, 1st and 2d Zabrack.

The distinction between codilla and tow is that the former is the tow or broken and ravelled fibres produced in the scutching process, therefore often called scutching tow, while tow proper is the similar product separated in the subsequent operation of heckling the flax preparatory to spinning. See AGRICULTURE (vol. i. pp. 337, 338), BLEACHING, LINEN, and LINSEED OIL. (J. PA.)

FLAXMAN, JOHN (1755-1826), was the greatest sculptor, or, if that title may be disputed on account of certain technical shortcomings in his work, at any rate the greatest designer of sculpture, that England has produced; and as a representative of the Greek spirit in modern art his name stands among the foremost, not of England merely, but of the world.

He was born on the 6th of July, 1755. His name, John, was hereditary in the family, having been borne by his father after a forefather who, according to the family tradition, had fought on the side of parliament at Naseby, and afterwards settled as a carrier or farmer, or both, in Buckinghamshire. John Flaxman the elder carried on with repute the trade of a moulder and seller of plaster casts in New Street, Covent Garden, London. Our sculptor was the second son of his parents, and was born while they were temporarily living at York. Within six months of his birth they returned to London, and in his father's back shop he spent an ailing childhood, in the course of which his life was once at least despaired of. His figure was high-shouldered and weakly, with the head very large for the body. His father by and by removed to a more commodious house in the Strand, and, his first wife dying, married a second, who proved a thrifty housekeeper and gentle stepmother. Of regular schooling the boy must have had some, since he is reputed as having remembered in after life the tyranny of some pedagogue of his youth; but his principal education he picked up for himself at home. He early took delight in drawing and modelling from his father's stock-in-trade, and early endeavored to understand those counterfeits of classic art by the light of translations from classic literature. Customers of his father took a fancy to the child, and helped him with books, advice, and presently with commissions. The two special encouragers of his youth were the painter Romney, and a cultivated clergyman, Mr. Mathew, in whose house in Rathbone Place the young Flaxman used to meet the lettered society of those days, and, among associates of his own age, the artists Blake and Strothard. Before this he had begun to work with success in clay as well as in pencil. At eleven years old, and again at thirteen, he won prizes from the Society of Arts. At twelve he became a public exhibitor in the gallery of the Free Society of Artists, and at fifteen in that of the Royal Academy, then in the second year of its existence. In the same year, 1770, he entered as an Academy student, and won the silver medal. But all these successes were followed by a discomfiture. In the competition for the gold medal of the Academy, Flaxman, who had made quite sure of victory, was defeated, the prize being adjudged by the president, Sir Joshua Reynolds, to another competitor named Engleheart. But this reverse proved no discouragement, and the young Flaxman continued to ply his art diligently, both as a student in the schools and as an exhibitor in the galleries of the Academy, occasionally also attempting diversions into the sister art of painting. Before long he received a commission, from a friend of the Mathew family, for a statue of Alexander. But by heroic and ideal work of this class—and it was work of this class that he at first almost exclusively exhibited—he could of course make no regular livelihood. The means of such a livelihood, however, presented themselves in his twentieth year, when he first received employment from Josiah Wedgwood and his partner Bentley, as a modeller of classic and domestic friezes, plaques, ornamental vessels, and medallion portraits, in those varieties of "jasper" and "basalt" ware which earned in their day so prodigious a reputation for the manufacturers who had conceived and perfected the invention, and of which the examples, dispersed and disregarded during the first fifty years of this century, have now again returned into favor among the curious, and are disputed in sale-rooms at prices greater than they fetched in the first fever of the fashion. For twelve years, from his twentieth to his thirty-second (1775–1787), Flaxman subsisted chiefly by his work for the firm of Wedgwood. It may be urged, of the extreme refinements of figure outline and modelling which these manufacturers aimed at in their ware, that they were not the qualities best suited to such a material; or it may be regretted that the gifts of one of the greatest figure designers who ever lived should have been employed upon such a minor and half-mechanical art of household decoration; but the beauty of the product it would be idle to deny, or the value of the training which the sculptor by this practice acquired in the delicacies, the very utmost delicacies and severities, of modelling in low relief and on a minute scale. By 1780 Flaxman had begun to earn something in another, and, so to speak, a more legitimate branch of his profession. This was in the sculpture of monuments for the dead. Three of the earliest of such monuments by his hand are those of Chatterton in the church of St. Mary Redcliffe at Bristol, of Mrs. Morley in Gloucester Cathedral, and of a widow comforted by an angel, in the cathedral at Chichester. During the rest of Flaxman's career memorial bas-reliefs of the same class occupied a principal part of his industry; they are to be found scattered in many churches throughout the length and breadth of England, and in them all the finest qualities of his art are represented. The best are quite unsurpassable for pathos, for simplicity, for an instinct of composition as just, pure, and lovely as that of the Greeks themselves, and for the alliance with those harmonious lines and groupings of the ancients of that spirit of domestic tenderness and innocence which is the secret, and the holiest secret, of the modern soul.

In 1782, being twenty-seven years old, Flaxman was married to Anne Denman, and had in her the best of helpmates until almost his life's end. She was a woman of attainments in letters and to some extent in art, and the devoted companion of her husband's fortunes and of his travels. They set up house at first in Wardour Street, and lived an industrious life, spending their summer holidays once and again in the house of the hospitable poet Hayley, at Eartham in Sussex. After five years, in 1787, they found themselves with means enough to travel, and set out for Rome. Records more numerous and more consecutive of Flaxman's residence in Italy exist in the shape of drawings and studies than in the shape of correspondence. He soon ceased modelling himself for Wedgwood, but continued to direct the work of other modellers employed for the manufacture at Rome. He had intended to return after a stay of a little more than two years, but was detained by a commission for a marble group of a Fury of Athamas, a commission attended in the sequel with circumstances of infinite trouble and annoyance, from the notorious Comte-Évêque, Frederick Hervey, earl of Bristol and bishop of Derry. He did not, as things fell out, return until the summer of 1794, after an absence of seven years,—having in the mean time executed another ideal commission (a Cephalus and Aurora) for Mr. Hope, and having sent home models for several funeral monuments, including that of the poet Collins in Chichester Cathedral. But what gained for Flaxman in this interval an immense and European fame was not his work in sculpture proper, but those outline designs to the poets, in which he showed not only to what purpose he had made his own the principles of ancient design in vase-paintings and bas-reliefs, but also by what a natural affinity, better than all mere learning, he was bound to the ancients and belonged to them. The designs for the *Iliad* and *Odyssey* were commissioned by Mrs. Hare Naylor; those for Dante by Mr. Hope; those for Æschylus by Lady Spencer. During their homeward journey the Flaxmans travelled through central and northern Italy. On their return they took a house, which they never afterwards left, in Buckingham Street, Fitzroy Square. Immediately afterwards we find a sculptor exhibiting the model of a large monument in the round, that of Lord Mansfield, now in Westminster Abbey, and at the same time publishing a spirited protest against the scheme already entertained by the Directory, and carried out five years later by Napoleon, of equipping at Paris a vast central museum of art with the spoils of conquered Europe.

The record of Flaxman's life is henceforth an uneventful record of private affection and contentment, of happy and tenacious industry; with reward not brilliant, but sufficient; with repute not loud, but loudest in the mouths of those whose praise was best worth having—Canova, Schlegel, Fuseli; of quiet, beloved, modestly enthusiastic, and simply honorable life. He took for pupil a son of Hayley's, who presently afterwards sickened and died. In 1797 he was made an associate of the Royal Academy. Every year he exhibited work of one class or another: occasionally a public monument in the round, like those of Paoli or Captain Montague for Westminster Abbey, and of Nelson or Howe for St. Paul's; more constantly, memorials for churches, with symbolic Acts of Mercy or illustrations of Scripture texts, both commonly in low relief; and these pious labors he would vary from time to time with a classical piece like those of his earliest predilection. Soon after his election as associate, he published a scheme, half grandiose half childish, for a monument to be erected on Greenwich Hill, in the shape of a Britannia 200 feet high, in honor of the naval victories of his country. In 1800 he was elected full Academician. During the peace of Amiens he went to Paris to see the despoiled treasures now actually collected there, but bore himself according to the spirit of protest that was in him. The next event which makes any mark in his life is his appointment to a chair specially created for him by the Royal Academy—the chair of Sculpture: this took place in 1810. We have ample evidence of his thoroughness and judiciousness as a teacher in the Academy schools, and his professorial lectures have been often reprinted. With many excellent observations, and with one singular merit,—that of doing justice, as in those days justice was hardly ever done, to the sculpture of the mediæval schools,—these lectures lack point and felicity of expression, just as they are reported to have lacked fire in delivery, and are somewhat heavy reading. The most important works that occupied Flaxman in the years next following this appointment were the monument to Mrs. Baring in Micheldever church, the richest of all his monuments in relief; that to Lord Cornwallis, destined for India; and that to Sir John Moore, for Corunna; with a pastoral Apollo for Lord Egremont. At this time the antiquarian world was much occupied with the vexed question of the merits of the Elgin marbles, and Flaxman was one of those whose evidence before the parliamentary commission had most weight in favor of the purchase which was ultimately effected in 1816. In 1817 we find him returning to his old practice of classical outline illustrations, and producing the happiest of all his series in that kind, the designs to Hesiod, engraved by the friendly hand of Blake. Immediately afterwards he is much engaged designing for the goldsmiths—a testimonial cup in honor of John Kemble, and, following that, the great labor of the famous Shield of Achilles. Almost at the same time he undertakes a frieze of Peace, Liberty, and

Plenty, for the duke of Bedford's sculpture gallery at Woburn, and an heroic group of Michael overthrowing Satan, for Lord Egremont's house at Petworth.

In 1820 died Mrs. Flaxman, after a first warning from paralysis six years earlier. Her younger sister, Maria Denman, and the sculptor's own sister, Maria Flaxman, remained in his house, and his industry was scarcely at all relaxed. In 1822 he delivered at the Academy a lecture in memory of his old friend and generous fellow-craftsman, Canova, then lately dead; in 1823 he received from A. W. Von Schlegel a visit of which that writer has left us the record. From an illness occurring soon after this he recovered sufficiently to resume both work and exhibition, but on the 26th of December, 1826, he caught cold in church, and died three days later, in his seventy-second year. Among a few intimate associates he left a memory singularly dear; having been in companionship, although susceptible and obstinate when his religious creed—a devout Christianity with Swedenborgian admixtures—was crossed or slighted, yet in other things genial and sweet tempered beyond all men, full of modesty, full of playfulness and of a homely dignity withal, the truest friend, the kindest master, the purest and most blameless spirit.

Posterity will doubt whether it was the fault of Flaxman or of his age, which in England offered neither training nor much encouragement to a sculptor, that he is weakest when he is most ambitious, and then most inspired when he makes the least effort; but so it is. Not merely does he fail when he seeks to illustrate the intensity of Dante, or to rival the tumultuousness of Michelangelo—to be intense or tumultuous he was never made; but he fails, it may almost be said, in proportion as his work is elaborate and far carried, and succeeds in proportion as it is partial and suggestive. Of his completed ideal sculptures, the St. Michael at Petworth is by far the best, and is indeed admirably composed from all points of view; but it lacks fire and force, and it lacks the finer touches of the chisel; a little bas-relief like the diploma piece of the Apollo and Marpessa in the Royal Academy compares with it favorably. Again, of Flaxman's complicated monuments in the round—we speak of the three in Westminster Abbey and the four in St. Paul's—there is scarcely one which has not something heavy and infelicitous in the arrangement, and something empty and unsatisfactory in the surface execution. But when we come to his simple monuments in relief, in these we find usually an almost complete felicity. The truth is, that he did not thoroughly understand composition on the great scale and in the round; but he thoroughly understood relief, and found scope in it for all his unrivalled gifts of rhythmical design, and tender, grave, and penetrating feeling. Of pity and love he is a perfect master, and shows, as no one had ever shown before, how poignantly those passions can be expressed in the simplest conceivable combinations of human shapes and gestures. But if we would see even these the happiest of his conceptions at their best, we must study them, not in the finished monument, but rather in the casts from his studio sketches, of which so precious a collection is preserved in the Flaxman gallery at University College. And the same is true of his happiest efforts in the classical and poetical vein, like the well-known relief of Pandora conveyed to Earth by Mercury. Nay, going further back still among the rudiments and first conceptions of his art, we can realize the most essential charm of his genius in the study, not of his modelled work at all, but of his outlined and tinted sketches on paper. Of these, too, there is at University College a choice collection, and many others are dispersed in public and private cabinets. Every one knows the excellence of the engraved designs to Homer, Dante, Æschylus, and Hesiod, in all cases save when the designer aims at that which he cannot hit, the terrible or the grotesque. To know Flaxman at his best, it is necessary to be acquainted not only with the original studies for such designs as these, but still more with those almost innumerable studies from real life which he was continually producing with pen, tint, or pencil. These are the most delightful and suggestive *sculptor's notes*, so to speak, in existence; in them it was his habit to set down, with a perfect feeling and directness, the leading or expressive lines, and generally no more, of every group that struck his fancy. There are groups of Italy and London, groups of the parlor and the nursery, of the street, the garden, and the gutter; and of each group the artist knows how to seize at once the structural and the spiritual secret, expressing perfectly the value and suggestiveness, for his art of sculpture, of the contacts, intervals, interlacements, and balancings of the various figures in any given group, and not less perfectly the charm of the affections which link the figures together and harmonize their gestures.

The materials for the life of Flaxman are scattered in various biographical and other publications; the principal are the following:—An anonymous sketch in the *European Magazine* for 1823; an anonymous "Brief Memoir," prefixed to *Flaxman's Lectures*, ed. 1829, and reprinted in subsequent editions; the chapter in Allan Cunningham's *Lives of the Most Eminent British Painters*, etc., vol. iii.; notices in the *Life of Nollekens*, by John Thomas Smith; in the *Life of Josiah Wedgwood*, by Miss G. Meteyard, London, 1865; in the *Diaries and Reminiscences of H. Crabbe Robinson*, London, 1869, the latter an authority of great importance; in the *Lives* of Stothard, by Mrs. Bray, of Constable, by Leslie, of Watson, by Dr. Lonsdale, and of Blake, by Messrs. Gilchrist and Rossetti; a series of illustrated essays, principally on the monumental sculpture of Flaxman, in the *Art Journal* for 1867 and 1868, by Mr. G. F. Teniswood; *Essays in English Art*, by Frederick Wedmore; *The Drawings of Flaxman, in 32 plates, with Descriptions, and an Introductory Essay on the Life and Genius of Flaxman*, by Prof. Sidney Colvin, M.A., atlas fol., London, 1876. (S. C.)

FLEA, an Anglo-Saxon name, probably derived from "fleogan," to fly, typically applied to *Pulex irritans*, a blood-sucking insect-parasite of man and other mammals, remarkable for its powers of leaping, and unfortunately too well known, even in our own temperate climate. Its position in classification has long been somewhat undecided; a separate order was erected for it and its allies under the various names of *Suctoria*, *Siphonaptera*, *Rophoteira*, and *Aphaniptera*, by De Geer, Latreille, Clairville, and Kirby respectively; and it is included in the *Aptera* of Lamarck, MacLeay, and others, and in the *Rhyngota* of Fabricius. Various affinities have also been attributed to the group, which has been supposed to have relations with the *Hymenoptera*, *Hemiptera*, and *Anoplura*, and even with the *Coleoptera* (beetles). As regards the latter order, it is noteworthy that a recently discovered allied group, *Platypsyllidæ*, founded upon a parasite on the beaver (and considered as a separate order by Westwood, under the name *Achreioptera*), has been with considerable show of reason referred to the beetles by so sound an entomologist as Dr. Leconte. As regards the flea, however, it is now generally accepted that its true affinities are with the *Diptera* or two-winged flies, as suggested by Lamarck and Strauss Durckheim. In that order, it is by some held to occupy, as a family *Pulicidæ* (with the *Platypsyllidæ*), the position of a sub-order, at the end, under the name *Aphaniptera* (see DIPTERA, vol. vii. p. 223); but by others it is placed before the *Mycetophilidæ*, at the head of the tribe *Eucephala* of the Nematocerous section of the great division *Orthorhapha*. The community of parasitic habits with the *Hippoboscidæ* (forest-flies and sheep-ticks) is to a certain extent the reason for the former position; but the earlier transformations seem to indicate a stronger relationship with the *Eucephala*. The general characters have been given under DIPTERA; but the structure of the mouth of the perfect insect may be specified. The labrum is obsolete; the mandibles are represented by two flat and long processes, strengthened by a mid rib, and having very finely toothed edges, and uniting with the slender central lingua to form a puncturing lancet. When not in use, this is protected by the labial palpi, which form a sort of tube. The maxillæ are small leathery plates, and their palpi, which are four-jointed and large, have been mistaken for antennæ. The power of leaping, as well known, is very great; but there is no apparent development of the hind femora to account for it (as in many jumping beetles), although the posterior legs are saltatorial. The great muscular power of fleas has been long turned to account by public exhibitors in all countries, who have under the pretence of taming or educating these minute creatures, made use of various contrivances to render the natural efforts of the insect to escape assume the appearance of trained action. An account of the methods employed will be found in the *American Naturalist*, vol. xi. p. 7, from the pen of Mr. W. H. Dall. In some cases the steady carriage of the flea is to be traced to fracture of its jumping legs. The female flea lays a few oblong white eggs, in dirty places on floors frequented by domestic animals. The larvæ, before hatching, have a frontal point, used in breaking the shell of the egg. They are long and worm-like, without feet, but with two small hooks at the tail, and short antennæ and mouth organs at the head. They are very active, and apparently feed upon animal substances, forming, when full grown, a silky cocoon. Many species are known, parasitic upon various animals and birds. They have been recorded as infesting the inside of rabbits' ears, and the neck of a fowl, from hedgehog, marmot, cat, dog, bat, squirrel, dormouse, ferret, weasel, hare, rabbit, rat, mouse, field-mouse, shrew, moor-hen, jackdaw, thrush, missel-thrush, blackbird, jay, bullfinch, chaffinch, yellow-hammer, pipit, blackcap, whitethroat, skylark, willow wren, long-tailed titmouse, siskin, stock-dove, wood-pigeon, common pigeon, starling, swallow, etc. (though it is by no means certain that these are all necessarily of distinct specific value); and a species has been described from the common fowl in Ceylon. A large species is often found in sandy pits, near the openings of the nests of sand-martins, and a very large one sometimes occurs in wet and marshy places, probably living upon the mole. For the latter parasite, and others in which the antennæ exhibit certain supposed peculiarities, a separate genus, *Ceratopsyllus*, has been proposed. In another flea, also found on the mole, no trace of eyes could be found, even under a high power. A very large species has been found on the Australian porcupine in Tasmania; and Kirby, in the *Fauna Boreali-Americana*, described as *Pulex gigas* a flea two lines long, which he believed to be the largest known. This was taken in 65° N. lat. Westwood has recorded 17 British species; and oddly enough the same number are noted from the Netherlands by Ritsema. Any notice of these parasites would be incomplete without a reference to the "jigger," "chigoe," "bicho de pé," "nigua," or "earth-flea,"—*Dermatophilus*, *Sarcopsyllus*, or *Rhynchoprion penetrans*, so well known as a burrower into the naked feet of men, in sandy localities in the West Indies and South America. So great is this pest, that serious trouble has been occasioned by it even to military expeditions in South America; and the French army in Mexico was much troubled by it. The entry is effected usually under the nail, by the impregnated female, which thereupon becomes enormously distended with an immense number of eggs. Inflammation and ulceration follow this attack, and unless great care is taken in extracting the insect, serious illness and even death result. A good plate of the metamorphoses of this species is given in the volume of the *American Naturalist* above quoted, p. 754. For an account of the medical aspects, see Dr. Laboulbène's article on the "Chique," in the *Dictionnaire Enclycopédique des Sciences Médicales* (Paris 1875), p. 239; and for an exhaustive history, Guyon's memoir in the *Revue et Magasin de Zoologie* for 1868 and 1869. Much attention does not appear as yet to have been paid to the *Pulicidæ* by naturalists, except as regards the anatomy of the common species. Dugès's "Recherches sur les Caractères Zoologiques du genre Pulex," in the *Annales des Sciences Naturelles*, vol. xxvii. (1832) p. 145, and J. Künckel's observations in the *Annales de la Société Entomologique de France*, 5^{e} sér. iii. p. 129, and as regards *P. irritans*, W. H. Furlonge's descriptions in the journal of the *Quekett Microscopical Club*, 1871, p. 189, and 1873, p. 12, and C. Ritsema's in the *Album der Natuur*, xi. (1872), p. 65, may be specially noticed. The name "flea" is frequently erroneously applied to many jumping or lively insects not allied to the *Pulicidæ;* for instance, the "turnip-flea" is a small beetle, *Phyllotreta undulata*, one of the *Halticidæ*. (E. C. R.)

FLÉCHIER, Esprit (1632–1710), bishop of Nismes, a respectable author, and one of the most celebrated preachers of his age, was born at Pernes, department of Vaucluse, on the 10th of June, 1632, and educated at Tarascon sur Rhône, in the College of the Fathers of the Congregation of Christian doctrine, of which his uncle, Hercule Audifret, also famous in his time for his talents as a preacher, was general. After having gone through the ordinary course of studies, Fléchier entered the Congregation, and, according to the constitution of the order, was immediately employed in teaching. In 1659, he became a professor of rhetoric at Narbonne, and there pronounced the funeral oration of M. de Rebé, archbishop of that city. A few months afterwards, the death of his uncle called him to Paris, where he laid aside the habit of the doctrinaire, and at first followed the humble occupation of a parochial catechist. He soon made himself known by his poetical compositions in Latin and French. In 1660, he addressed to Cardinal Mazarin a poem called *Carmen Eucharisticum*, celebrating the Peace of the Pyrenees; the following year he sang the birth of the dauphin in another poem (*Genethliacon*); but what first made him famous was a description in Latin verse of a brilliant tournament (*carrousel*), *Circus Regius*, given by Louis XIV. in 1662. Chapelain, the most influential critic of that time, brought his name under the notice of Colbert, with the remark, "Fléchier est encore un très bon poëte latin." He was now entrusted with the education of Louis Urbain Lefevre de Caumartin, afterwards *intendant* of finances and counsellor of state; and as the house of his pupil's father was then frequented by the most important personages both of the court and the city, Fléchier was introduced into the best society, and soon made many friends. He had to accompany Caumartin and his family to Clermont, where the king had ordered the *Grands Jours* to be held (1665), and where Caumartin was sent as keeper of the seals and representative of the sovereign. There he wrote his curious *Mémoires sur les Grand Jours d' Auvergne*, first published in 1844 by Gonod, in which he relates, in a half-romantic, half-historical form, the proceedings of this extraordinary court of justice. The duke of Montausier, who had become his patron, now procured for him the situation of *lecteur* to the dauphin. The sermons of Fléchier increased his reputation, which was afterwards raised to the highest pitch by his funeral orations. Having been chosen to pronounce that of Madame de Montausier (1672), he displayed so great ability on the occasion that in the following year he was made a member of the French Academy, along with Racine. The funeral oration of the Duchesse d'Aiguillon (1675), and, above all, that of Turenne (1676), are, with that of Madame de Montausier, his masterpieces in that branch of literature. The favors of the court now poured in upon Fléchier. The king gave him successively the abbacy of St. Leverin, in the diocese of Poitiers, the office of almoner to the dauphiness, and in 1685 the bishopric of Lavaur, from which he was in 1687 promoted to that of Nismes. Here Fléchier had occasion for the daily exercise of his great qualities, gentleness and moderation. The edict of Nantes had been repealed two years before; but the Calvinists were still very numerous at Nismes, and the sincerity of the conversion of such as had made abjuration was at best but doubtful. Fléchier, by his prudent conduct, in which zeal was tempered with charity, succeeded in bringing over some of them to his views, and made himself esteemed and beloved even by those who declined to change their faith. During the troubles in the Cévennes, he softened to the utmost of his power the rigor of the edicts, and showed himself so sensible of the evils of persecution, and so indulgent even to what he regarded as error, that his memory was long held in veneration amongst the Protestants of that district. In the famine which succeeded the winter of 1709, he did much to alleviate the prevalent distress, by assisting the poor in his diocese without regard to their religious tenets, declaring that all alike were his children. He died at Montpellier on the 16th February, 1710, at the advanced age of seventy-eight. Pulpit eloquence is the branch of belles lettres in which Fléchier excelled. He is indeed far below Bossuet, whose robust and sublime genius had no rival in that age; he does not equal Bourdaloue in earnestness of thought and vigor of expression; nor can he rival the philosophical depth or the insinuating and impressive eloquence of Massillon. But he is always ingenious, often witty, and nobody has carried further than he the harmony of diction,—a quality which is sometimes marred, it must be confessed, by an affectation of symmetry and a love of antithesis at variance with the principles of good taste. His two historical works, the histories of Theodosius and of Ximenes, are more remarkable for elegance of style than for the accuracy and comprehensive insight which are the chief requisites of a historian.

The following is a list of Fléchier's works, in the order of publication:—1. *La Vie du Cardinal Commendon*, Paris, 1671, 4to (also published in Latin, 1699, 12mo); 2. *Histoire de Théodose-le-Grand*, Paris, 1679, 4to; 3. *De Casibus Virorum Illustrium autore Antonio Maria Gratiano, opera et studio Sp. Flecherii*, Paris, 1680, 4to; 4. *Oraisons funèbres*, Paris, 1681, 4to and 12mo; 5. *Panégyriques des Saints*, Paris, 1690, 4to; 6. *Histoire du Cardinal Ximenes*, Paris, 1694, 4to; 7. *Sermons de morale prêchés devant le Roi, avec des Discours synodaux et les Sermons prêchés par Fléchier aux États de Languedoc et dans* *sa Cathédrale*, 3 vols, 12mo; 8. *Œuvres posthumes, contenant ses Harangues, Compliments, Discours, Poésies Latines, Poésies françaises*, Paris, 1712, 12mo; 9. *Mandements et Lettres pastorales*, Paris, 1712, 12mo; 10. *Lettres choisies sur divers sujets*, Paris, 1715, 2 vols. 12mo. The most complete collection of his works is that of the Abbé Ducreux, canon of Auxerre, Nismes, 1782, 10 vols. 8vo. Another edition, with a notice of his life by A. V. Fabre of Narbonne, Paris, 1825–28, 10 vols. 8vo, is very defective. His *Mémoires sur les Grands Jours d'Auvergne* were published in 1844 (2d edit., with a notice by Sainte-Beuve and an appendix by M. Chéruel, Paris, 1862). A MS. in the French National Library (Suppl. fr., No. 1016, fol.) contains a few compositions by Fléchier, both in prose and in verse, which are as yet unpublished. For Fléchier's biography, see L. Juillard du Jarry, *Oraison funèbre d'E. Fléchier, évêque de Nîmes*, Paris, 1710, 4to; Ch. F. Trinquelague, *Éloge d'E. Fléchier, évêque de Nîmes*, Nismes and Paris, 1777, 8vo.

FLECKNOE, Richard, a poet and dramatic writer in the reign of Charles II. He was an Irishman by birth, and was originally a priest of the order of Jesus. Like many of the small wits and minor poets of that day, Flecknoe owes the rescue of his name from oblivion to the satirical genius of Dryden. That satirist availed himself of Flecknoe's name as a stalking horse from behind which to assail the poetaster Shadwell, who had been appointed to replace him in the laureateship. The opening lines of this satire may be quoted as a specimen of the whole:—

> "All human things are subject to decay;
> And when fate summons, monarchs must obey.
> This Flecknoe found, who, like Augustus, young
> Was called to empire and had governed long;
> In prose and verse was owned without dispute
> Throughout the realms of nonsense absolute."

It is but fair, however, to remark, that clever and effective as this poem is, it is in its application to Flecknoe utterly unjust. Flecknoe was the author of several plays, only one of which, *Love's Dominion*, printed in 1654, was acted. This piece was republished in 1674, as *Love's Kingdom, a Pastoral Trage-Comedy.* This was not the play as acted, but as re-written and corrected. His minor pieces, though possessing no great merit in the matter of versification, nevertheless contain many happy turns of thought and felicities of expression. His *Damoiselles à la Mode*, printed in 1677, and addressed to the duke and duchess of Newcastle, and *Sir W. Davenant's Voyage to the Other World*, are a witty exposure of the literary and dramatic foibles of the day. The characters of the first named, he says in his preface, are "like so many precious stones I have brought out of France, and as a lapidary set in one jewel to adorn our English stage." They are adaptations from Molière. His unpopularity among the players, and the satire of Dryden, upon whom, nevertheless, Flecknoe composed a witty and graceful epigram, must have been in a great measure owing to his attacks on the immorality and general worthlessness of the English stage. An interesting but almost unknown production of Flecknoe's is *The Idea of His Highness Oliver late Lord Protector*, etc., London, 1659,—an appreciative estimate of Cromwell's character, as evidenced in his parliamentary career and his achievements as soldier and statesman. Flecknoe died in 1678.

His principal remaining works are—*Ermina; or, The Chaste Lady; The Marriage of Oceanus and Britannia; Epigrams and Enigmatical Characters*, 1670, in 8vo; *Miscellanea*, or poems of *all* sorts, with divers *other* pieces, 1653, in 12mo; *Diarium*, or the Journal, divided into twelve Jornadas, in burlesque verse, London, 1656, in 12mo. See also his *Discourse of the English Stage*, first published in the volume for 1869 of the Roxburgh Library, edited by Mr. W. C. Hazlitt.

FLEETWOOD, or Fleetwood-on-Wyre, a market-town, watering-place, and seaport of Lancashire, England, 22 miles by rail from Preston. It dates its rise from 1836, and takes its name from Sir P. H. Fleetwood, by whom it was laid out. The principal buildings are St. Peter's church, the Roman Catholic church, the Whitworth institute, and the Euston barracks, which have quarters for 300 men and 60 officers. The harbor is safe and extensive, and the shipping accommodation was increased in 1877 by the completion of a new dock, with an area of 10 acres and a maximum depth of 34 feet. Steamers ply regularly from Fleetwood to Belfast and the Isle of Man. The value of the imports in 1876 was £162,984 and of the exports of British produce £507. Population in 1871, 4428.

FLEETWOOD, Charles, lord-deputy of Ireland under the Commonwealth, and son-in-law of Cromwell, was born most probably in 1620. Entering the ranks of the parliamentary forces, he rose in 1644 to the rank of colonel of horse, and in 1645 was appointed governor of Bristol. At the battle of Dunbar in 1650 he was lieutenant-general of the horse; and at the battle of Worcester in 1651, the division commanded by him contributed chiefly to the victory of the parliamentary army. After the death of his first wife he was married to Bridget, eldest daughter of Cromwell and widow of Ireton; and in the same year he was appointed commander-in-chief of the forces in Ireland. In 1654 he became lord-deputy, but manifested such weakness and irresolution in dealing with the different political parties of Ireland that Cromwell in 1655 found it necessary to recall him. He was honored shortly afterwards, however, by being nominated one of the fourteen major-generals to whom the internal administration of the Commonwealth was entrusted. On the death of the Lord Protector he made an attempt, by means of his influence with the troops, to supplant Richard Cromwell: but he wanted sufficient ability and energy to carry out his purpose, and in the midst of his intrigues the nation recalled the exiled Stuarts. Fleetwood's prominent position marked him out as an object of vengeance to the restored king, and it was only with very great difficulty that he escaped with his life. Not long after the Restoration he died in wretchedness and obscurity at Stoke Newington, whither he had retired. That defect in his character which helped to ruin both him and the Protectorate did not escape the shrewd observation of Cromwell, who, in a letter written shortly after Fleetwood's marriage to Bridget Cromwell, gives him the exhortation, "Take heed of your natural inclination to compliance."

FLEETWOOD, William (1656–1723), a learned English bishop, was descended of an ancient family in Lancashire, and was born in the Tower of London, January 21, 1656. He received his education at Eton and at King's College, Cambridge. About the time of the Revolution he entered into holy orders, and was shortly afterwards made rector of St. Austin's, London, and lecturer of St. Dunstan's in the West. He became canon of Windsor in 1702, and in 1706 he was nominated to the see of St. Asaph, from which he was translated in 1714 to that of Ely. He died at Tottenham, Middlesex, on the 4th August, 1723. Bishop Fleetwood was regarded as the best preacher of his time, and his character stood deservedly high in general estimation. In liberal and enlightened piety he was considerably in advance of his age.

His principal writings are—*Essay on Miracles*, 1701; *Chronicum Preciosum*, 1707; and *Free Sermons*, 1712, containing sermons on the death of Queen Mary, the duke of Gloucester, and King William. A collected edition of his works was published in 1737.

FLEMING, Paul (1609–1640), a German poet, was born at Hartenstein, a village in Saxony, on October 5, 1609. His father, a clergyman, was transferred while Paul was still a child to a higher post at Wechselburg; and here, on the charming banks of the Mulda, Fleming grew to boyhood, being treated with great affection by a kind and intelligent stepmother. From about the age of fourteen he attended school in Leipsic, and five or six years later he became a student at the university of that town. He was a youth of manly and generous character, and soon gave evidence of poetical talent in the occasional verses he was already fond of writing. He had many friends among his fellow-students, and keenly enjoyed his life in Leipsic; but in 1633 he was driven away by the horrors of the Thirty Years' War. It happened that about this time the duke of Holstein had resolved to send an embassy to Persia, with the view of opening for his subjects new channels of trade. Through Olearius, who was made secretary of the embassy, and afterwards wrote an interesting account of its proceedings, the young poet heard of the duke's purpose. Fired by the prospect of foreign travel, and with a vague idea that great results might be achieved by bringing East and West into closer contact, he went to Holstein and offered the duke his services. The offer was accepted; and when, a few months later, the embassy started, Fleming accompanied it as a subordinate official. Difficulties arose at Moscow, and the chiefs of the expedition returned to Holstein for instructions, leaving the inferior members, among them Fleming, at Revel. Here they were detained for more than a year, but he had no reason to regret the fact, since there were in Revel many cultivated German families who received him with pleasure. In the spring of 1636 the embassy set off anew, and it was absent rather more than three years, reaching Ispahan in 1637, and passing through many stirring adventures on the way. The pleasure of the enterprise was marred by the tyrannical disposition of one of the leaders; but if we may judge from the buoyant tone of the poems written during the journey, Fleming must have had many happy hours amid the strange scenes he visited. In April, 1639 he found himself once more in Revel, and as a lady who had promised to become his wife had married during his absence, he now wooed a certain Fräulein Anna, who had been too young during his former visit to attract his notice. At Leipsic he had attended lectures in medicine, and after his betrothal it occurred to him to settle in Revel as a physician. He went to Leyden, and obtained a diploma; but the fatigues of travel had helped to undermine his constitution, and on his way back to Revel he died at Hamburg, April 2, 1640, when little more than thirty years of age.

His fame was not very great in his own day; but it has steadily increased ever since, and he is now universally admitted to have been the most brilliant German poet of the 17th century. After the Reformation, poetry almost died out in Germany; it could not make itself heard amid the noise of contending theological sects. Martin Opitz, the founder of the so-called First Silesian school, heralded the approach of a new literary epoch. Fleming began his career as a disciple of this author, whose methods of versification he adopted; and without being aware of it he speedily rose far above his master. The younger poet had genius, of which there is no trace in the correct but tedious compositions of Opitz. Some of the rudeness of his age still clung to Fleming; but his feeling is always intense, and he often gives it voice in lines of exquisite melody. Although he does not seem to have searched laboriously for appropriate epithets, he is justly famous for the wealth, aptness, and beauty of his phraseology. His genius was purely lyrical, and he never sought to pass beyond the limits which nature had imposed upon him. Within these limits, however, the range of his *Geist und Weltliche Poëmata* is unusually wide. In his religious poetry—notably in the well-known hymn beginning "In allen meinen Thaten"—the sorrows of a generation tormented by a fearful war found pathetic utterance; but this did not hinder him from writing some of the gayest and most alluring love verses in the German language. His sonnets breathe a spirit of lofty independence, betokening a mind which has grappled seriously with the hardest problems of life, but which has lost none of the confidence, ardor, and charm of youth.

Fleming's writings were admirably edited by the late T. M. Lappenberg. As, however, a large number of them relate to special events, and the poet did not always succeed in giving these events an ideal interest, most readers will be satisfied with the ample selection from his works in the second volume of the series entitled *Deutsche Dichter des siebzehnten Jahrhunderts*, edited by K. Gödeke and J. Tittman (Leipsic, 1870). A valuable study of the poet will be found in Varnhagen von Ense's *Biographischen Denkmalen*, bd. iv. (Berlin, 1826).

FLEMISH LITERATURE. See Holland.

FLEMMING, or Flemmynge, Richard (died 1431), bishop of Lincoln, and founder of Lincoln College, Oxford, was born at Crofton in Yorkshire. He was descended from a good family, and was educated at University College, Oxford. Having taken his degrees, he was made prebendary of York in 1406, and the next year was one of the proctors of the university. At this period of his life he embraced the doctrines of Wickliffe, and by his earnest advocacy won over many persons, some of high rank, to the side of the Reformer. But by some means a change was wrought in him, and he not only ceased to speak against the corruptions of the Roman system, but became one of Wickliffe's most determined opponents. Before 1415 he was instituted to the rectory of Boston in Lincolnshire, and in 1420 he was consecrated bishop of Lincoln. In 1424 he attended the council of Siena, a continuation of the council of Constance, and in the presence of the pope, Martin V., made an eloquent speech in vindication of his native country. It was probably on this occasion that he was named chamberlain to the pope. To Bishop Flemming was intrusted the execution of the decree of the council for the exhumation and burning of Wickliffe's remains. The see of York being vacant, the pope conferred it on Flemming; but in consequence of the vehement opposition of Henry V. to the project, it was given up, and Flemming remained bishop of Lincoln. In 1427 he obtained the royal license empowering him to found a college at Oxford for the special purpose of training up disputants against Wickliffe's heresy. While the work was in progress the founder died at his palace at Sleaford, January 26, 1431. Lincoln College was, however, completed by his trustees, and its endowments were afterwards augmented by various benefactors.

FLENSBURG, or Flensborg, the capital of a circle in the government district of Schleswig-Holstein, Prussia, is situated at the head of the Flensburg Ford, 20 miles north by west of Schleswig. It is the most important commercial town in what was formerly the duchy of Schleswig, and possesses several wharfs, a large shipbuilding yard, breweries, distilleries, foundries, oil-mills, sailcloth and paper manufactories, glass-works, copper-works, soap-works, and rice-mills. It has a number of vessels engaged in the West India trade, and in the Greenland whale fishery; and it also carries on a considerable oyster trade. The principal public buildings are the market houses, the exchange, the theatre, the real school, the agricultural school, and the hospital. The cemetery is interesting as containing the remains of the Danish soldiers who fell in the battle of Idstedt (25th July, 1850). A marble headstone has been placed at each grave—officers and common soldiers—with the same simple inscription on each, after the name and rank, "Fell at Idstedt." The colossal Lion monument, erected by the Danes to commemorate the victory of Idstedt, was removed to Berlin in 1864. Flensburg was founded in the 12th century, and received the privileges of a town from King Waldemar in 1284. The population in 1875 was 26,525.

FLETCHER, Andrew (1653–1716), of Saltoun, a prominent figure in Scotch history during the latter half of the 17th century, was born in 1653 at his ancestral home in East Lothian, and for five years was taught by the celebrated Gilbert Burnet, who was then minister of the parish of Saltoun. On reaching manhood he visited the Continent, where he spent several years in travel and study. In 1681 he was returned as commissioner for his native county to the Scottish parliament, where he distinguished himself by such determined opposition to the arbitrary measures of the court that he was forced to seek refuge in Holland, while sentence of outlawry (with confiscation of his estates) was passed against him. Four years later he joined the expedition of the duke of Monmouth; but on their landing at Lyme in Dorsetshire, he had the misfortune to kill the mayor of the town in a quarrel, and was compelled once more to seek safety abroad. During the second period of exile he travelled in disguise through Spain, where he had some romantic adventures. He next made a tour through Hungary, where he fought as a volunteer in a Turkish campaign; and finally at the Hague he took an active part in forwarding the scheme of the English Revolution. In 1688 he returned to Scotland when he at once regained his estates, and also sat as a member in the Scottish convention and afterwards in the parliament. An enemy of the monarchical form of government, he began to oppose the ministry of William almost as stoutly as he had resisted that of Charles; and that he exercised power in parliament is shown by the triumphant passing of the Act of Security of 1703, which, ripened under his care, contained two important constitutional laws restraining the power of the monarch of making war without the consent of parliament, and providing that all places and offices should be given by parliament. During the years of negotiations, as leader of the national party, he was consistent in his objections to the projected terms of the union of the crowns of England and Scotland, and supported his measure of limitations in animated speeches. After the Union he retired from public life; but in 1710 he did his country a real if homely service by introducing from Holland the art of making pot barley, and also the use of fanners for sifting grain. He died in London in 1716. A contemporary describes him as a "low, thin man, of a brown complexion; full of fire; with a stern, sour look.' Among the small band of good early Scotch prose authors he holds a prominent place, and in the domain of politics he is the most readable and entertaining of them all. His style has the singular freshness of foreign culture, and, charged with strong feeling, his sentences frequently turn into forcible epigrams. But both his writings and his speeches possess a value beyond that of literary excellence; they afford us bright glimpses of the manners and state of the country of his time. In literature his name is best known in connection with an often quoted remark, which occurs in *An Account of a Conversation concerning a right Regulation of Governments for the Common Good of Mankind:*—"I said I knew a very wise man so much of Sir Christopher's [Musgrave] sentiment, that he believed if a man were permitted to make all the ballads he need not care who should make the laws of a nation. And we find that most of the ancient legislators thought they could not well reform the manners of any city without the help of a lyric, and sometimes of a dramatic poet."

See *The Political Works of Andrew Fletcher, Esq.*, Glasgow, 1749, to which estimates of his character by Rawlinson and Lockhart are prefixed; *Essay on his Life and Writings*, by the Earl of Buchan, 1792; *Historical Account of the Ancient Rights and Power of the Parliament of Scotland*, 1823, a labored, interesting treatise, first published anonymously and now attributed to Fletcher.

FLETCHER, Giles (1548–1610), LL.D., father of the poets Giles and Phineas Fletcher, was himself a very distinguished man. He was born at Watford, in 1548; he studied at Cambridge, and after a stormy youth represented Winchelsea in parliament in 1585. In 1587 he travelled in Holland and Germany, and spent 1588–89 in Russia. In 1591 he printed his singular work, *The Russ Commonwealth*, which was suppressed for fear of angering the czar; in 1593 he brought out a volume of poems entitled *Licia*. He died in 1610.

FLETCHER, Giles (1584–1623), English poet of the 17th century, was born in London about 1584. He was the second son of Dr. Giles Fletcher, nephew of Richard Fletcher, bishop of London, cousin of John Fletcher the dramatist, and younger brother of Phineas Fletcher. He went very young to Cambridge, and as early as 1603 he contributed a poem on the death of Queen Elizabeth to a volume entitled *Sorrow's Joy*. He was a bachelor of divinity of Trinity College, and remained at the university until 1617 or later. In 1610 he published his great poem of *Christ's Victory and Triumph*, of which a second edition appeared in 1632. In 1612 he edited the *Remains* of his cousin Nathanial Pownoll. It is not known in what year he was ordained, but he became a famous preacher from the pulpit of St. Mary's, and was popular for the florid religious rhetoric then in vogue. He left Cambridge to accept, it is supposed from the hand of Lord Bacon, the rectory of Alderton, on the coast of Suffolk, where "his clownish and low-parted parishioners valued not their pastor according to his worth, which disposed him to melancholy and hastened his dissolution." In 1623 he published *The Reward of the Faithful*, a theological treatise in prose, and died in the same year, leaving a widow. The principal work by which Giles Fletcher is known is one of the most remarkable religious poems in the language. Its full title is *Christ's Victory and Triumph, in Heaven, in Earth, over and after Death.* It is in four cantos, divided according to the suggestion of the title; the metre is an eight-line stanza adapted from the Spenserian by the omission of the seventh line. Giles Fletcher, like his brother Phineas, was a disciple of Spenser, whom he follows with more vigor and brilliance than any poet of his time. His style has much more nervous strength, terseness, and melody than his brother's, and he had his subject far more thoroughly under control. In his very best passages Giles Fletcher attains to a rare sublimity, and to a rich voluptuous music which charmed the ear of Milton. It was his misfortune to live in an age which considered the poems of Marini and Gongora insuperable, and he strives too often to outdo these his patterns in grotesque conceit. But when he is carried away by his theme, and forgets to be ingenious, he attains an extraordinary solemnity and harmony of style. His description of the Lady of Vain Delight, in the second canto, has been greatly admired; the portrait of Justice is even nobler still, and of the first order of poetry. Milton did not hesitate to borrow very considerably from the *Christ's Victory and Triumph* in his *Paradise Regained.* Fletcher died in 1623.

The poetical writings of the Giles Fletchers, father and son, have been edited by Dr. A. B. Grosart, who has succeeded in clearing up a great deal of the obscurity that till lately lay around their careers. The *Russ Commonwealth* has been reprinted and edited by Mr. Bond. The prose works of Giles Fletcher the younger have never been reprinted.

FLETCHER, John (1579–1625). See Beaumont and Fletcher.

FLETCHER, Phineas (1582–c. 1665), English poet, and brother of Giles Fletcher the younger, was the eldest son of Dr. Giles Fletcher. He was born at Cranbrook, in Kent, in April, 1582. He was admitted a scholar of Eton, and in 1600 entered King's College, Cambridge. In 1603 he contributed verses to *Sorrow's Joy.* He was in priest's orders in 1611. In 1614 his pastoral drama of *Sicelides* was acted before the university. He left Cambridge to become chaplain to Sir Henry Willoughby in 1616; the same patron presented him in 1621 with the rectory of Hilgay in Norfolk; in the same year he married. He named his eldest son Edmund, in honor, no doubt, of Edmund Spenser, for whom he preserved an intense admiration. In 1627 he published his long poem, in Latin and English, of *Locustæ, or the Apollyonists*, a furious invective against the Jesuits. Next year appeared a fine but sensuous poem, entitled *Britain's Ida*, which was attributed on the title-page to Spenser; but many critics, and particularly Dr. A. B. Grosart, consider it to be the work of Phineas Fletcher. The drama of *Sicelides* was printed in 1631. In 1632 he brought out a theological treatise in prose, entitled *Joy in Tribulation*, and in 1633 his *magnum opus*, the famous poem of *The Purple Island.* His *Piscatory Eclogues* and *Miscellaneous Poems* appeared on the same occasion. It is believed that in 1650 he was ejected from his living, but nothing is known of the date or circumstances of his death. In the preface to his posthumous prose work, *A Father's Testament*, published in 1670, he is spoken of as having been some years dead. The *Purple Island, or the Isle of Man*, is a poem in twelve cantos, describing in cumbrous allegory the whole physiological and intellectual construction of the human body. The veins are spoken of as rivers, the bones as mountains, and the ingenuity as well as scientific knowledge displayed is very considerable. The manner of Spenser is preserved throughout, though not so closely as to destroy the distinct flavor of original genius. The allegory itself is found very tedious and prosaic at the present day; but some of the reflective passages, and the rich jewelled descriptions of Arcadian scenery possess living charm. Five cantos are occupied with the phenomena of the body, and seven with those of the mind. The *Piscatory Eclogues* have nothing to do with fishing; they are simply pastorals in the usual style, the characters being supposed to be fisher-boys reposing by the river Cam. The poetry of Phineas Fletcher never approaches the occasional sublimity of that of his brother Giles; it carries the Marini manner to a still more tasteless excess; but it is generally fluent, luxurious, and lacking neither color nor music.

A very complete edition of the poetical works of Phineas Fletcher, in 4 vols., was privately printed by Dr. Grosart in 1868. It is the only careful reprint that has been issued.

FLEURANGES, Robert (III.) de la Marck, Seigneur de (1491–1537), marshal of France, historian, was born of an ancient family at Sedan in 1491. A fondness for military exercises displayed itself in his earliest years, and at the age of ten he was sent to the court of Louis XII., and placed in charge of the count of Angoulême, afterwards King Francis I. In his twentieth year he married a niece of the Cardinal d'Amboise, but after three months he quitted his home to join the French army in the Milanese. With a handful of troops he threw himself into Verona, then besieged by the Venetians; but the siege was protracted, and being impatient for more active service, he rejoined the army. He then took part in the relief of Mirandola, besieged by the troops of Pope Julius II., and in other actions of the campaign. In 1512, the French being driven from Italy, Fleuranges was sent into Flanders to levy a body of 10,000 men, in command of which, under his father, he returned to Italy in 1513, seized Alexandria, and vigorously assailed Novara. But the French were defeated, and Fleuranges narrowly escaped with his life, having received more than forty wounds. He was rescued by his father and sent to Vercellæ, and thence to Lyons Returning to Italy with Francis I. in 1515, he distinguished himself in various affairs, and especially at Marignano, where he had a horse shot under him, and contributed so powerfully to the victory of the French that the king knighted him with his own hand. He next took Cremona, and was there called home by the news of his father's illness. In 1519 he was sent into Germany on the difficult errand of inducing the electors to give their votes in favor of Francis I.; but in this he failed. The war in Italy being rekindled, Fleuranges accompanied the king thither, fought at Pavia (1525), and was taken prisoner with his royal master. The emperor sent him into confinement in Flanders, where he remained for some years. During this imprisonment he was created marshal of France. He employed his enforced leisure in writing his *Histoire des choses mémorables advenues du règne de Louis XII. et de François I., depuis 1499 jusq' en l'an 1521.* In this work he designates himself *Jeune Adventureux.* Within a small compass he gives many curious and interesting details of the time, writing only of what he had seen, and in a very simple but vivid style. The book was first published in 1735, by Abbé Lambert, who added historical and critical notes; and it has been reprinted in several collections. The last occasion on which Fleuranges was engaged in active service was at the defence of Peronne, besieged by the count of Nassau in 1536. In the following year he heard of his father's death, and set out from Amboise for his estate of La Marck; but he was seized with illness at Longjumeau, and died there in December, 1537.

FLEUR-DE-LIS, an heraldic device. Concerning its origin the most diverse theories have been broached. According to an old tradition, it was first employed as an armorial bearing by Clovis I., and represents the lily presented by an angel to that monarch at his baptism, the three fleurs-de-lis of his shield being the sign of the Trinity. Newton (*Display*, p. 145) considers it to be the figure of a reed or flag in blossom, used instead of a sceptre at the proclamation of the Frankish kings. In the opinion of Chifflet, the device was first adopted by Louis VII. of France, surnamed le Jeune, in allusion to his name Louis Florus. Some, again, have held that it is the extremity of the *francisque*, a kind of javelin anciently used in France. An objection fatal to the above and other theories assigning to the fleur-de-lis a purely French origin is that it was early an ornament of the sceptres, seals, and robes, not only of the Merovingian, but of Greek, Roman, German, Spanish, and English kings, and was a symbol employed by many noble families in various parts of Europe in the 12th and 13th centuries. It is stated to occur, very perfectly sculptured, in the head-dresses of Egyptian sphinxes (*Notes and Queries*, 2d ser., i. p. 226). Gioja of Amalphi is said by Moreri to have marked the north end of the needle of the mariner's compass with a fleur-de-lis in honor of the king of Naples; but see Compass, vol. vi. pp. 200 and 202. Since the 12th century the fleur-de-lis, or "flower-de-luce" (Shakespeare), has been employed as the symbol of royalty in France.

See Heraldry; Berry, *Encyclopædia Heraldica*, vol. i., 1828; Boutell, *Heraldry*, 1865; and Larousse, *Dictionnaire Universel du XIX^{e} Siècle*, t. viii.

FLEURY, André Hercule de (1653–1743), cardinal, the celebrated minister of Louis XV. of France, was born in 1653 at Lodève, in Languedoc. He was educated by the Jesuits at Paris, and became successively almoner to Marie Thérèse, queen of Louis XIV., in 1698 bishop of Fréjus, and in 1715 preceptor to the young prince, who afterwards succeeded to the throne as Louis XV. On the death of the regent Orleans in 1723, Fleury advised his royal pupil to choose the duke of Bourbon as minister, and was himself made a member of the council. In 1726, being then in his seventy-third year, he received a cardinal's hat, and was called to the office of prime minister, which he held till his death in 1743. At the time when Fleury was entrusted with the direction of affairs, the condition of France was truly deplorable. The nation was impoverished and worn out, and the exchequer emptied by the long wars of the Grand Monarque and the extravagances of the regent. Commerce was annihilated, public credit ruined, the Government held in contempt, and the church distracted by internal dissensions. Fleury immediately set himself to the task, and effected important reforms. Though he was a confirmed friend to peaceful measures, he was twice driven by court intrigues to take part in foreign wars,—first in the case of Stanislaus Leczinsky, the dethroned king of Poland, whose daughter Louis XV. had married; and afterwards in that of the Austrian Succession, of which he did not live to see the end. In these wars, his economy, which bordered on avarice, was fatal to the cause espoused by France. The navy, neglected for fear of the expense, was no longer equal to any emergency. The Polish war he had energy neither to avert nor to carry on effectively. The meanly equipped expedition which he sent to the coasts of Pomerania could not but fail, notwithstanding the heroism displayed at Dantzic by the count of Plélo and his 1500 soldiers. One of the most useful acts of Fleury's administration was the completion of the Royal (now the National) Library, which he enriched with many valuable manuscripts, chiefly in the Oriental languages. He was a scholar of considerable attainments. The French Academy elected him as a member in 1717, the Academy of Sciences followed this example in 1721, and the Academy of the Inscriptions et Belles-Lettres in 1725. He was also provisor of Sorbonne, and superior of the college of Navarre.

Bibliography.—F. J. Bataille, *Éloge historique de M. le Cardinal A. H. de Fleury*, Strasburg, 1737, 8vo; Ch. Frey de Neuville, *Oraison funèbre de S. E. Mgr. le Cardinal A. H. Fleury*, Paris, 1743, 4to; Ph, Vicaire, *Oraison funèbre du Cardinal A. H. de Fleury*, Caen, 1743, 4to; M. van Hoey, *Lettres et négotiations pour servir à l'histoire de la vie du Cardinal de Fleury*, Londres, 1743, 8vo; *Leben des Cardinals A. H. Fleury*, Freiburg, 1743, 8vo; Fr. Morénas, *Parallèle du ministère du Cardinal Richelieu et du Cardinal de Fleury*, Avignon, 1743, 12mo; *Nachrichten von dem Leben und der Verwaltung des Cardinals Fleury*, Hamburg, 1744, 8vo.

FLEURY, Claude (1640–1723), the famous ecclesiastical historian, was born at Paris, December 6, 1640. Destined for the bar by his father, he was placed at the college of Clermont (now that of Louis-le-Grand), where the sons of the first families of France were educated. After passing brilliantly through the regular collegiate studies, he was nominated an advocate to the parliament of Paris in 1658, and continued during nine years to pursue the legal profession. Feeling a strong desire to enter the church, being fond of solitude, but especially influenced by the religious sentiments which he had imbibed during his early education, he renounced the law—which with history and literature, up to this time had formed the principal objects of his study—in order to devote himself to theology exclusively. He had already been some time in holy orders, when Louis XIV., in 1672, selected him as tutor of the princes of Conti; and so well did he acquit himself in this office, that the king intrusted to him afterwards the education of the count of Vermandois, one of his natural sons; and at the death of the young prince, Fleury received as recompense for his services the abbey of Loc-Dieu, in the diocese of Rhodez. Five years after this (1689) he was appointed sub-preceptor of the dukes of Burgundy, of Anjou, and of Berri. He thus became intimately associated with Fénelon, the chief preceptor of his royal pupils. In 1696 he was selected to fill the place of La Bruyère in the French Academy; and on the completion of the education of the young princes, the king bestowed upon him the rich priory of Argenteuil, in the diocese of Paris (1706). On assuming this benefice he resigned that of the abbey of Loc-Dieu, thus setting an example of rare disinterestedness. It was about this time that he decided, according to the suggestions of his friends, on commencing his great work, for which he had been collecting materials for thirty years—the *Histoire Ecclésiastique.* Hitherto France did not possess any work of equal merit in this department of literature. There existed many works more or less voluminous on matters of doctrine and discipline; but no one had written a history of the church,—a complete and scientific exposition of the progress of Christian society, of its organization and its primitive doctrine, of its varied changes in connection with the state, of the successive development of its institutions, of all the modifications introduced into its symbols and its rites. Fleury had evidently the intention of writing a history of the church for all classes of society; but at the time in which his great work appeared it was less religion than theology that absorbed the attention of the clergy and the educated public; and his work, as well as all those that had been published previously, is therefore more a work for the student than one for the people, dwelling as it does very particularly on questions of doctrine, of discipline, of supremacy, and of rivalry between the priesthood and the imperial power while it notices very slightly general questions affecting religion and morality. This fault, which was then looked upon as a merit, secured to the *Histoire Ecclésiastique* a very great success. The first edition, printed at Paris in 20 volumes 4to, 1691, was followed by many others, among which may be mentioned that of Brussels, in 32 vols. 8vo, 1692, and that of Nismes, in 25 vols. 8vo, 1778 to 1780. The work of Fleury only comes down to the year 1414. It was continued by J. Claude Fabre and Goujet down to 1595, in 16 vols. 4to. In consulting the work of Fleury and its supplement, the general table of contents, published by Rondel, Paris, 1758, 1 vol. 4to, will be found very useful. Translations have been made of the entire work into Latin, German, and Italian. The Latin translation, published at Augsburg, 1758-59, 85 vols. 8vo, carries the work down to 1684. Fleury, who had been appointed confessor to the king in 1716, died in 1723.

Fleury left many works besides his *Histoire Ecclésiastique*. The following deserve special mention :—*Histoire du Droit françois*, 1674, 12mo ; *Catéchisme historique*, 1679, 12mo ; *Mœurs des Israélites*, 1681, 12mo ; *Mœurs des Chrétiens*, 1682, 12mo ; *Traité du choix et de la méthode des études*, 1686, 2 vols. 12mo ; *Institution du Droit ecclésiastique*, 1687, 2 vols. 12mo ; *Les Devoirs des maîtres et des domestiques*, 1688, 12mo. The Roman Congregation of the Index has condemned the *Catéchisme historique* and the *Institution du Droit ecclésiastique*. The books to be specially consulted on Fleury's biography are—Chr. Ernst Simonetti, *Der Character eines Geschichtsschreibers in dem Leben und aus den Schriften des Abbts C. Fleury*, Göttingen, 1746, 4to ; J. F. Lebret, *Dissertatio de C. Fleuryo, Gallo-catholico au acatholico*, Tübingen, 1800, 4to; Chr. F. Ph. Jaeger, *Notice sur C. Fleury, considéré comme historien de l'Église*, Strasburg, 1847, 8vo.

FLIEDNER, THEODORE (1800-1864) a German philanthropist and restorer of the office of deaconess to the Protestant Church of Germany, was born January 21, 1800, at Eppstein, a small village on the frontiers of Hesse and Nassau, where his father was parish clergyman. He early showed a preference for the pastoral office, to qualify himself for which he studied at the universities of Giessen and Göttingen, and at the theological seminary of Herborn. At the age of twenty he passed his final examination ; and after a year spent in teaching and preaching, he accepted a call from the Evangelical Church at Kaiserswerth, a little town on the Rhine a few miles below Düsseldorf. His stipend was only £27, and the failure, soon after he was settled, of a large firm of velvet manufacturers, which supplied a large proportion of the members of his congregation, rendered even this small sum no longer secure. To provide an endowment for his church, he undertook journeys through part of Germany, and then to Holland and England. He met with considerable success, and had opportunities of observing what was being done in those countries towards prison reform, a subject which soon attracted his attention. The German prisons were then in a very bad state. The prisoners were huddled together in dirty rooms, were badly fed, and were left in complete idleness. No one dreamed of instructing them or of collecting statistics to form the basis of useful legislation on the subject. Fliedner at first singly undertook the work. He applied for permission to be imprisoned for some time, in order that he might look at prison life from the inside. This petition was refused, but he was allowed to hold fortnightly services in the Düsseldorf prison, and to visit the inmates individually. The work grew. Those interested in the subject banded themselves together, and on June 18, 1826, the first Prison Society of Germany was founded. The fact was clearly recognized that if any permanent good was to be done, the prisoners must be looked after on their release ; and therefore in 1833 Fliedner opened at Kaiserswerth a refuge for discharged female convicts. His circle of practical philanthropy rapidly increased. The state of the sick poor had for some time excited his interest, and it seemed to him that hospitals might be best served by an organized body of women specially trained and devoted to the work. Accordingly, in 1836 he began the first deaconess house, and the hospital at Kaiserswerth. By their ordination vows the deaconesses devoted themselves to the care of the poor, the sick, and the young. They were to be dressed in a plain uniform without distinctive badge, and their engagements were not final—they might leave their work and return to ordinary life if they chose. To these institutions Fliedner added in 1836 an infant school, then a normal school for infant school mistresses, an orphanage for orphan girls of the middle class (1842), and an asylum for female lunatics (1847). Besides these, he assisted at the foundation and in the management of various similar institutions not only in Germany, but in different parts of Europe.

In 1849 he resigned his pastoral charge, and from 1849 to 1851 he travelled over a large part of Europe, America, and the East,—the object of his journeys being to found "mother houses," which might not merely be training-schools for deaconesses, but also centres whence other training-establishments might arise. He established a deaconess house in Jerusalem, and after his return assisted by counsel and money in the erection of establishments at Constantinople, Smyrna, Alexandria, and Bucharest. Among his later efforts may be mentioned the Christian house of refuge for female servants in Berlin (connected with which other institutions soon arose) and the "house of evening rest" for retired deaconesses at Kaiserswerth. These and similar labors wore out a naturally strong constitution, and in 1856 he visited the East for the sake of his health. He returned worse rather than better, and thereafter was for the most part confined to his room ; he continued, however, by correspondence to promote the objects of his life. He died October 4, 1864, leaving behind him over 100 stations attended by 430 deaconesses ; and these by 1876 had increased to 150 with an attendance of 600.

In 1855 Fliedner received the degree of doctor in theology from the university of Bonn, in recognition rather of his practical activity than his theological attainments. He scarcely seems, indeed, to have concerned himself with the great controversies which during his lifetime agitated the German Church, his whole life being devoted to steady, well-directed, and eminently successful efforts to benefit the poor, the weak, and the suffering. His character was marked by prompt decision, clear insight, and great practical sagacity. Nor was it without traits of quaint Teutonic humor, which relieved its sterner features.

Fliedner's writings are almost entirely of a practical character. He edited a periodical, *Der Armen und Kranken Freund*, which contained information regarding the various institutions, and also the yearly almanac of the Kaiserswerth institution. Besides purely educational and devotional works, he wrote *Buch der Märtyrer ; Nachricht über das Diakonissen-Werk in der Christ. Kirche ; Die evangel. Märtyrer Ungarns und Siebenbürgens ;* and *Beschreibung der Reise nach Jerusulem und Constantinopel*. All were published at Kaiserswerth. There is a translation of the German life, prepared by the family, by C. Winkworth (London, 1867). On Fliedner and his work see also *Kaiserswerth Deaconesses*, London, 1857 ; Dean Howson's *Deaconesses*, London, 1862 ; *The Service of the Poor*, by E. C. Stephen, London, 1871 ; Stevenson's *Praying and Working*, London, 1865.

FLIGHT, FLYING MACHINES. Of the many scientific problems of modern times, there are few possessing a wider or more enduring interest than that of aërial navigation. To fly has always been an object of ambition with man ; nor will this occasion surprise when we remember the marvellous freedom enjoyed by volant as compared with non-volant animals. The traditions of Dædalus and Icarus illustrate the attempts in the past ; and at the present day societies exist in Britain, France, Austria, and other countries, for the purpose of solving, if possible, the knotty problem. These societies embrace men of the highest scientific attainments, and as they evince great activity, and publish their proceedings at regular intervals, it is not too much to expect that the problem of artificial flight will be actually solved, or at least much simplified. For the first time in the history of the world, the subject of aërial navigation has been taken up in earnest by practical men with the necessary degree of preliminary knowledge and training. Investigators no longer dream about flight : they experiment upon and work towards it. It is, they maintain, a physical problem to be solved by mechanical skill and ingenuity. But while writing thus hopefully, it is necessary to state that as yet no one has succeeded in constructing a fully equipped flying machine. The number of successful flying models, however, is so considerable as to inspire the cultivators of aëronautical science with a very confident hope of success.

The object of the present article is threefold—(1) to demonstrate the laws of natural flight ; (2) to expound the principles on which a flying machine should be constructed ; and (3) to chronicle some of the more important attempts at aërostation in modern times.

It is not necessary to enter upon a history of artificial flight. This has already been done in the article AERONAUTICS, to which the reader is referred. The fact is that aërostation in its modern form dates back only a very few years. It will suffice, then, if the modern discoveries are recorded in the order of time as we proceed.

The subject of aërostation is admitted on all hands to be one of extreme difficulty. To tread upon the air (and this is what is really meant) is, at first sight, in the highest degree utopian; and yet there are thousands of living creatures which actually accomplish this feat. These creatures, however varied in form and structure, all fly according to one and the same principle; and this is a significant fact, as it tends to show that the air must be attacked in a particular way to ensure flight. The flying machine of the future, there can be no doubt, will be constructed on the type of flying animals,—the insect, bird, and bat. It behoves us then at the outset to scrutinize very carefully the general configuration of flying animals, and in particular the size, shape, and movements of their flying organs.

Flying animals, it may be premised, differ entirely from sailing ships and from balloons, with which they are not unfrequently though erroneously compared; and a flying machine constructed upon proper principles can have nothing in common with either of those creations. The ship floats upon water and the balloon upon air; but the ship differs from the balloon, and the ship and the balloon differ from the flying creature and flying machine. The water and air, moreover, have characteristics of their own. The analogies which connect the water with the air, the ship with the balloon, and the ship and the balloon with the flying creature and flying machine are false analogies. A sailing ship is supported by the water and requires merely to be propelled; a flying creature and a flying machine constructed on the living type require to be both supported and propelled. This arises from the fact that water is much denser than air, and because water supports on its surface substances which fall through air.

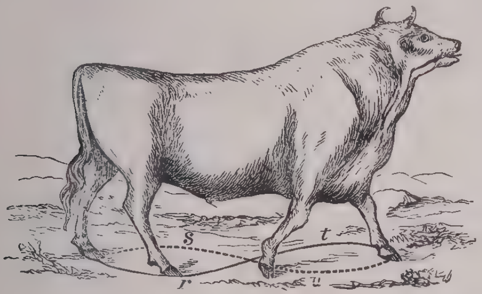

Fig. 1.

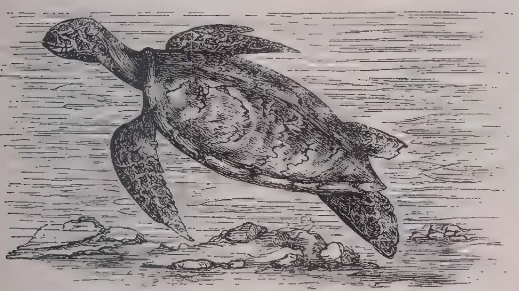

Fig. 2.

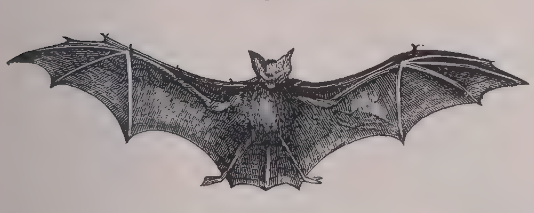

Fig. 3.

FIG. 1.—Chillingham Bull (*Bos Scoticus*). Small travelling extremities adapted for land. *r*, *s*, *t*, *u*, figure-of-8 described by the feet in walking. (Pettigrew, 1867.)

FIG. 2.—The Turtle (*Chelonia imbricata*). Enlarged travelling extremities (flippers) adapted for water. (Pettigrew, 1867.)

FIG. 3.—The Bat (*Phyllocina gracilis*). Greatly expanded travelling extremities adapted for air. (Pettigrew, 1867.)

While water and air are both to be regarded as fluid media, they are to be distinguished from each other in the following particulars. Water is comparatively very heavy, inelastic, and incompressible; air, on the other hand, is comparatively very light, elastic, and compressible. If water be struck with violence, the recoil obtained is great when compared with the recoil obtained from air similarly treated. In water we get a maximum recoil with a minimum of displacement; in air, on the contrary, we obtain a minimum recoil with a maximum of displacement. Water and air when unconfined yield readily to pressure. They thus form *movable fulcra* to bodies acting upon them. In order to meet these peculiarities the travelling organs of aquatic and flying animals (whether they be feet, fins, flippers, or wings) are made not of rigid but of elastic materials. The travelling organs, moreover, increase in size in proportion to the tenuity of the fluid to be acted upon. The difference in size of the travelling organs of animals becomes very marked when the land animals are contrasted with the aquatic, and the aquatic with the aërial, as in figs 1, 2, and 3.

The peculiarities of water and air as supporting media are well illustrated by a reference to swimming, diving, and flying birds. A bird when swimming extends its feet simultaneously or alternately in a backward direction, and so obtains a forward recoil. The water supports the bird, and the feet simply propel. In this case the bird is lighter than the water, and the long axis of the body is horizontal (*a* of fig. 4). When the bird dives, or flies under water, the long axis of the body is inclined obliquely downwards and forwards, and the bird forces itself into and beneath the water by the action of its feet, or wings, or both. In diving or subaquatic flight the feet strike upwards and backwards, the wings downwards and *backwards* (*b* of fig. 4). In aërial flying everything is reversed. The long axis of the bird is inclined obliquely upwards and forwards, and the wings strike, not downwards and backwards, but downwards and *forwards* (*c* of fig. 4). These changes in the direction of the long axis of the bird in swimming, diving, and flying, and in the direction of the stroke of the wings in subaquatic and aërial flight, are due to the fact that the bird is heavier than the air and lighter than the water.

The physical properties of water and air explain in a great measure how the sailing ship differs from the balloon, and how the latter differs from the flying creature and flying machine constructed on the natural type. The sailing ship is, as it were, immersed in two oceans,—viz. an ocean of water and an ocean of air—the former being greatly heavier and denser than the latter. The ocean of water buoys or floats the ship, and the ocean of air, or part of it in motion, swells the sails which propel the ship. The moving air which strikes the sails directly strikes the hull of the vessel indirectly and forces it through the water, which, as explained, is a comparatively dense fluid. When the ship is in motion it can be steered either by the sails alone, or by the rudder alone, or by both combined. A balloon differs from a sailing ship in being immersed in only one ocean, viz., the ocean of air. It resembles the ship in floating upon the air, as the ship floats upon the water; in other words, the balloon is lighter than the air, as the ship is lighter than the water. But here all analogy ceases. The ship, in virtue of its being immersed in two fluids having different densities, can be steered and made to tack about in a horizontal plane in any given direction. This in the case of the balloon, immersed in one fluid, is impossible. The balloon in a calm can only rise and fall in a vertical line. Its horizontal movements, which ought to be the more important, are accidental movements due to air currents, and cannot be controlled; the balloon, in short, cannot be guided. One might as well attempt to steer a boat carried along by currents of water in the absence of oars, sails, and wind, as to steer a balloon carried along by currents of air. The balloon has no hold upon the air, and this consequently cannot be employed as a *fulcrum* for regulating its course. The balloon, because of its vast size and from its being lighter than the air, is completely at the mercy of the wind. It forms an integral part, so to speak, of the wind for the time being, and the direction of the wind in every instance determines the horizontal motion of the balloon. The force required to propel a balloon against even a moderate breeze would result in its destruction. The balloon cannot be transferred with any degree of certainty from one point of the earth's surface to another, and hence the chief danger in its employment. It may, quite as likely as not, carry its occupants out to sea. The balloon is a mere lifting machine. It has no analogue in nature, and, as its history sufficiently shows, is incapable of improvement.

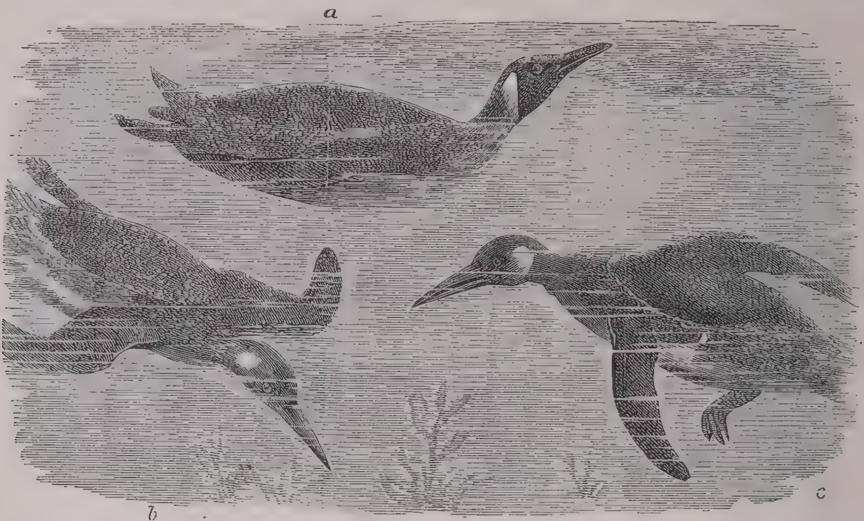

Fig. 4.—The King Penguin in the positions assumed by a bird in (*a*) swimming, (*b*) diving, and (*c*) flying. (Pettigrew.)

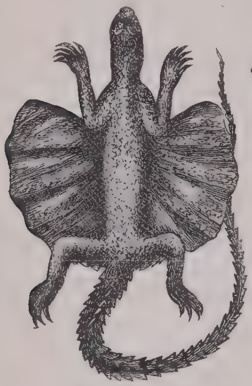

Fig. 5.

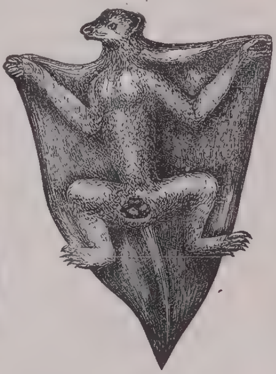

Fig. 6.

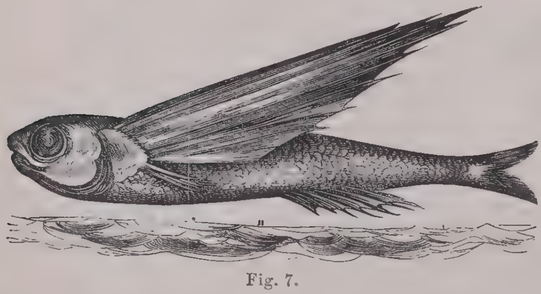

Fig. 7.

Fig. 5.—The Red-throated Dragon (*Draco hæmatopogon*). (Pettigrew, 1867.)
Fig. 6.—The Flying Colugo (*Galeopithecus volans*); also called flying lemur and flying squirrel. (Pettigrew, 1867.)
Fig. 7.—The Flying Fish (*Exocœtus exiliens*). (Pettigrew, 1867.)

The balloon, as is well known, was introduced by the Montgolfier brothers in 1782. It was first inflated by heated air obtained by burning trusses of straw under it, then by hydrogen gas, and lastly by coal gas. It is in no sense to be regarded a flying machine. It resembles the flying creature only in this, that it is immersed in the ocean of air in which it sustains itself. The mode of suspension is wholly different. The balloon floats because it is lighter than the air; the flying creature floats because it extracts from the air, by the vigorous downward action of its wings, a certain amount of upward recoil. The balloon is passive; the flying creature is active. The balloon is controlled by the wind; the flying creature controls the wind. The balloon in the absence of wind can only rise and fall in a vertical line; the flying creature can fly in a horizontal plane in any given direction. The balloon is inefficient because of its levity; the flying creature is efficient because of its weight.

Weight, however paradoxical it may appear, is necessary to flight. Everything which flies is vastly heavier than the air. The inertia of the mass of the flying creature enables it to control and direct its movements in the air. Many are of opinion that flight is a mere matter of levity and power. This is quite a mistake. No machine, however light and powerful, will ever fly whose travelling surfaces are not properly fashioned and properly applied to the air.

It was supposed at one time that the air sacs of birds contributed in some mysterious way to flight, but this is now known to be erroneous. The bats and some of the best flying birds have no air sacs. Similar remarks are to be made of the heated air imprisoned within the bones of certain birds.[1] Feathers even are not necessary to flight. Insects and bats have no feathers, and yet fly well. The only facts in natural history which appear even indirectly to countenance the flotation theory are the presence of a swimming bladder in some fishes, and the existence of membranous expansions or pseudo-wings in certain animals, such as the flying fish, flying dragon, and flying squirrel. As, however, the animals referred to do not actually fly, but merely dart into the air and there sustain themselves for brief intervals, they afford no real support to the theory. The so-called floating animals are well depicted at figs. 5, 6, and 7.

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[1] According to Dr. Crisp, the swallow, martin, snipe, and many birds of passage have no air in their bones.—*Proc. Zool. Soc., Lond.*, part xxv., 1857, p. 13.

It has been asserted, and with some degree of plausibility, that a fish lighter than the water might swim, and that a bird lighter than the air might fly; it ought, however, to be borne in mind that, in point of fact, a fish lighter than the water could not hold its own if the water were in the least perturbed, and that a bird lighter than the air would be swept into space by even a moderate breeze without hope of return. Weight and power are always associated in living animals, and the fact that living animals are made heavier than the medium they are to navigate may be regarded as a conclusive argument in favor of weight being necessary alike to the swimming of the fish and the flying of the bird. It may be stated once for all that flying creatures are for the most part as heavy, bulk for bulk, as other animals, and that flight in every instance is the product, not of superior levity, but of *weight* and *power* directed upon properly constructed flying organs.

This fact is important as bearing on the construction of flying machines. It shows that a flying machine need not necessarily be a light, airy structure exposing an immoderate amount of surface. On the contrary, it favors the belief that it should be a compact and moderately heavy and powerful structure, which trusts for elevation and propulsion entirely to its flying appliances—whether actively moving wings, or screws, or aëro-planes wedged forward by screws. It should attack and subdue the air, and never give the air an opportunity of attacking or subduing it. It should smite the air intelligently and as a master, and its vigorous well-directed thrusts should in every instance elicit an upward and forward recoil. The flying machine of the future, there is reason to believe, will be a veritable example of "*multum in parvo*." It will launch itself in the ocean of air, and will extract from that air, by means of its travelling surfaces—however fashioned and however applied—the recoil or resistance necessary to elevate and carry it forward. Extensive inert surfaces indeed are contra-indicated in a flying machine, as they approximate it to the balloon, which, as has been shown, cannot maintain its position in the air if there are air currents. A flying machine which could not face air currents would necessarily be a failure. To obviate this difficulty we are forced to fall back upon *weight*, or rather the structures and appliances which weight represents. These appliances as indicated should not be unnecessarily expanded, but when expanded they should, wherever practicable, be converted into actively moving flying surfaces, in preference to fixed or inert dead surfaces.

The question of surface is a very important one in aërostation; it naturally resolves itself into one of active and passive surface. As there are active and passive surfaces in the flying animal, so there are, or should be, active and passive surfaces in the flying machine. Art should follow nature in this matter. The active surfaces in flying creatures are always greatly in excess of the passive ones, from the fact that the former virtually increase in proportion to the spaces through which they are made to travel. Nature not only distinguishes between active and passive surfaces in flying animals, but she strikes a just balance between them, and utilizes both. She regulates the surfaces to the strength and weight of the flying creature and the air currents to which the surfaces are to be exposed and upon which they are to operate. In her calculations she never forgets that her flying subjects are to control and not to be controlled by the air. As a rule she reduces the passive surfaces of the body to a minimum; she likewise reduces as far as possible the actively moving or flying surfaces. While, however, diminishing the surfaces of the flying animal as a whole, she increases as occasion demands the active or wing surfaces by wing movements, and the passive or dead surfaces by the forward motion of the body in progressive flight. She knows that if the wings are driven with sufficient rapidity they practically convert the spaces through which they move into solid bases of support; she also knows that the body in rapid flight derives support from all the air over which it passes. The manner in which the wing surfaces are increased by the wing movements will be readily understood from the accompanying illustrations of the blow fly with its wings at rest and in motion (figs. 8 and 9). In fig. 8 the surfaces exposed by the body of the insect and the wings are, as compared with those of fig. 9, trifling. The wind would have much less purchase on fig. 8 than on fig. 9, provided the surfaces exposed by the latter were passive or dead surfaces. But they are not dead surfaces; they represent the spaces occupied by the rapidly vibrating wings, which are actively moving flying organs. As, moreover, the wings travel at a much higher speed than any wind that blows, they are superior to and control the wind; they enable the insect to dart through the wind in whatever direction it pleases.

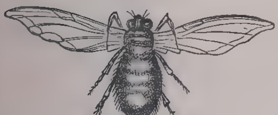

Fig. 8.

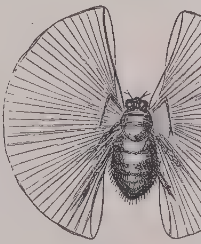

Fig. 9.

Fig. 8.—Blow Fly (*Musca vomitoria*) with its wings at rest. (Pettigrew.)
Fig. 9.—Blow Fly with its wings in motion as in flight. (Pettigrew.)

The reader has only to imagine figs. 8 and 9 cut out in paper to realize that extensive, inert, horizontal aëro-planes[1] in a flying machine would be a mistake. It is found to be so practically, as will be shown by and by. Fig. 9 so cut out would be heavier than fig. 8, and if both were exposed to a current of air, fig. 9 would be more blown about than fig. 8.

It is true that in beetles and certain other insects there are the elytra or wing cases—thin, light, horny structures—which in the act of flight are extended horizontally and act as sustainers or gliders. The elytra, however, are comparatively long narrow structures which occupy a position in front of the wings, of which they may be regarded as forming the anterior parts. The elytra are to the delicate wings of some insects what the thick anterior margins are to stronger wings. The elytra, moreover, are not wholly passive structures. They can be moved, and the angles made by their under surfaces with the horizon adjusted. Finally, they are not essential to flight, as flight in the great majority of instances is performed without them. The elytra serve as protectors to the wings when the wings are folded upon the back of the insect, and as they are extended horizontally when the insect is flying they contribute to flight indirectly, in virtue of their being carried forward by the body in motion.

The manner in which the wings of the insect traverse the air, so as practically to increase the basis of support, raises the whole subject of natural flight. It is necessary, therefore, at this stage to direct the attention of the reader somewhat fully to the subject of flight, as witnessed in the insect, bat, and bird,—a knowledge of natural flight preceding, and being in some senses indispensable to, a knowledge of artificial flight.

The bodies of flying creatures are, as a rule, very strong, comparatively light, and of an elongated form,—the bodies of birds being specially adapted for cleaving the air. Flying creatures, however, are less remarkable for their strength, shape, and comparative levity than for the size and extraordinarily rapid and complicated movements of their wings. To Professor J. Bell Pettigrew is due the merit of having first satisfactorily analyzed those movements, and of having reproduced them by the aid of artificial wings. This physiologist in 1867[2] showed that all natural wings, whether of the insect, bat, or bird, are screws structurally, and that they act as screws when they are made to vibrate, from the fact that they twist in opposite directions during the down and up strokes. He also explained that all wings act upon a common principle, and that they present oblique, kite-like surfaces to the air, through which they pass much in the same way that an oar passes through water in sculling. He further pointed out that the wings of flying creatures (contrary to received opinions, and as has been already indicated) strike downwards and forwards during the down strokes, and upwards and forwards during the up strokes. Lastly, and most important of all, he demonstrated that the wings of flying creatures, when the bodies of said creatures are fixed, describe *figure-of-8 tracks* in space,—the figure-of-8 tracks, when the bodies are released and advancing as in rapid flight, being opened out and converted into *waved tracks*.

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[1] By the term aëro-plane is meant a thin, light, expanded structure intended to float or rest upon the air, and calculated to afford a certain amount of support to any body attached to it.

[2] "On the various modes of Flight in relation to Aëronautics," by J. Bell Pettigrew, M.D., F.R.S., etc. (*Proceedings of the Royal Institution of Great Britain*, March 22d, 1867): "On the Mechanical Appliances by which Flight is attained in the Animal Kingdom," by the same author (*Transactions of the Linnæan Society*, vol. xxvi., read June 6th and 20th, 1867).

Professor Pettigrew's discovery of the figure-of-8 and waved movements, concerning which so much has been said and written, was confirmed some two years after it was made by Professor E. J. Marey[1] by the aid of the "sphygmograph."[2] The movements in question are now regarded as fundamental, from the fact that they are alike essential to natural and artificial flight.

The following is Professor Pettigrew's description of wings and wing movements published in 1867:—

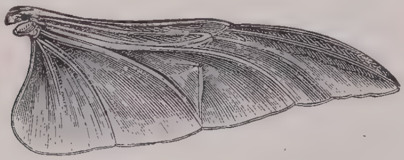

Fig. 10.

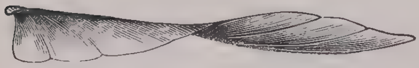

Fig. 11.

FIG. 10.—Right wing of the Beetle (*Goliathus micans*) when at rest; seen from above. (Pettigrew, 1867.)

FIG. 11.—Right wing of the Beetle (*Goliathus micans*) when in motion; seen from behind. This figure shows how the wing twists and untwists when in action, and how it forms a true screw. (Pettigrew, 1867.)

"The wings of insects and birds are, as a rule, more or less triangular in shape, the base of the triangle being directed towards the body, its sides anteriorly and posteriorly. They are also conical on section from within outwards and from before backwards, this shape converting the pinions into delicately-graduated instruments balanced with the utmost nicety to satisfy the requirements of the muscular system on the one hand and the resistance and resiliency of the air on the other. While all wings are graduated as explained, innumerable varieties occur as to their general contour, some being falcated or scythe-like, others oblong, others rounded or circular, some lanceolate, and some linear. The wings of insects may consist either of one or two pairs,—the anterior or upper pair, when two are present, being in some instances greatly modified and presenting a corneous condition. They are then known as elytra, from the Greek ἔλυτρον, a sheath. Both pairs are composed of a duplicature of the integument or investing membrane, and are strengthened in various directions by a system of hollow, horny tubes, known to entomologists as the neuræ or nervures. These nervures taper towards the extremity of the wing, and are strongest towards its root and anterior margin, where they supply the place of the arm in bats and birds. The neuræ are arranged at the axis of the wing after the manner of a fan or spiral stair—the anterior one occupying a higher position than that farther back, and so of the others. As this arrangement extends also to the margins, *the wings are more or less twisted upon themselves*, and present a certain degree of convexity on their superior or upper surface, and a corresponding concavity on their inferior or under surface—their free edges supplying those fine curves which act with such efficacy upon the air in obtaining the maximum of resistance and the minimum of displacement. As illustrative examples of the form of wings alluded to, those of the beetle, bee, and fly may be cited—the pinions in those insects acting as *helices*, or *twisted levers*, and elevating weights much greater than the area of the wings would seem to warrant" (figs. 10 and 11). . . . "To confer on the wings the multiplicity of movements which they require, they are supplied with double hinge or compound joints, which enable them to move not only in an upward, downward, forward, and backward direction, but also at various intermediate degrees of obliquity. An insect with wings thus hinged may, as far as steadiness of body is concerned, be not inaptly compared to a compass set upon gimbals, where the universality of motion in one direction ensures comparative fixedness in another." . . . "All wings obtain their leverage by presenting oblique surfaces to the air, the degree of obliquity gradually increasing in a direction from behind, forwards and downwards, during extension when the sudden or effective stroke is being given, and gradually decreasing in an opposite direction during flexion, or when the wing is being more slowly recovered preparatory to making a second stroke. The effective stroke in insects, and this holds true also of birds, is therefore delivered *downwards and forwards*, and not, as the majority of writers believe, vertically, or even slightly backwards. . . . The wing in the insect is more flattened than in the bird; and advantage is taken on some occasions of this circumstance, particularly in heavy-bodied, small-winged, quick-flying insects, *to reverse the pinion more or less completely during the down and up strokes*." . . . "This is effected in the following manner. The posterior margin of the wing is made to rotate, during the down stroke, in a direction from above downwards and from behind forwards,—the anterior margin travelling in an opposite direction and reciprocating. The wing may thus be said to attack the air by a *screwing movement* from above. During the up or return stroke, on the other hand, the posterior margin rotates in a direction from below upwards and from before backwards, so that by a similar but *reverse screwing motion* the pinion attacks the air from beneath." . . . "*A figure-of-8*, compressed laterally and placed obliquely with its long axis running from left to right of the spectator, represents the movements in question. *The down and up strokes*, as will be seen from this account, *cross each other*, the wing smiting the air during its descent from above, as in the bird and bat, and during its ascent from below as in the flying fish and boy's kite" (fig. 12).

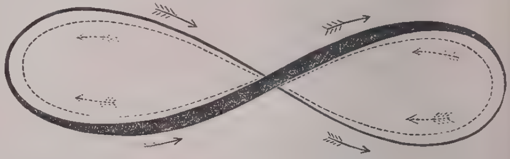

FIG. 12 shows the figure-of-8 made by the margins of the wing in extension (continuous line), and flexion (dotted line). As the tip of the wing is midway between its margins, a line between the continuous and dotted lines gives the figure-of-8 made by the tip. The arrows indicate the reversal of the planes of the wing, and show how the down and up strokes *cross each other*. (Pettigrew, 1867.)

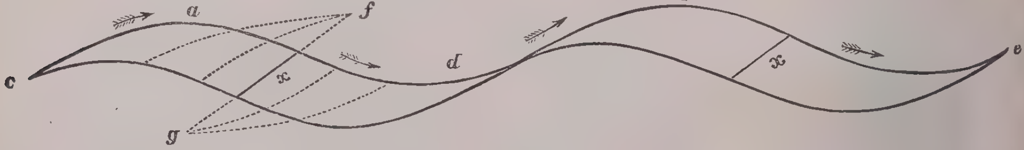

FIG. 13.—Wave track made by the wing in progressive flight. *a*, *b*, crests of the wave; *c*, *d*, *e*, up strokes; *x*, *x*, down strokes; *f*, point corresponding to the anterior margin of the wing, and forming a centre for the downward rotation of the wing (*a*, *g*); *g*, point corresponding to the posterior margin of the wing, and forming a centre for the upward rotation of the wing (*d*, *f*). (Pettigrew, 1867.)

. . . "The figure-of-8 action of the wing explains how an insect or bird may fix itself in the air, the backward and forward reciprocating action of the pinion affording support, but no propulsion. In these instances the backward and forward strokes are made to counterbalance each other. Although the figure-of-8 represents with considerable fidelity the twisting of the wing upon its axis during extension and flexion, when the insect is playing its wings before an object, or still better when it is artificially fixed, it is otherwise when the down stroke is added and the insect is fairly on the wing and progressing rapidly. In this case the wing, in virtue of its being carried forward by the body in motion, describes an undulating or spiral course. as shown in fig. 13."

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[1] *Revue des Cours Scientifiques de la France et de l'Étranger*, 1869.

[2] The sphygmograph, as its name indicates, is a recording instrument. It consists of a smoked cylinder revolving by means of clock work at a known speed, and a style or pen which inscribes its surface by scratching or brushing away the lampblack. The movements to be registered are transferred to the style or pen by one or more levers, and the pen in turn transfers them to the cylinder, where they appear as legible tracings. In registering the movements of the wings, the tips and margins of the pinions were, by an ingenious modification, employed as the styles or pens. By this arrangement the different parts of the wings were made actually to record their own movements. As will be seen from this account, the figure-of-8 or wave theory of stationary and progressive flight has been made the subject of a rigorous *experimentum crucis*.

. . . "The down and up strokes are compound movements—the termination of the down stroke embracing the beginning of the up stroke, and the termination of the up stroke including the beginning of the down stroke. This is necessary in order that the down and up strokes may glide into each other in such a manner as to prevent jerking and unnecessary retardation."[1] . . .

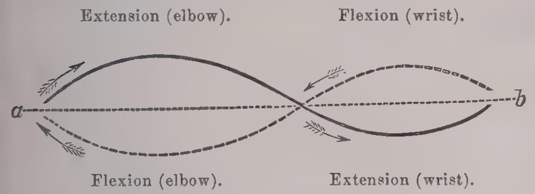

FIG. 14.—*a*, *b*, line along which the wing travels during extension and flexion. The arrows indicate the direction in which the wing is spread out in extension and closed or folded in flexion. (Pettigrew, 1867.)

"The wing of the bird, like that of the insect, is concavo-convex, and *more or less twisted upon itself* when extended, so that the anterior or thick margin of the pinion presents a different degree of curvature to that of the posterior or thin margin. This twisting is in a great measure owing to the manner in which the bones of the wing are twisted upon themselves, and the spiral nature of their articular surfaces,—the long axes of the joints always intersecting each other at right angles, and the bones of the elbow and wrist making a quarter of a turn or so during extension and the same amount during flexion. As a result of this disposition of the articular surfaces, the wing may be shot out or extended, and retracted or flexed in nearly the same plane, the bones composing the wing rotating on their axes during either movement (fig. 14). The secondary action or the revolving of the component bones on their own axes, is of the greatest importance in the movements of the wing, as it communicates to the hand and forearm, and consequently to the primary and secondary feathers which they bear, the precise angles necessary for flight. It in fact ensures that the wing, and the curtain or fringe of the wing which the primary and secondary feathers form, shall be screwed into and down upon the wind in extension, and unscrewed or withdrawn from the wind during flexion. The wing of the bird may therefore be compared to a huge gimlet or auger, the axis of the gimlet representing the bones of the wing, the flanges or spiral thread of the gimlet the primary and secondary feathers" (figs. 15 and 16). . . . "From this description it will be evident that by the mere rotation of the bones of the forearm and hand the maximum and minimum of resistance is secured much in the same way that this object is attained by the alternate dipping and feathering of an oar." . . . "The wing, both when at rest and when in motion, may not inaptly be compared to the blade of an ordinary screw propeller as employed in navigation. Thus the general outline of the wing corresponds closely with the outline of the propeller (figs. 11, 16, and 18), and the track described by the wing in space *is twisted upon itself* propeller fashion[2] (figs. 12, 20, 21, 22, 23). The great velocity with which the wing is driven converts the impression or blur into what is equivalent to a solid for the time being, in the same way that the spokes of a wheel in violent motion, as is well understood, more or less completely occupy the space contained within the rim or circumference of the wheel" (figs. 9, 20, and 21).

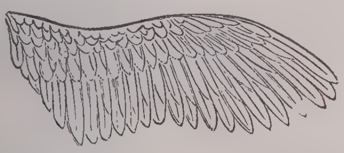

FIG. 15.—Right wing of the Red-legged Partridge (*Perdix rubra*). Dorsal aspect as seen from above. (Pettigrew, 1867.)

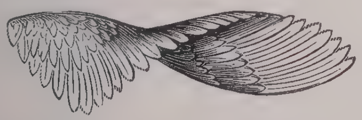

FIG. 16.—Right wing of the Red-legged Partridge (*Perdix rubra*). Dorsal and ventral aspects as seen from behind; showing auger-like conformation of wing. Compare with figs. 11 and 18. (Pettigrew, 1867.)

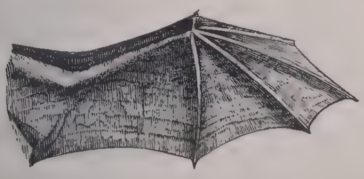

FIG. 17.—Right wing of the Bat (*Phyllocina gracilis*). Dorsal aspect as seen from above. (Pettigrew, 1867.)

. . . "The wing of the bat bears considerable resemblance to that of the insect, inasmuch as it consists of a delicate, semi-transparent, continuous membrane, supported in divers directions, particularly towards its anterior margin, by a system of stays or stretchers which confer upon it the degree of rigidity requisite for flight. It is, as a rule, deeply concave on its under or ventral surface, and in this respect resembles the wing of the heavy-bodied birds. The movement of the bat's wing in extension is a *spiral* one, the spiral running alternately from below upwards and forwards and from above downwards and backwards. The action of the wing of the bat, and the movements of its component bones, are essentially the same as in the bird" (figs. 17 and 18).

. . . "The wing strikes the air precisely as a boy's kite would if it were jerked by its string, the only difference being that the kite is *pulled forwards* upon the wind by the string and the hand, whereas in the insect, bat, and bird the wing is *pushed forwards* on the wind by the weight of the body and the power residing in the pinion itself" (fig. 19).[3]

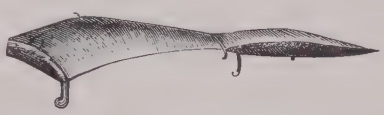

FIG. 18.—Right wing of the Bat (*Phyllocina gracilis*). Dorsal and ventral aspects, as seen from behind. These show the screw-like configuration of the wing, and also shows how the wing twists and untwists during its action. (Pettigrew, 1867.)

The figure-of-8 and kite-like action of the wing referred to lead us to explain how it happens that the wing, which in many instances is a comparatively small and delicate organ, can yet attack the air with such vigor as to extract from it the recoil necessary to elevate and propel the flying creature. The accompanying figures from one of Professor Pettigrew's more recent memoirs[4] will serve to explain the *rationale* (figs. 20, 21, 22, and 23).

As will be seen from these figures, the wing during its vibration sweeps through a comparatively very large space.

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[1] This continuity of the down into the up stroke and the converse is greatly facilitated by the elastic ligaments at the root or in the substance of the wing. These assist in elevating, and, when necessary, in flexing and elevating it. They counteract in some measure what may be regarded as the dead weight of the wing, and are especially useful in giving it continuous play.

[2] "The importance of the twisted configuration or screw-like form cannot be over-estimated. That this shape is intimately associated with flight is apparent from the fact that the rowing feathers of the wing of the bird are every one of them distinctly spiral in their nature; in fact, one entire rowing feather is equivalent—morphologically and physiologically—to one entire insect wing. In the wing of the martin, where the bones of the pinion are short, and in some respects rudimentary, the primary and secondary feathers are greatly developed, and banked up in such a manner that the wing as a whole presents the same curves as those displayed by the insect's wing, or by the wing of the eagle, where the bones, muscles, and feathers have attained a maximum development. The conformation of the wing is such that it presents a waved appearance in every direction,—the waves running longitudinally, transversely, and obliquely. The greater portion of the wing may consequently be removed without essentially altering either its form or its functions. This is proved by making sections in various directions, and by finding that in some instances as much as two-thirds of the wing may be lopped off without materially impairing the power of flight" (*Trans. Roy. Soc. Edin.*, vol. xxvi. pp. 325, 326).

[3] "On the various modes of Flight in relation to Aëronautics" (*Proceedings of the Royal Institution of Great Britain*, March 22d, 1867); "On the Mechanical Appliances by which Flight is attained in the Animal Kingdom" (*Transactions of the Linnean Society*, vol. xxvi., read June 6th and 20th, 1867), by J. Bell Pettigrew, M.D., F.R.S., Professor of Medicine and Anatomy, University of St. Andrews.

[4] "On the Physiology of Wings; being an analysis of the movements by which flight is produced in the Insect, Bat, and Bird" (*Trans. Roy. Soc. Edin.*, vol. xxvi.).

This space, as already explained, is practically a solid basis of support for the wing and for the flying animal. The wing attacks the air in such a manner as virtually to have no slip,—this for two reasons. The wing reverses instantly and acts as a kite during nearly the entire down and up strokes. The angles, moreover, made by the wing with the horizon during the down and up strokes are at no two intervals the same, but (and this is a remarkable circumstance) they are always adapted to the speed at which the wing is travelling for the time being. The increase and decrease in the angles made by the wing as it hastens to and fro are due partly to the resistance offered by the air, and partly to the mechanism and mode of application of the wing to the air. The wing, during its vibrations, rotates upon two separate centres, the tip rotating round the root of the wing as an axis (short axis of wing), the posterior margin rotating around the anterior margin (long axis of wing). The wing is really eccentric in its nature, a remark which applies also to the rowing feathers of the bird's wing. The compound rotation goes on throughout the entire down and up strokes, and is intimately associated with the power which the wing enjoys of alternately seizing and evading the air.

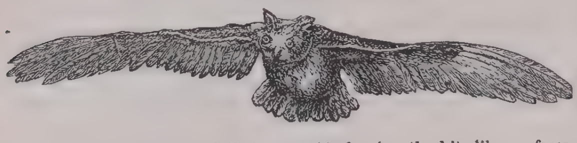

Fig. 19.—The Cape Barn-owl (*Strix capensis*), showing the kite-like surfaces presented by the ventral aspect of the wings and body in flight. (Pettigrew, 1867.)

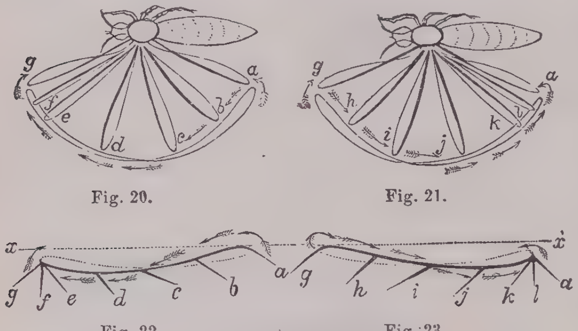

Fig. 20. Fig. 21.

Fig. 22. Fig. 23.

Figs. 20, 21, 22, and 23 show the area mapped out by the left wing of the Wasp when the insect is fixed and the wing made to vibrate. These figures illustrate the various angles made by the wing with the horizon as it hastens to and fro, and show how the wing reverses and reciprocates, and how it twists upon itself in opposite directions, and describes a figure-of-8 track in space. Figs. 20 and 22 represent the forward or down stroke (*a b c d e f g*), figs. 21 and 23 the backward or up stroke (*g h i j k l a*). The terms forward and back strokes are here employed with reference to the head of the insect. *x x′*, line to represent the horizon. If fig. 22, representing the down or forward stroke, be placed upon fig. 23, representing the up or backward stroke, it will be seen that *the wing crosses its own track* more or less completely at every stage of the down and up strokes. (Pettigrew, 1870.)

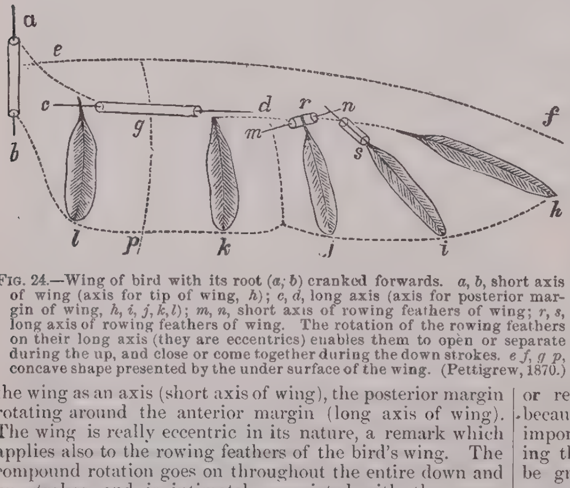

Fig. 24.—Wing of bird with its root (*a*, *b*) cranked forwards. *a*, *b*, short axis of wing (axis for tip of wing, *h*); *c*, *d*, long axis (axis for posterior margin of wing, *h*, *i*, *j*, *k*, *l*); *m*, *n*, short axis of rowing feathers of wing; *r*, *s*, long axis of rowing feathers of wing. The rotation of the rowing feathers on their long axis (they are eccentrics) enables them to open or separate during the up, and close or come together during the down strokes. *e f*, *g p*, concave shape presented by the under surface of the wing. (Pettigrew, 1870.)

The compound rotation of the wing is greatly facilitated by the wing being elastic and flexible. It is this which causes the wing to twist and untwist diagonally on its long axis when it is made to vibrate. The twisting referred to is partly a vital and partly a mechanical act;—that is, it is occasioned in part by the action of the muscles and in part by the greater resistance experienced from the air by the tip and posterior margin of the wing as compared with the root and anterior margin,—the resistance experienced by the tip and posterior margin causing them to reverse always subsequently to the root and anterior margin, which has the effect of throwing the anterior and posterior margins of the wing into figure-of-8 curves, as shown at figs. 9, 11, 12, 16, 18, 20, and 21.

The compound rotation of the wing, as seen in the bird, is represented in fig. 24.

Not the least curious feature of the wing movements is the remarkable power which the wing possesses of making and utilizing its own currents. Thus, when the wing descends it draws after it a strong current, which, being met by the wing during its ascent, greatly increases the efficacy of the up stroke. Similarly and conversely when the wing ascends, it creates an upward current, which, being met by the wing when it descends, powerfully contributes to the efficiency of the down stroke. This statement can be readily verified by experiment both with natural and artificial wings. Neither the up nor the down strokes are complete in themselves.

The wing to act efficiently must be driven at a certain speed, and in such a manner that the down and up strokes shall glide into each other. It is only in this way that the air can be made to pulsate, and that the rhythm of the wing and the air waves can be made to correspond. The air must be seized and let go in a certain order and at a certain speed to extract a maximum recoil. The rapidity of the wing movements is regulated by the size of the wing, small wings being driven at a very much higher speed than larger ones. The different parts of the wing, moreover, are made to travel at different degrees of velocity—the tip and posterior margin of the wing always rushing through a much greater space in a given time than the root and anterior margin.

The rapidity of travel of the insect wing is in some cases enormous. The wasp, for instance, is said to ply its wings at the rate of 110, and the common housefly at the rate of 330 beats per second. Quick as are the vibrations of natural wings, the speed of certain parts of the wing is amazingly increased. Wings as a rule are long and narrow. As a consequence, a comparatively slow and very limited movement at the root confers great range and immense speed at the tip, the speed of each portion of the wing increasing as the root of the wing is receded from. This is explained on a principle well understood in mechanics, viz., that when a wing or rod hinged at one end is made to move in a circle, the tip or free end of the wing or rod describes a much wider circle in a given time than a portion of the wing or rod nearer the hinge (fig. 25).

One naturally inquires why the high speed of wings and why the progressive increase of speed at their tips and posterior margins. The answer is not far to seek. If the wings were not driven at a high speed, and if they were not eccentrics made to revolve upon two separate axes, they would of necessity be large cumbrous structures; but large heavy wings would be difficult to work, and what is worse, they would (if too large), instead of controlling the air, be controlled by it, and so cease to be flying organs.

There is, however, another reason why wings should be made to vibrate at high speeds. The air, as explained, is a very light thin, elastic medium, which yields on the slightest pressure, and unless the wings attacked it with great violence the necessary recoil or resistance could not be obtained. The atmosphere, because of its great tenuity, mobility, and comparative imponderability, presents little resistance to bodies passing through it at low velocities. If, however, the speed be greatly accelerated, the action of even an ordinary cane is sufficient to elicit a recoil. This comes of the action and reaction of matter, the resistance experienced varying according to the density of the atmosphere and the shape, extent, and velocity of the body acting upon it. While, therefore, scarcely any impediment is offered to the progress of an animal in motion in the air, it is often exceedingly difficult to compress the air with sufficient rapidity and energy to convert it into a suitable fulcrum for securing the onward impetus. This arises from the fact that bodies moving in air experience a *minimum of resistance* and occasion a *maximum of displacement*. Another and very obvious difficulty is traceable to the great disparity in the weight of air as compared with any known solid, and the consequent want of buoying or sustaining power which that disparity involves. If we compare air with water we find it is nearly 1000 times lighter. To meet these peculiarities the insect, bat, and bird are furnished with extensive flying surfaces in the shape of wings, which they apply with singular velocity and power to the air, as levers of the third order. In this form of lever, as the reader is aware, the power is applied between the fulcrum and the weight to be raised. The power is represented by the wing, the fulcrum by the air, and the weight by the body of the flying animal. Although the third order of lever is particularly inefficient when the fulcrum is rigid and immobile, it possesses singular advantages when these conditions are reversed, that is, when the fulcrum, as happens with the air, is *elastic* and *yielding*. In this instance a very slight movement at the root of the pinion, or that end of the lever directed towards the body, is followed by an immense sweep of the extremity of the wing, where its elevating and propelling power is greatest,—this arrangement insuring that the large quantity of air necessary for propulsion and support shall be compressed under the most favorable conditions.

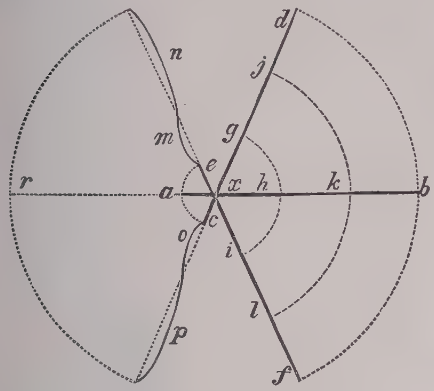

Fig. 25 shows how different portions of the wing travel at different degrees of speed. In this figure the rod $a\ b$, hinged at x, represents the wing. When the wing is made to vibrate, its several portions travel through the spaces $d\ b\ f$, $j\ k\ l$, $g\ h\ i$, and $e\ a\ c$ in exactly the same interval of time. The part of the wing marked b, and which corresponds with the tip, consequently travels very much more rapidly than the part marked a, which corresponds with the root. $m\ n$, $o\ p$, curves made by the wing at the end of the up and down strokes; r, position of the wing at the middle of the stroke. (Pettigrew, 1870.)

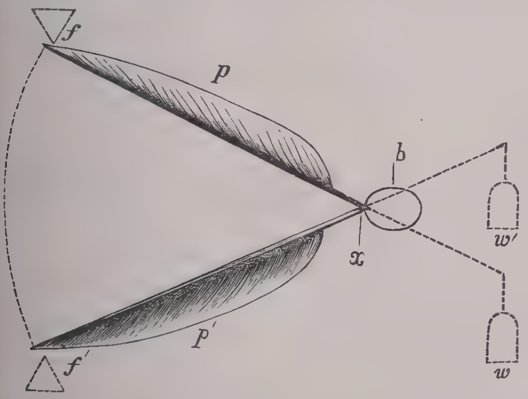

Fig. 26.—In this figure f, f' represent the movable fulcra furnished by the air, p, p' the power residing in the wing, and b the body to be moved. In order to make the problem of flight more intelligible, the lever formed by the wing is prolonged beyond the body (b), and to the root of the wing so extended the weight (w, w') is attached; x represents the universal joint by which the wing is attached to the body. When the wing ascends as shown at p, the air (fulcrum f) resists its upward passage, and forces the body (b) or its representative (w) slightly downwards. When the wing descends as shown at p', the air (fulcrum f') resists its downward passage, and forces the body (b) or its representative (w') slightly upwards. From this it follows that when the wing rises the body falls, and *vice versâ*,—the wing describing the arc of a large circle (f, f'), the body (b), or the weights (w, w') representing it, describing the arc of a small circle. (Pettigrew, 1873.)

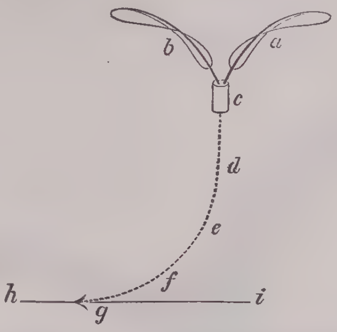

Fig. 27.—a, b, quill feathers; c, cork; d, e, f, g, downward and *forward* curved trajectory made by the feathers and cork before reaching the ground (h, i). (Pettigrew, 1870.)

In this process the weight of the body performs an important part, by acting upon the inclined planes formed by the wings in the plain of progression. The power and the weight may thus be said to reciprocate, the two sitting, as it were, side by side and blending their peculiar influences to produce a common result, as indicated at fig. 26.

When the wings descend they elevate the body, the wings being active and the body passive; when the body descends it contributes to the elevation of the wings,[1] the body being active and the wings passive. It is in this way that weight forms a factor in flight, the wings and the weight of the body reciprocating and mutually assisting and relieving each other. This is an argument for employing four wings in artificial flight,—the wings being so arranged that the two which are up shall always by their fall mechanically elevate the two which are down. Such an arrangement is calculated greatly to conserve the driving power, and, as a consequence, to reduce the weight.

That the weight of the body plays an important part in the production of flight may be proved by a very simple experiment. If two quill feathers are fixed in an ordinary cork, and so arranged that they expand and arch above it, it is found that if the apparatus be dropped from a vertical height of three yards it does not fall vertically downwards, but downwards and *forwards* in a curve, the forward travel amounting in some instances to a yard and a half. Here the cork in falling acts upon the feathers (which are to all intents and purposes wings), and these in turn act upon the air, in such a manner as to produce a horizontal transference. The apparatus which formed the subject of the present experiment is represented at fig. 27.

In order to utilize the air as a means of transit, the body in motion, whether it moves in virtue of the life it possesses, or because of a force superadded, must be heavier than air. It must tread and rise upon the air as a swimmer upon the water, or as a kite upon the wind. This is necessary for the simple reason that the body must be active, the air passive. The flying body must act against gravitation, and elevate and carry itself forward at the expense of the air and of the force which resides in it, whatever that may be. If it were otherwise—if it were rescued from the law of gravitation on the one hand, and bereft of independent movement on the other, it would float about uncontrolled and uncontrollable like an ordinary balloon.

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[1] The other forces which assist in elevating the wings are—(a) the elevator muscles of the wings, (b) the elastic properties of the wings, and (c) the reaction of the compressed air on the under surfaces of the wings.

In flight one of two things is necessary. Either the wings must attack the air with great violence, or the air in rapid motion must attack the wings: either suffices. If a bird attempts to fly in a calm, the wings must be made to smite the air after the manner of a boy's kite with great vigor and at a high speed. In this case the wings fly the bird. If, however, the bird is fairly launched in space and a stiff breeze is blowing, all that is required in many instances is to extend the wings at a slight upward angle to the horizon so that the under parts of the wings present kite-like surfaces. Under these circumstances the rapidly moving air flies the bird. The flight of the albatross supplies the necessary illustration. If by any chance this magnificent bird alights upon the sea he must flap and beat the water and air with his wings with tremendous energy until he gets fairly launched. This done he extends his enormous pinions[1] and sails majestically along, seldom deigning to flap his wings, the breeze doing the work for him. A familiar illustration of the same principle may be witnessed any day when children are engaged in their favorite pastime of kite-flying. If two boys attempt to fly a kite in a calm, the one must hold up the kite and let go when the other runs. In this case the under surface of the kite is made to strike the still air. If, however, a stiff autumn breeze be blowing, it suffices if the boy who formerly ran when the kite was let go stands still. In this case the air in rapid motion strikes the under surface of the kite and forces it up. The string and the hand are to the kite what the weight of the flying creature is to the inclined planes formed by its wings.

Fig. 28.—Hawk and Pigeon.

The area of the insect, bird, and bat, when the wings are fully expanded, is greater than that of any other class of animals, their weight being proportionally less. As already stated, however, it ought never to be forgotten that even the lightest insect, bird, or bat is vastly heavier than the air, and that no fixed relation exists between the weight of body and expanse of wing in any of the orders. We have thus light-bodied and large-winged insects and birds, as the butterfly and heron; and others with heavy bodies and small wings, as the beetle and partridge. Similar remarks are to be made of bats. Those apparent inconsistencies in the dimensions of the body and wings are readily explained by the greater muscular development of the heavy-bodied, small-winged insects, birds, and bats, and the increased power and rapidity with which the wings in them are made to oscillate. This is of the utmost importance in the science of aërostation, as showing that flight may be attained by a heavy powerful animal with comparatively small wings, as well as by a lighter one with greatly enlarged wings. While, therefore, there is apparently no correspondence between the area of the wing and the animal to be raised, there is, unless in the case of sailing insects, birds, and bats, an unvarying relation as to the weight and number of oscillations; so that the problem of flight would seem to resolve itself into one of weight, power, velocity, and small surfaces, *versus* buoyancy, debility, diminished speed, and extensive surfaces,—weight in either case being a *sine qua non.*

That no fixed relation exists between the area of the wings and the size and weight of the body is evident on comparing the dimensions of the wings and bodies of the several orders of insects, bats, and birds. If such comparison be made, it will be found that the pinions in some instances diminish while the bodies increase, and the converse. No practical good can therefore accrue to aërostation from elaborate measurements of the wings and body of any flying thing; neither can any rule be laid down as to the extent of surface required for sustaining a given weight in the air. The statements here advanced are borne out by the fact that the wings of insects, bats, and birds may be materially reduced without impairing their powers of flight. In such cases the speed with which the wings are driven is increased in the direct ratio of the mutilation. The inference to be deduced from the foregoing is plainly this, that even in large-bodied, small-winged insects and birds the wing-surface is greatly in excess, the surplus wing area supplying that degree of elevating and sustaining power which is necessary to prevent undue exertion on the part of the volant animal. In this we have a partial explanation of the buoyancy of insects, and the great lifting power possessed by bats and birds,—the bats carrying their young without inconvenience, the birds elevating surprising quantities of fish, game, carrion, etc. (fig. 28)

While, as explained, no definite relation exists between the weight of a flying animal and the size of its flying surfaces, there being, as stated, heavy-bodied and small-winged insects, bats, and birds, and the converse, and while, as has been shown, flight is possible within a wide range, the wings being, as a rule, in excess of what are required for the purposes of flight,—still it appears from the researches of M. de Lucy that there is a general law, to the effect that the larger the volant animal the smaller by comparison are its flying surfaces. The existence of such a law is very encouraging so far as artificial flight is concerned, for it shows that the flying surfaces of a large, heavy, powerful flying machine will be comparatively small, and consequently comparatively compact and strong. This is a point of very considerable importance, as the object desiderated in a flying machine is elevating capacity.

M. de Lucy has tabulated his results as under:—

Insects.				Birds.			
Names.	Flying Surface referred to the Kilogramme = 2 lb. 8 oz. 3 dwt. 2 gr. avoird. = 2 lb. 3 oz. 4·428 dr. troy.			Names.	Flying Surface referred to the Kilogramme.		
	sq. yds.	ft.	in.		sq. yds.	ft.	in.
Gnat	11	8	92	Swallow	1	1	104½
Dragon-fly (small)	7	2	56	Sparrow	0	5	142½
Coccinella (Lady-bird)	5	13	87	Turtle dove	0	4	100½
Dragon-fly (common)	5	2	89	Pigeon	0	2	113
Tipula, or Daddy-long-legs	3	5	11	Stork	0	2	20
Bee	1	2	74½	Vulture	0	1	116
Meat-fly	1	3	54½	Crane of Australia	0	0	130
Drone (blue)	1	2	20				
Cockchafer	1	2	50				
Lucanus cervus: Stag-beetle (female)	1	1	39½				
Lucanus cervus: Stag-beetle (male)	0	8	33				
Rhinoceros-beetle	0	6	122½				

"It is easy, by the aid of this table, to follow the order, always decreasing, of the surfaces, in proportion as the winged animal increases in size and weight. Thus, in comparing the insects with one another, we find that the gnat, which weighs 460 times less than the stag-beetle, has 14 times more of surface. The lady-bird weighs 150 times less than the stag-beetle, and possesses 5 times more of surface, etc. It is the same with the birds. The sparrow weighs about 10 times less than the pigeon, and has twice as much surface. The pigeon weighs about 8 times less than the stork, and has twice as much surface. The sparrow weighs 339 times less than the Australian crane, and possesses 7 times more surface, etc. If now we compare the insects and the birds, the gradation will become even much more striking. The gnat, for example, weighs 97,000 times less than the pigeon, and has 40 times more surface; it weighs three millions of times less than the crane of Australia, and possesses 140 times more of surface than this latter, the weight of which is about 9 kilogrammes 500 grammes (25 lb. 5 oz. 9 dwt. troy, 20 lb. 15 oz. 2¼ dr. avoirdupois).

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[1] The wings of the albatross, when fully extended, measure some 14 feet. They are exceedingly narrow, being sometimes under a foot in width.

The Australian crane, the heaviest bird weighed, is that which has the smallest amount of surface, for, referred to the kilogramme, it does not give us a surface of more than 899 square centimetres (139 square inches), that is to say, about an eleventh part of a square metre. But every one knows that these grallatorial animals are excellent birds of flight. Of all travelling birds they undertake the longest and most remote journeys. They are, in addition, the eagle excepted, the birds which elevate themselves the highest, and the flight of which is the longest maintained."[1]

The way in which the natural wing rises and falls on the air, and reciprocates with the body of the flying creature, has a very obvious bearing upon artificial flight. In natural flight the body of the flying creature falls slightly forward in a curve when the wing ascends, and is slightly elevated in a curve when the wing descends. The wing and body are consequently always playing at cross purposes, the wing rising when the body is falling and *vice versâ*. The alternate rise and fall of the body and wing of the bird are well seen when contemplating the flight of the gull from the stern of a steamboat, as the bird is following in the wake of the vessel. The complementary movements referred to are indicated at fig. 29, where the continuous waved line represents the trajectory made by the wing, and the dotted waved line that made by the body. As will be seen from this figure, *the wing advances both when it rises and when it falls.* It is a condition of natural wings, and of artificial wings constructed on the principle of living wings, that when forcibly elevated or depressed, even in a strictly vertical direction, they inevitably dart forward. If, for instance, the wing is suddenly depressed in a vertical direction, as at *a b* of fig. 29, it at once darts downwards and forwards (see continuous line of figure) to *c*, thus converting the vertical down stroke into a *down, oblique, forward stroke.* If, again, the wing be suddenly elevated in a strictly vertical direction, as at *c d*, the wing as certainly darts upwards and forwards in a curve to *e*, thus converting the vertical up strokes into an *upward, oblique, forward stroke.* The same thing happens when the wing is depressed from *e* to *f* and elevated from *g* to *h*, the wing describing a *waved track* as at *e g, g i*.

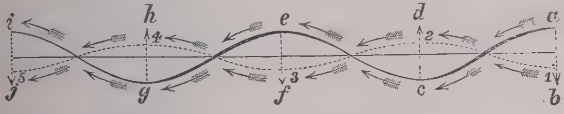

FIG. 29 shows how in progressive flight the wing and the body describe *waved tracks*,—the crests of the waves made by the wing (*a, c, e, g, i*) being placed opposite the crests of the waves made by the body (1, 2, 3, 4, 5). (Pettigrew, 1870.)

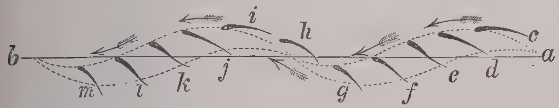

FIG. 30 shows the kite-like action of the wing during the down and up strokes, how the angles made by the wing with the horizon (*a, b*) vary at every stage of these strokes, and how the wing evades the superimposed air during the up stroke, and seizes the nether air during the down stroke. In this figure the spaces between the double dotted lines (*a g, i b*) represent the down strokes, the single dotted line (*h, i*) representing the up stroke. The kite-like surfaces and angles made by the wing with the horizon (*a, b*) during the down strokes are indicated at *c d e f g, j k l m*,—those made during the up strokes being indicated at *g h i*. As the down and up strokes run into each other, and the convex surface of the wing is always directed upwards and the concave surface downwards, it follows that the upper surface of the wing evades in a great measure the upper air, while the under surface seizes the nether air. It is easy to understand from this figure how the wing always flying forwards furnishes a persistent buoyancy. (Pettigrew, 1870.)

There are good reasons why the wings should always be in advance of the body. A bird when flying is a body in motion; but a body in motion tends to fall not vertically downwards, but *downwards and forwards.* The wings consequently must be in advance of the body of the bird if they are to prevent the bird from falling *downwards and forwards.* If the wings were to strike backwards in aërial flight, the bird would turn a forward somersault.

That the wings invariably strike downwards and forwards in aërial flight is proved alike by observation and experiment. If any one watches a bird rising from the ground or the water, he cannot fail to perceive that the head and body are slightly tilted upwards, and that the wings are made to descend with great vigor in a downward and forward direction. The dead natural wing and a properly constructed artificial wing act in precisely the same way. If the wing of a gannet, just shot, be removed and made to flap in what the operator believes to be a strictly vertical downward direction, the tip of the wing, in spite of him, will dart forwards between two and three feet—the amount of forward movement being regulated by the rapidity of the down stroke. This is a very striking experiment. The same thing happens with a properly constructed artificial wing. The down stroke with the artificial as with the natural wing is invariably converted into an oblique, downward, and forward stroke. No one ever saw a bird in the air flapping its wings towards its tail. The old idea was that the wings *pushed* the body of the bird in an upward and forward direction; in reality the wings do not push, but *pull*, and in order to pull they must always be in advance of the body to be flown. If the wings did not themselves fly *forward*, they could not possibly cause the body of the bird to fly forward. It is the wings which fly the bird, and not the converse.

It only remains to be stated that the wing acts as a true kite, during both down and up strokes, its under concave or biting surface, in virtue of the forward travel communicated to it by the body of the flying creature, being closely applied to the air, during both its ascent and its descent. This explains how the wing furnishes a persistent buoyancy alike when it rises and when it falls (fig. 30).

The natural kite formed by the wing differs from the artificial kite only in this, that the former is capable of being moved in all its parts, and is more or less flexible and elastic, whereas the latter is comparatively rigid. The flexibility and elasticity of the kite formed by the natural wing are rendered necessary by the fact that the wing, as already stated, is practically hinged at its root and along its anterior margin—an arrangement which necessitates its several parts travelling at different degrees of speed, in proportion as they are removed from the axes of rotation. Thus the tip travels at a higher speed than the root, and the posterior margin than the anterior margin. This begets a *twisting diagonal movement* of the wing on its long axis, which, but for the elasticity referred to, would break the wing into fragments. The elasticity contributes also to the continuous play of the wing, and insures that no two parts of it shall reverse at exactly the same instant. If the wing was inelastic, every part of it would reverse at precisely the same moment, and its vibration would be characterized by pauses or dead points at the end of the down and up strokes which would be fatal to it as a flying organ. The elastic properties of the wing are absolutely essential, when the mechanism and movements of the pinion are taken into account. A rigid wing can never be an effective flying instrument.

The kite-like surfaces referred to in natural flight are those upon which the constructors of flying machines very properly ground their hopes of ultimate success. These surfaces may be conferred on artificial wings, aëroplanes, aërial screws, or similar structures; and these structures, if we may judge from what we find in nature, *should be of moderate size and elastic.* The power of the flying organs will be increased if they are driven at a comparatively high speed, and particularly if they are made to reverse and reciprocate, as in this case they will practically create the currents upon which they are destined to rise and advance. The angles made by the kite-like surfaces with the horizon should vary according to circumstances. They should be small when the speed is high, and *vice versâ*. This, as stated, is true of natural wings. It should also be true of artificial wings and their analogues. There is no escaping from natural laws. A knowledge of natural laws alone will enable us to construct (it is to be hoped in the immediate future) the much-desired flying machine.

Having explained as far as space would permit how water differs from air, how the sailing ship differs from the balloon, and how the balloon differs from the flying creature and flying machine constructed on the living type, and having further explained the peculiarities of wings and wing movements as witnessed in natural flight, we are now in a position to enter upon a consideration of artificial wings and wing movements, and of artificial flight and flying machines.

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[1] *On the Flight of Birds, of Bats, and of Insects, in reference to the subject of Aërial Locomotion*, by M. de Lucy, Paris.

We begin with artificial wings. The first properly authenticated account of an artificial wing was given by Borelli in 1670. This author, distinguished alike as a physiologist, mathematician, and mechanician, describes and figures a bird with artificial wings, each of which consists of *a rigid rod in front and flexible feathers behind.* The wings are represented as striking *vertically downwards,* as the annexed duplicate of Borelli's figure shows (fig. 31).

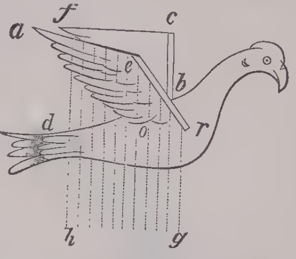

Fig. 31.—Borelli's bird with artificial wings. *r e*, anterior margin of the right wing, consisting of a rigid rod; *o a*, posterior margin of the right wing, consisting of flexible feathers; *b c*, anterior, and *f*, posterior margins of the left wing same as the right; *d*, tail of the bird; *r g*, *d h*, vertical direction of the down stroke of the wing. (Borelli, 1670.)

Borelli was of opinion that flight resulted from the application of an inclined plane, which beats the air, and which has a wedge action. He, in fact, endeavors to prove that a bird wedges itself forward upon the air by the perpendicular vibration of its wings, the wings during their action forming a wedge, the base of which (*c b e*) is directed towards the head of the bird, the apex (*a f*) being directed towards the tail (*d*). In the 196th proposition of his work (*De motu Animalium,* Leyden, 1685) he states that—

> "If the expanded wings of a bird suspended in the air shall strike the undisturbed air beneath it with a motion *perpendicular to the horizon,* the bird will fly with *a transverse motion* in a plane parallel with the horizon." "If," he adds, "the wings of the bird be expanded, and the under surfaces of the wings be struck by the air *ascending perpendicularly to the horizon* with such a force as shall prevent the bird gliding downwards (*i. e.,* with a tendency to glide downwards) from falling, it will be urged in a horizontal direction."
>
> The same argument is re-stated in different words as under:—"If the air under the wings be struck by the flexible portions of the wings (*flabella,* literally fly flaps or small fans) with a motion perpendicular to the horizon, the sails (*vela*) and flexible portions of the wings (*flabella*) will yield in an upward direction and form a wedge, the point of which is directed towards the tail. Whether, therefore, the air strikes the wings from below, or the wings strike the air from above, the result is the same,—the posterior or flexible margins of the wings *yield in an upward direction,* and in so doing urge the bird in *a horizontal direction.*"

There are three points in Borelli's argument to which it is necessary to draw attention:—(1) the direction of the down stroke: it is stated to be *vertically downwards;* (2) the construction of the anterior margin of the wing: it is stated to consist of *a rigid rod;* (3) the function delegated to the posterior margin of the wing: it is said *to yield in an upward direction* during the down stroke.

With regard to the first point. It is incorrect to say the wing strikes *vertically downwards,* for, as already explained, the body of a flying bird is a body in motion; but as a body in motion tends to fall downwards and forwards, the wing must strike *downwards* and *forwards* in order effectually to prevent its fall. Moreover, in point of fact, all natural wings and all artificial wings constructed on the natural type invariably strike *downwards and forwards.*

With regard to the second point, viz., the supposed *rigidity* of the anterior margin of the wing, it is only necessary to examine the anterior margins of natural wings to be convinced that they are in every case *flexible and elastic.* Similar remarks apply to properly constructed artificial wings. If the anterior margins of natural and artificial wings were rigid, it would be impossible to make them vibrate smoothly and continuously. This is a matter of experiment. If a rigid rod, or a wing with a rigid anterior margin, be made to vibrate, the vibration is characterized by an unequal jerky motion, which contrasts strangely with the smooth, steady, fanning movement peculiar to natural wings.

As to the third point, viz., *the upward bending of the posterior margin of the wing during the down stroke,* it is necessary to remark that the statement is true if it means a slight upward bending, but that it is untrue if it means an extensive upward bending.

Borelli does not state the amount of upward bending, but one of his followers, Professor E. J. Marey, maintains that during the down stroke the wing yields until its under surface makes *a backward angle with the horizon of 45°.* Marey further states that during the up stroke the wing yields to a corresponding extent in an opposite direction—the posterior margin of the wing, according to him, passing through an angle of 90°, plus or minus, according to circumstances, every time the wing rises and falls.

That the posterior margin of the wing yields to a slight extent during both the down and up strokes will readily be admitted alike because of the very delicate and highly elastic properties of the posterior margins of wings, and because of the comparatively great force employed in their propulsion; but that they do not yield to the extent stated by Professor Marey is a matter of absolute certainty. This admits of direct proof. If any one watches the horizontal or upward flight of a large bird he will observe that the posterior or flexible margin of the wing never rises during the down stroke to a perceptible extent, so that the under surface of the wing never looks backwards. On the contrary, he will perceive that the under surface of the wing (during the down stroke) invariably looks forwards and forms a true kite with the horizon, the angles made by the kite varying at every part of the down stroke, as shown more particularly at *c d e f g, i j k l m* of fig. 30, p. 277.

The authors who have adopted Borelli's plan of artificial wing, and who have endorsed his mechanical views of the wing's action most fully, are Chabrier, Straus-Durkheim, Girard, and Marey. Borelli's artificial wing, it will be remembered, consists of a *rigid rod* in front and a *flexible sail* behind. It is also made to strike *vertically downwards.* According to Chabrier, the wing has only one period of activity. He believes that if the wing be suddenly lowered by the depressor muscles, it is elevated solely by the reaction of the air. There is one unanswerable objection to this theory: the bats and birds, and some if not all the insects, have distinct elevator muscles, and can elevate their wings at pleasure when not flying and when consequently the reaction of the air is not elicited. Straus-Durkheim agrees with Borelli both as to the natural and the artificial wing. Durkheim is of opinion that the insect abstracts from the air by means of the *inclined plane* a component force (*composant*) which it employs to *support* and *direct* itself. In his theology of nature he describes a schematic wing as consisting of a *rigid ribbing* in front, and a *flexible sail* behind. A membrane so constructed will, according to him, be fit for flight. It will suffice if such a sail elevates and lowers itself successively. It will of its own accord dispose itself as an inclined plane, and *receiving obliquely the reaction of the air,* it transfers into *tractile force* a part of the *vertical impulsion it has received.* These two parts of the wing, moreover, are equally indispensable to each other.

Marey repeats Borelli and Durkheim with very trifling modifications, so late as 1869.[1] He describes two artificial wings, the one composed of a *rigid rod* and *sail*—the rod representing *the stiff anterior margin* of the wing; the sail, which is made of paper bordered with card board, *the flexible posterior margin.* The other wing consists of a *rigid nervure* in front and behind of thin parchment which supports fine rods of steel. He states that, if the wing only elevates and depresses itself, "the *resistance of the air* is sufficient to produce all the other movements. In effect (according to Marey) the wing of an insect has not the power of equal resistance in every part. On the anterior margin the extended nervures make it *rigid,* while behind it is fine and *flexible.* During the vigorous depression of the wing, the nervure has the power of *remaining rigid,* whereas the flexible portion, *being pushed in an upward direction* on account of the resistance it experiences from the air, assumes an oblique position which causes *the upper surface of the wing to look forwards.*" The reverse of this in Marey's opinion, takes place during the elevation of the wing—the resistance of the air from above causing *the upper surface of the wing to look backwards*. . . . "At first," he says, "the plane of the wing is parallel with the body of the animal. It lowers itself—*the front part of the wing strongly resists*, the sail which follows it being flexible *yields*. Carried by the ribbing (the anterior margin of the wing) which lowers itself, *the sail or posterior margin of the wing being raised meanwhile by the air*, which sets it straight again, the sail will take an intermediate position and *incline itself about 45° plus or minus* according to circumstances. . . . The wing continues its movements of depression inclined to the horizon; but the impulse of the air, which continues its effect, and naturally acts upon the surface which it strikes, has the power of resolving itself into two forces, *a vertical* and a *horizontal* force; the first suffices *to raise* the animal, the second *to move it along*."[1] Professor Marey, it will be observed, reproduces Borelli's artificial wing, and even his text, at a distance of nearly two centuries.

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[1] *Revue des Cours Scientifiques de la France et de l'Étranger,* 1869, par M. le Docteur Marey, professeur au Collége de France.

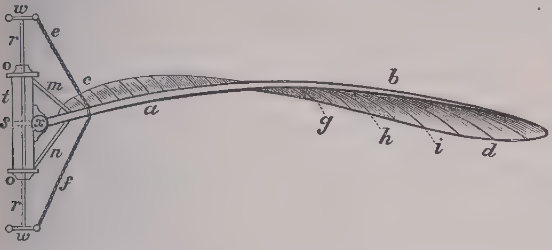

FIG. 32.—Elastic spiral wing, which twists and untwists during its action, to form *a mobile helix or screw*. This wing is made to vibrate by a direct piston action, and by a slight adjustment can be propelled vertically, horizontally, or at any degree of obliquity.

a b, Anterior margin of wing, to which the neuræ or ribs are affixed. *c d*, Posterior margin of wing crossing anterior one. *x*, Ball-and-socket joint at root of wing, the wing being attached to the side of the cylinder by the socket. *t*, Cylinder. *r r*, Piston, with cross heads (*w*, *w*) and piston head (*s*). *o o*, Stuffing boxes. *e*, *f*, Driving chains. *m*, Superior elastic band, which assists in elevating the wing. *n*, Inferior elastic band, which antagonizes *m*. The alternate stretching of the superior and inferior elastic bands contributes to the continuous play of the wing, by preventing dead points at the end of the down and up strokes. The wing is free to move in a vertical and horizontal direction and at any degree of obliquity. (Pettigrew, 1870.)

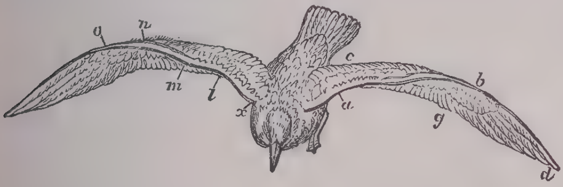

FIG. 33 shows the spiral elastic wings of the Gull. Each wing forms a mobile helix or screw. *a b*, Anterior margin of left wing; *c d*, posterior margin of ditto; *d g*, primary or rowing feathers of left wing; *g a*, secondary feathers ditto; *x*, root of right wing with ball-and-socket joint; *l*, elbow joint; *m*, wrist joint; *n*, *o*, hand and finger joints. (Pettigrew, 1870.)

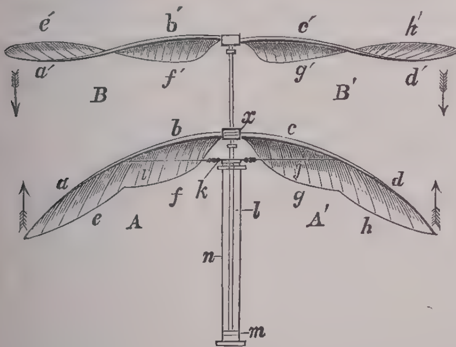

FIG. 34.—Double elastic wing driven by direct piston action. During the up stroke of the piston the wing is very decidedly convex on its upper surface (*a b c d*, A A′); its under surface (*e f g h*, A A′) being deeply concave and inclined obliquely upwards and forwards. It thus evades, to a considerable extent, the air during the up stroke. During the down stroke of the piston the wing is flattened out in every direction, and its extremities twisted in such a manner as to form two screws, as seen at *a′ b′ c′ d′*, *e′ f′ g′ h′*, B, B′. The active area of the wing is by this arrangement considerably diminished during the up stroke, and considerably augmented during the down stroke; the wing seizing the air with greater avidity during the down than during the up stroke. *i*, *j*, *k*, elastic band to regulate the expansion of the wing; *l*, piston; *m*, piston head; *n*, cylinder. (Pettigrew, 1870.)

The artificial wing recommended by Professor Pettigrew is a more exact imitation of nature than either of the foregoing. It is of a more or less triangular form, thick at the root and anterior margin, and thin at the tip and posterior margin. *No part of it is rigid.* It is on the contrary highly elastic and flexible throughout. It is furnished with springs at its root to contribute to its continued play, and is applied to the air by a direct piston action in such a way that it descends in a downward and forward direction during the down stroke, and ascends in an upward and forward direction during the up stroke. It elevates and propels both when it rises and falls. *It, moreover, twists and untwists during its action and describes figure-of-8 and waved tracks in space, precisely as the natural wing does.* The twisting is most marked at the tip and posterior margin, particularly that half of the posterior margin next the tip. The wing when in action may be divided into two portions by a line running diagonally between the tip of the wing anteriorly and the root of the wing posteriorly. The tip and posterior parts of the wing are more active than the root and anterior parts, from the fact that the tip and posterior parts (the wing is an eccentric) always travel through greater spaces, in a given time, than the root and anterior parts.

The wing is so constructed that the posterior margin yields freely in a downward direction during the up stroke, while it yields comparatively little in an upward direction during the down stroke; and this is a distinguishing feature, as the wing is thus made to fold and elude the air more or less completely during the up stroke, whereas it is made to expand and seize the air with avidity during the down stroke. The oblique line referred to as running diagonally across the wing virtually divides the wing into an active and a passive part, the former elevating and propelling, the latter sustaining.

It is not possible to determine with exactitude the precise function discharged by each part of the wing, but experiment tends to show that the tip of the wing *elevates*, the posterior margin *propels*, and the root *sustains*.

The wing—and this is important—is driven by a direct piston action with an irregular hammer-like movement, the pinion having communicated to it a smart click at the beginning of every down stroke—the up stroke being more uniform. The arrangement is that shown in fig. 32. If the artificial wing here represented (fig. 32) be compared with the natural wing as depicted at fig. 33, it will be seen that there is nothing in the one which is not virtually reproduced in the other. In addition to the foregoing, Professor Pettigrew recommends a double elastic wing to be applied to the air like a steam-hammer, by being fixed to the head of the piston. This wing, like the single wing described, twists and untwists as it rises and falls, and possesses all the characteristics of the natural wing (fig. 34).

He also recommends an *elastic aërial screw* consisting of two blades, which taper and become thinner towards the tips and posterior margins. When the screw is made to rotate, the blades, because of their elasticity, assume a great variety of angles, the angles being least where the speed of the blades is greatest and *vice versâ*. The pitch of the blades is thus regulated by the speed attained (fig. 35).

The peculiarity of Professor Pettigrew's wings and screws consists in their *elasticity*, their *twisting action*, and their *great comparative length and narrowness*. They offer little resistance to the air when they are at rest, and when in motion the speed with which they are driven is such as to ensure that the comparatively large spaces through which they travel shall practically be converted into solid bases of support.

Since Professor Pettigrew enunciated his views (1867) as to the screw configuration and elastic properties of natural wings, and more especially since his introduction of *spiral, elastic artificial wings, and elastic screws*, a great revolution has taken place in the construction of flying models. Elastic aëro-planes are now advocated by Mr. Brown,[1] elastic aerial screws by Mr. Armour,[2] and elastic aëro-planes, wings, and screws by M. Pénaud.[3]

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[1] Professor E. J. Marey, *op. cit.*, 1869.

M. Pénaud's experiments are alike interesting and instructive. He constructed models to fly by three different methods:—(*a*) by means of screws acting vertically upwards; (*b*) by aëro-planes propelled horizontally by screws; and (*c*) by wings which flapped in an upward and downward direction. An account of his helicoptère or screw model appears in the *Aëronaut* for January, 1872, but before giving a description of it, it may be well to state very briefly what is known regarding the history of the screw as applied to the air.

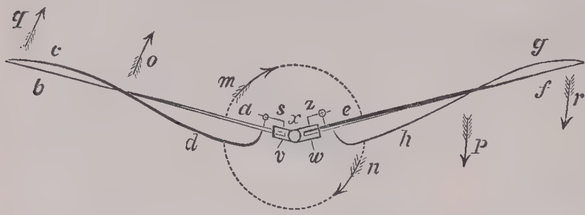

FIG. 35.—Elastic aërial screw with twisted blades resembling wings (*a b c d, e f g h*); *x*, end of driving shaft; *v, w*, sockets in which the roots of the blades of the screw rotate, the degree of rotation being limited by steel springs (*z, s*); *a b, e f*, tapering elastic rods forming anterior or thick margins of blades of screw; *d c, h g*, posterior or thin elastic margins of blades of screw. The arrows *m, n, o, p, q, r* indicate the direction of travel. (Pettigrew, 1870.)

The first suggestion on this subject was given by Paucton in 1768. This author, in his treatise on the *Théorie de la Vis d'Archiméde*, describes a machine provided with two screws which he calls a "ptérophores." In 1796 Sir George Cayley gave a practical illustration of the efficacy of the screw as applied to the air by constructing a small machine, consisting of two screws made of quill feathers, a representation of which we annex (fig. 36). Sir George writes as under:—

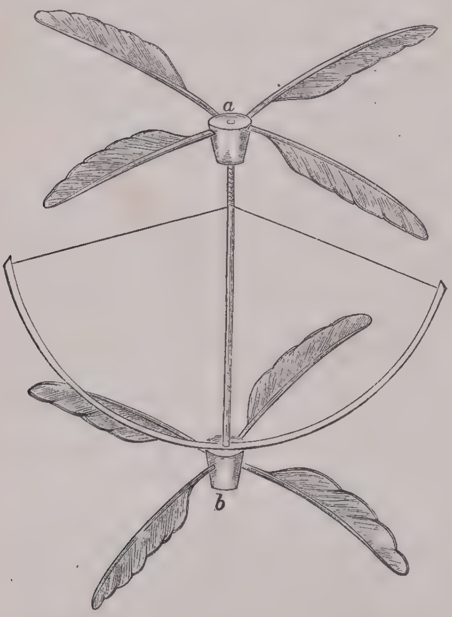

FIG. 36.—Cayley's Flying Model (1796).

> "As it may be an amusement to some of your readers to see a machine rise in the air by mechanical means, I will conclude my present communication by describing an instrument of this kind, which any one can construct at the expense of ten minutes' labor.
>
> "*a* and *b*, fig. 36, are two corks, into each of which are inserted four wing feathers from any bird, so as to be slightly inclined like the sails of a windmill, but in opposite directions in each set. A round shaft is fixed in the cork *a*, which ends in a sharp point. At the upper part of the cork *b* is fixed a whalebone bow, having a small pivot hole in its centre to receive the point of the shaft. The bow is then to be strung equally on each side to the upper portion of the shaft, and the little machine is completed. Wind up the string by turning the flyers different ways, so that the spring of the bow may unwind them with their anterior edges ascending; then place the cork with the bow attached to it upon a table, and with a finger on the upper cork press strong enough to prevent the string from unwinding, and, taking it away suddenly, the instrument will rise to the ceiling."

Cayley's screws were peculiar, inasmuch as they were superimposed and rotated in opposite directions. He estimated that if the area of the screws was increased to 200 square feet, and moved by a man, they would elevate him. His interesting experiment is described at length, and the apparatus figured, in *Nicolson's Journal*, 1809, p. 172.

Other experimenters followed Cayley at moderate intervals:—Deghen in 1816, Ottoris Sarti in 1823, and Dubochet in 1834. These inventors all constructed flying models on the vertical screw principle. In 1842 Mr. Philips succeeded in elevating a steam model by the aid of revolving fans, which flew across two fields after having attained a great altitude; and in 1859 Mr. Bright took out a patent for a machine to be sustained by vertical screws, the model of which is to be seen at the patent museum, Kensington, London. In 1863 the subject of aviation by vertical screws received a fresh impulse from the experiments of MM. Ponton d'Amécourt, De la Landelle, and Nadar, who exhibited models driven by clock-work springs, which ascended with graduated weights a distance of from 10 to 12 feet. These models were so fragile that they usually broke in coming in contact with the ground in their descent. Their flight, moreover, was unsatisfactory, from the fact that it only lasted a few seconds.

Stimulated by the success of his spring models, M. Ponton d'Amécourt had a small steam model constructed. This model, which was shown at the exhibition of the Aëronautical Society of Great Britain at the Crystal Palace in 1868, consisted of two superposed screws propelled by an engine, the steam for which was generated (for lightness) in an aluminium boiler. This steam model proved a failure, inasmuch as it only lifted a third of its own weight.

Fig. 37 embodies M. de la Landelle's ideas.

All the models referred to (Cayley's excepted[4]) were provided with *rigid* screws, which, for many reasons, we are disposed to regard as an error. In 1872 M. Pénaud discarded the rigid screws in favor of elastic ones, as Professor Pettigrew had done some years before.

M. Pénaud also substituted india-rubber under torsion for the whalebone and clock springs of the smaller models, and the steam of the larger ones. His helicoptère or screw model is remarkable for its lightness, simplicity, and power The accompanying sketch will serve to illustrate its construction (fig. 38). It consists of two superposed elastic screws (*a a, b b*), the upper of which (*a a*) is fixed in a vertical frame (*c*), which is pivoted in the central part (*d*) of the under screw. From the centre of the under screw an axle provided with a hook (*e*), which performs the part of a crank, projects in an upward direction. Between the hook or crank (*e*) and the centre of the upper screw (*a a*), the india-rubber in a state of torsion (*f*) extends. By fixing the lower screw and turning the upper one a sufficient number of times the requisite degree of torsion and power is obtained. The apparatus when liberated flies into the air sometimes to a height of 50 feet, and gyrates in beautiful large circles for a period varying from 15 to 30 seconds.

M. Pénaud next directed his attention to the construction of a model, to be propelled by a screw and sustained by an elastic aëro-plane extending horizontally. Sir George Cayley, it should be stated, proposed such a machine in 1810, and Mr. Henson (as will be shown subsequently) constructed and patented a similar machine in 1842.

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[1] "The Aëro-bi-plane, or First Steps to Flight," *Ninth Annual Report of the Aëronautical Society of Great Britain*, 1874.

[2] "Resistance to Falling Planes on a Path of Translation," *Ninth Annual Report of the Aëronautical Society of Great Britain*, 1874.

[3] The *Aëronaut* for January, 1872, and February, 1875.

[4] Cayley's screws, as explained, were made of feathers, and consequently elastic. As, however, no allusion is made in his writings to the superior advantages possessed by elastic over rigid screws, it is to be presumed that feathers were employed simply for convenience and lightness. Professor Pettigrew, there is reason to believe, was the first to advocate the employment of elastic screws for aërial purposes.

Several other inventors succeeded in making models fly by the aid of aëro-planes and screws, as *e.g.*, Mr. Stringfellow in 1847,[1] M. du Temple in 1857, and M. Jullien in 1858. As *rigid* aëro-planes and screws were employed in the construction of these models they flew in a hap-hazard sort of a way, it being found exceedingly difficult to confer on them the necessary degree of stability fore and aft and laterally. M. Pénaud succeeded in overcoming the difficulty in question by the invention of what he designates his automatic rudder. This consists of a small *elastic* aëro-plane placed aft or behind the principal aëro-plane, which is also *elastic*. The two elastic aëro-planes extend horizontally and make a slight upward angle with the horizon, the angle made by the smaller aëro-plane (the rudder) being slightly in excess of that made by the larger. The motive power is india-rubber in the condition of torsion; the propeller, a screw. The reader will understand the arrangement by reference to the accompanying drawing (fig. 39).

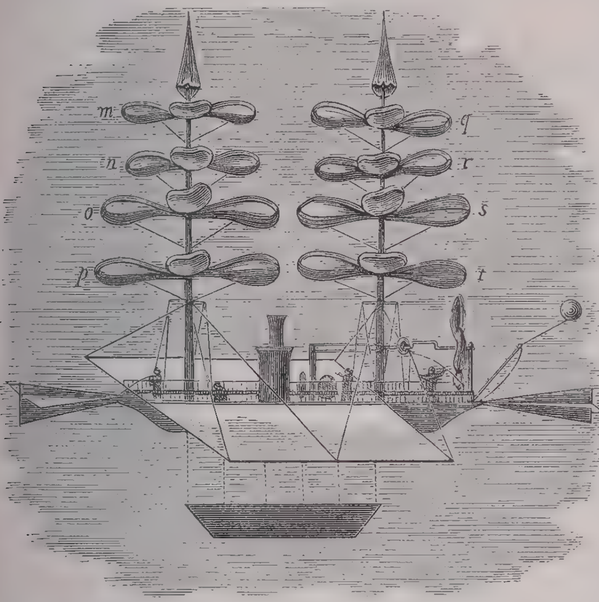

Fig. 37.—*m, n, o, p*; *q, r, s, t*, screws arranged on vertical axes to act vertically upwards. The vertical axes are surmounted by two parachutes, and the body of the machine is furnished with an engine, propeller, rudders, and an extensive aëro-plane. (M. de la Landelle, 1863.)

Models on the aëro-plane screw type may be propelled by two screws, one fore and one aft, rotating in opposite directions; and in the event of only one screw being employed it may be placed in front of or behind the aëro-plane.

When the model is wound up and let go it descends about two feet, after which, having acquired initial velocity, it rises and flies in a forward direction at a height of from 8 to 10 feet from the ground for a distance of from 120 to 130 feet. It flies this distance in from 10 to 11 seconds, its mean speed being something like 12 feet per second. From experiments made with this model, M. Pénaud calculates that one horse power would elevate and support 85 ℔.

Mr. Brown has also written (1874) in support of elastic aëro-bi-planes. His experiments prove that two elastic aëro-planes united by a central shaft or shafts, and separated by a wide interval, always produce increased stability. The production of flight by the vertical flapping of wings is in some respects the most difficult, but this also has been attempted and achieved. M. Pénaud and M. de Villeneuve have each constructed winged models. Professor Marey was not so fortunate. He endeavored to construct an artificial insect on the plan advocated by Borelli, Straus-Durkheim, and Chabrier, but signally failed, his insect never having been able to lift more than a third of its own weight.

MM. de Villeneuve and Pénaud constructed their winged models on different types, the former selecting the bat, the latter the bird. M. Villeneuve made the wings of his artificial bat conical in shape and comparatively rigid. He controlled the movements of the wings, and made them strike downwards and *forwards* in imitation of natural wings, as described by Professor Pettigrew. His model possessed great power of rising. It elevated itself from the ground with ease, and flew in a horizontal direction for a distance of 24 feet, and at a velocity of 20 miles an hour. M. Pénaud's model differed from M. de Villeneuve's in being provided with elastic wings, the posterior margins of which in addition to being elastic were free to move round the anterior margins as round axes (see p. 274, fig. 24). India-rubber springs were made to extend between the inner posterior parts of the wings and the frame, corresponding to the backbone of the bird.

A vertical movement having been communicated by means of india-rubber in a state of torsion to the roots of the wings, the wings themselves, in virtue of their elasticity, and because of the resistance experienced from the air, twisted and untwisted and formed reciprocating screws, precisely analogous to those originally described and figured by Professor Pettigrew in 1867. M. Pénaud's arrangement is shown in fig. 40.

If the left wing of M. Pénaud's model (*a b*, *c d* of fig. 40) be compared with the wing of the bat as drawn by Professor Pettigrew (fig. 18, page 273), or with Professor Pettigrew's artificial wing (page 279, fig. 32), the identity of principle and application is at once apparent.

The twisting kite-like action of the wings, to which allusion has so frequently been made, and to which, as has been shown, Professor Pettigrew first strongly directed attention in 1867, justifies our introductory remarks as to the very intimate relation which subsists between natural and artificial flight. As already stated, it is not possible to understand artificial flight in the absence of a knowledge of natural flight.

In M. Pénaud's artificial bird the equilibrium is secured by the addition of a tail. The model cannot raise itself from the ground, but on being liberated from the hand it descends 2 feet or so, when, having acquired initial velocity, it flies horizontally for a distance of 50 or more feet, and rises as it flies from 7 to 9 feet. The following are the measurements of the model in question:—length of wing from tip to tip, 32 inches; weight of wing, tail, frame, india-rubber, etc., 73 grammes (about 2½ ounces).

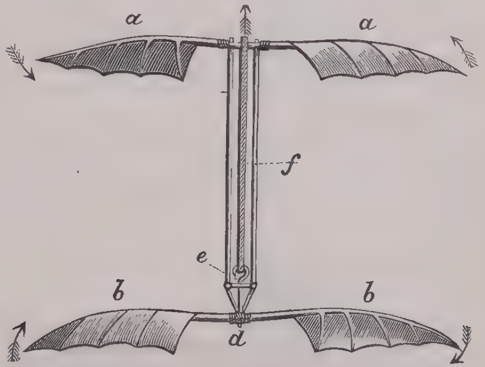

Fig. 38.—Helicoptère or Screw-Model, by M. Pénaud. (1872.)

We have referred to Mr. Henson's flying machine, which was designed in 1843. As it was the earliest attempt at aërostation on a great scale it deserves a more than passing notice. Mr. Henson was one of the first to combine aërial screws with extensive supporting structures occupying a nearly horizontal position. The accompanying illustration explains the combination (fig. 41).

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[1] Mr. Stringfellow constructed a second model, which was exhibited at the exhibition of the Aëronautical Society (Crystal Palace), in 1868. It is described and figured further on.

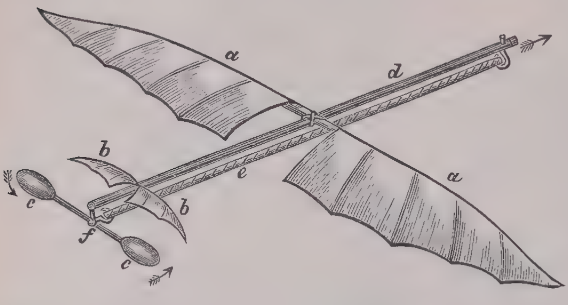

Fig. 39.—Aëro-plane model with automatic rudder. *a a*, elastic aëro-plane; *b*, *b*, automatic rudder; *c c*, aërial screw centred at *f*; *d*, frame supporting aëro-plane, rudder, and screw; *e*, india-rubber, in a state of torsion, attached to hook or crank at *f*. By holding the aëro-plane (*a a*) and turning the screw (*c c*) the necessary power is obtained by torsion. (M. Pénaud, 1872.)

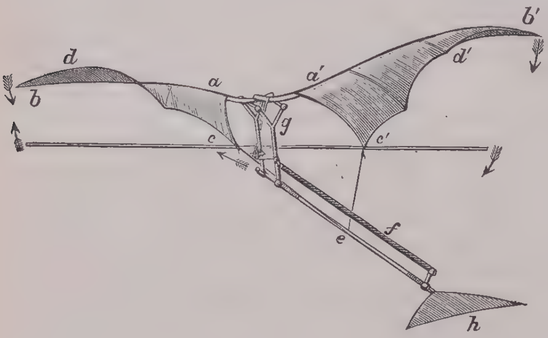

Fig. 40.—Artificial flying bird. *a b c d*, *a' b' c' d'*, elastic wings, which twist and untwist when made to vibrate; *a b*, *a' b'*, anterior margins of wings; *c d*, *c' d'*, posterior margins of wings; *c*, *c'*, inner portions of wings attached to central shaft of model by elastic bands at *e*; *f*, india-rubber in a state of torsion, which provides motive power, by causing the crank situated between the vertical wing supports (*g*) to rotate; as the crank revolves the wings are made to vibrate by means of two rods which extend between the crank and the roots of the wings; *h*, tail of artificial bird. (M. Pénaud, 1872.)

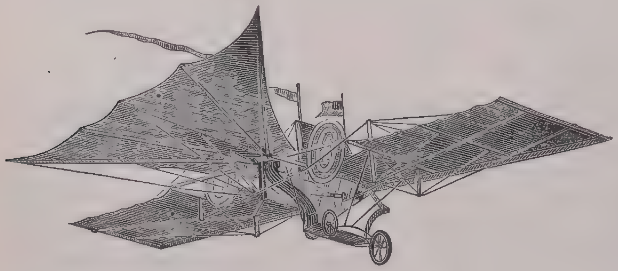

Fig. 41.—Henson's Aërostat (1843).

"The chief feature of the invention was the very great expanse of its sustaining planes, which were larger in proportion to the weight it had to carry than those of many birds. The machine advanced *with its front edge a little raised*, the effect of which was to present its under surface to the air over which it passed, the resistance of which, acting upon it like a strong wind on the sails of a windmill, prevented the descent of the machine and its burden. The sustaining of the whole, therefore, depended upon the speed at which it travelled through the air, and *the angle at which its under surface impinged on the air in its front*. . . . The machine, fully prepared for flight, was started from the top of an inclined plane, in descending which it attained a velocity necessary to sustain it in its further progress. That velocity would be gradually destroyed by the resistance of the air to the forward flight; it was therefore, the office of the steam-engine and the vanes it actuated simply to repair the loss of velocity; it was made, therefore, only of the power and weight necessary for that small effect." The editor of Newton's *Journal of Arts and Sciences* speaks of it thus:—"The apparatus consists of a car containing the goods, passengers, engines, fuel, etc., to which a rectangular frame, made of wood or bamboo cane, and covered with canvas or oiled silk, is attached. This frame extends on either side of the car in a similar manner to the outstretched wings of a bird; but with this difference, that *the frame is immovable*. Behind the wings are two vertical fan wheels, furnished with oblique vanes, which are intended to propel the apparatus through the air. The rainbow-like circular wheels are the propellers, answering to the wheels of a steam-boat, and acting upon the air after the manner of a windmill. These wheels receive motions from bands and pulleys from a steam or other engine contained in the car. To an axis at the stern of the car a triangular frame is attached, resembling the tail of a bird, which is also covered with canvas or oiled silk. This may be expanded or contracted at pleasure, and is moved up and down for the purpose of causing the machine to ascend or descend. Beneath the tail is a rudder for directing the course of the machine to the right or to the left; and to facilitate the steering a sail is stretched between two masts which rise from the car. The amount of canvas or oiled silk necessary for buoying up the machine is stated to be equal to one square foot for each half pound of weight."

The defect of Mr. Henson's machine consists mainly in its rigidity, and in the vast amount of sustaining surface displayed by it, this approximating it in some measure to the balloon.

Mr. Wenham, thinking to improve upon Mr. Henson, invented in 1867 what he designated his aëro-planes.[1] The aëro-planes are thin, light, long narrow structures, arranged above each other in tiers like so many shelves. They are tied together at a slight upward angle, and combine strength and lightness. The idea is to obtain great sustaining area in comparatively small space. It was hoped that when the aëro-planes were wedged forward in the air by vertical screws, or by the body to be flown, each aëro-plane would rest or float upon a stratum of undisturbed air, and that practically the aëro-planes would give the same support as if spread out horizontally. The aëro-planes may be said to form a compound kite, and have only been partially successful. They are rigid, and present a large extent of dead surface, so that the same objections made to Mr. Henson's arrangement apply to them. The great sustaining surface they present forms at once their strength and weakness. They sustain and lift, but are very difficult to wedge forward, and if a breeze be blowing they become unmanageable, in the sense that a balloon is unmanageable. The accompanying figures illustrate Mr. Wenham's views (figs. 42 and 43).

Mr. Stringfellow, who was originally associated with Mr. Henson, and constructed a successful flying model in 1847, built a second model in 1868, in which Mr. Wenham's aëro-planes were combined with aërial screws. This model was on view at the Exhibition of the Aëronautical Society of Great Britain, held at the Crystal Palace, London, in 1868. It was remarkably compact, elegant, and light, and obtained the £100 prize of the exhibition for its engine, which was the lightest and most powerful ever constructed. The annexed woodcut (fig. 44), taken from a photograph of Mr. Stringfellow's model, gives a very good idea of the arrangement,—*a*, *b*, *c* representing the superimposed planes, *d* the tail, *e*, *f* the vertical screw propellers. The superimposed planes (*a*, *b*, *c*) in this machine contained a sustaining area of 28 square feet, in addition to the tail (*d*). Its engine represented a third of a horse power, and the weight of the whole (engine, boiler, water, fuel, superimposed planes, and propellers) was under 12 lb. Its sustaining area, if that of the tail (*d*) be included, was something like 36 square feet, *i.e.*, 3 square feet for every pound. The model was forced by its propellers along a wire at a great speed, but so far as an observer could determine, failed to lift itself, notwithstanding its extreme lightness and the comparatively very great power employed. Mr. Stringfellow stated that his machine occasionally left the wire and was sustained by its aëro-planes alone. The horizontal speed attained was certainly very great; but as the machine was exhibited under cover in the Crystal Palace buildings, and ran along a wire, it is doubtful how it would have deported itself in the open air. Everything about it was *rigid*, the aëro-planes, screws, etc.; and as the dead surfaces displayed were comparatively very large, the chances are that it would not have been able to hold its own against air currents. That the principle of its construction was faulty is proved beyond doubt by the fact that it weighed under 12 ℔, while its engine exerted a third of a horse power. No flying creature, as is well known, weighing 12 ℔ possesses a tithe of the power indicated. This fact is significant as showing that flight is not a mere question of levity and power. As has been more than once stated in the present article, the mystery of flight can only be cleared up by an intelligent study of the structure and mode of application of the flying organs of animals. It is to natural flight and the principles which underlie it that the aëronaut must look for a solution of the intensely interesting but vastly complicated problem of aërial navigation.

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[1] "On Aërial Locomotion," *Aëronautical Society's Report* for 1867.

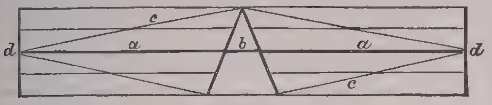

Fig. 42.

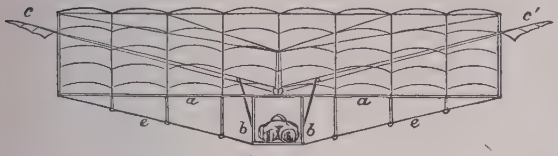

Fig. 43.

Fig. 42 represents a system of aëro-planes designed to carry a man. *a, a*, thin planks, tapering at each end, and attached to a triangle: *b*, similar plank for supporting the aëronaut; *c, c*, thin bands of iron which truss planks *a, a*; *d, d*, vertical rods. Between these are stretched five bands of holland 15 inches broad and 16 feet long, the total length of the web being 80 feet. This apparatus, when caught by a gust of wind, actually lifted the aëronaut. (Wenham, 1867.)

Fig. 43.—A system of aëro-planes similar to that represented at fig. 42. *a a*, main spar 16 feet long; *b b*, panels, with base board for aëronaut attached to main spar; *e e*, thin tie-band of steel with struts starting from main spar. This forms a strong light framework for the aëro-planes, consisting of six webs of thin holland 15 inches broad. The aëro-planes are kept in parallel plane by vertical divisions of holland 2 feet wide. *c, c*, wing propellers driven by the feet. (Wenham, 1867.)

The idea embodied by Henson, Wenham, and Stringfellow is plainly that of a boy's kite sailing upon the wind. The kite, however, is a more perfect flying apparatus than that furnished by these gentlemen, inasmuch as the inclined plane formed by its body strikes the air at various angles—the angles varying according to the length of string, strength of breeze, length and weight of tail, etc. Henson's, Wenham's, and Stringfellow's methods, although carefully tried, have hitherto failed. The objections are numerous. In the first place, the supporting planes (aëro-planes or other forms) are not flexible and elastic as wings are, but *rigid;* 2d, they strike the air *at a given angle*, where, again, there is a departure from nature; 3d, a machine so constructed must be precipitated from a height or driven along the surface of the land or water at a high speed to supply it with initial velocity; 4th, it is unfitted for flying with the wind unless its speed greatly exceeds that of the wind; 5th, it is unfitted for flying across the wind because of the large surfaces exposed; 6th, the sustaining surfaces are passive or dead surfaces, *i. e.*, they have no power of moving or accommodating themselves to altered circumstances. Natural wings, as explained, present small flying surfaces, and these can be applied to the air at any degree of obliquity—the great speed at which wings are propelled converting the spaces through which they pass into what are practically solid bases of support, as indicated at pp. 271, 274 (figs. 9, 20, 21, 22, and 23).

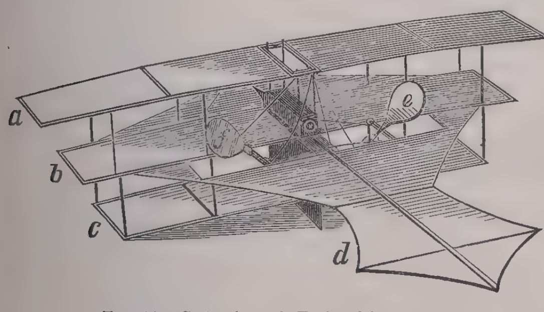

Fig. 44.—Stringfellow's Flying Machine (1868).

This arrangement enables natural wings to seize and utilize the air, and renders them superior to adventitious currents. Natural wings work up the air in which they move; but unless the volant animal desires it, they are scarcely, if at all, influenced by winds or currents which are not of their own forming. In this respect they differ entirely from the balloon and all forms of fixed aëro-planes. In nature small wings driven at a high speed produce the same result as large wings driven at a low speed. In flight a certain space must be covered, either by large wings spread out as solids, or by small wings made to vibrate rapidly. A like result is obtained if air currents travelling at a high speed strike the under surfaces of the wings of the volant animal. In the former cases the wings are active, the air passive; in the latter case the air is active and the wings passive.

It would be easy to multiply almost indefinitely our list of aërial models and flying machines.[1] As however the present article has already attained sufficiently large dimensions it will suffice if we refer in conclusion to the aërial steamer of Mr. Moy, designed in 1874, and still in process of construction. Its leading features will readily be understood by a reference to the annexed drawing (fig. 45).

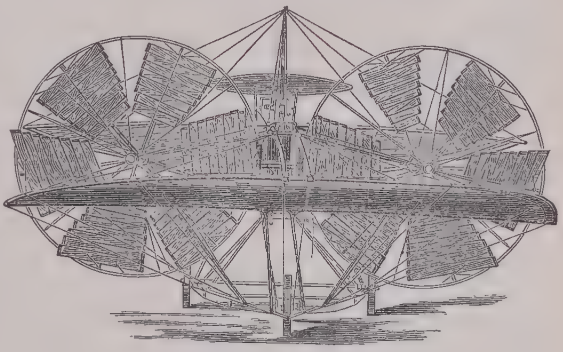

Fig. 45.—Moy's Aërial Steamer (1874).

Mr. Moy's invention consists of a light, powerful, skeleton frame resting on three wheels; a very effective light engine constructed on a new principle, which dispenses with the old-fashioned, cumbrous boiler; two long, narrow, horizontal aëro-planes; and two comparatively very large aërial screws. The idea is to get up the initial velocity by a preliminary run on the ground. This accomplished it is hoped that the weight of the machine will gradually be thrown upon the aëro-planes in the same way that the weight of certain birds—the eagle, *e.g.*—is thrown upon the wings after a few hops and leaps. Once in the air the aëro-planes will become effective in proportion to the speed attained. Mr. Moy's machine resembles in its general features that of Mr. Stringfellow. It repeats its defects as far as rigid surfaces are concerned, but it has the advantage in presenting a relatively less amount of surface. The diminished surface of Mr. Moy's machine is, moreover, more broken up, and what is important, a relatively greater proportion of the surface (so diminished and broken up) is made active or moving surface. These are hopeful features.

The unremitting efforts of Mr. Moy and other British engineers to construct flying machines deserve well of science. They are significant as showing that the great subject of aërial navigation is at length receiving a fair share of the thought and energy of a country which has already produced the steamboat and locomotive, and which, there is good reason to believe, is destined also to produce the flying machine. (J. B. P.)

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[1] The most recent experiments in aërial transit are described in the *Transactions of the New Zealand Institute*, vol x., 1878.

FLINCK, GOVERT (1615–1660), born at Cleves in 1615, was apprenticed by his father to a silk mercer, but having secretly acquired a passion for drawing, was sent to Leuwarden, where he boarded in the house of Lambert Jacobszon, a Mennonite, better known as an itinerant preacher than as a painter. Here Flinck was joined by Jacob Backer, and the companionship of a youth determined like himself to be an artist only confirmed his passion for painting. Amongst the neighbors of Jacobszon at Leuwarden were the sons and relations of Rombert Ulenburg, whose daughter Saske married Rembrandt in 1634. Other members of the same family lived at Amsterdam, cultivating the arts either professionally or as amateurs. The pupils of Lambert probably gained some knowledge of Rembrandt by intercourse with the Ulenburgs. Certainly Sandrart, who visited Holland in 1637, found Flinck acknowledged as one of Rembrandt's best pupils, and living habitually in the house of the dealer Hendrik Ulenburg at Amsterdam. For many years Flinck labored on the lines of Rembrandt, following that master's style in all the works which he executed between 1636 and 1648; then he fell into peculiar mannerisms by imitating the swelling forms and grand action of Rubens's creations. Finally he sailed with unfortunate complacency into the Dead Sea of official and diplomatic painting. Flinck's relations with Cleves became in time very important. He was introduced to the court of the Great Elector, Frederick William of Brandenburg, who married, in 1646, Louisa of Orange. He obtained the patronage of Johann Moritz of Orange, who was made stadtholder of Cleves in 1649. In 1652, a citizen of Amsterdam, Flinck married in 1656 an heiress, daughter of Ver Hoeven, a director of the Dutch East India Company. He was already well known even then in the patrician circles over which the burgomasters De Graef and the Echevin Six presided; he was on terms of intimacy with the poet Vondel and the treasurer Uitenbogaard. In his house, adorned with antique casts, costumes, and a noble collection of prints, he often received the stadtholder Johann Moritz, whose portrait is still preserved in the work of the learned Barleius.

The earliest of Flinck's authentic pieces is a likeness of a lady, dated 1636, in the gallery of Brunswick. His first subject picture is the Blessing of Jacob, in the Amsterdam museum (1638). Both are thoroughly Rembrandtesque in effect as well as in vigor of touch and warmth of flesh tints. The four "civic guards" of 1642, and "the twelve musketeers" with their president in an arm-chair (1648), in the town-hall at Amsterdam, are fine specimens of composed portrait groups. But the best of Flinck's productions in this style is the Peace of Münster in the museum of Amsterdam, a canvas with 19 life-sized figures full of animation in the faces, "radiant with Rembrandtesque color," and admirably distributed. Flinck here painted his own likeness to the left in a doorway. The mannered period of Flinck is amply illustrated in the Marcus Curius eating Turnips before the Samnite Envoys, and Solomon receiving Wisdom, in the palace on the Dam at Amsterdam. Here it is that Flinck shows most defects, being faulty in arrangement, gaudy in tint, flat and shallow in execution, and partial to whitened flesh that looks as if it had been smeared with violet powder and rouge. The chronology of Flinck's works, so far as they are seen in public galleries, comprises, in addition to the foregoing, the Grey Beard of 1639 at Dresden, the Girl of 1641 at the Louvre, a portrait group of a male and female (1646) at Rotterdam, a lady (1651) at Berlin. In November, 1659, the burgomaster of Amsterdam contracted with Flinck for 12 canvases to represent four heroic figures of David and Samson and Marcus Curius and Horatius Cocles, and scenes from the wars of the Batavians and Romans. Flinck was unable to finish more than the sketches. In the same year he received a flattering acknowledgment from the town council of Cleves on the completion of a picture of Solomon which was a counterpart of the composition at Amsterdam. This and other pictures and portraits, such as the likenesses of Frederick William of Brandenburg and Johann Moritz of Nassau, and the allegory of Louisa of Orange attended by Victory and Fame and other figures at the cradle of the first-born son of the elector, have disappeared. Of several pictures which were painted for the Great Kurfürst, none are preserved except the Expulsion of Hagar in the Berlin museum. Flinck's death at Amsterdam on the 22d of February, 1660, was sudden and unexpected.

FLINDERS, MATTHEW (1774–1814), English navigator, explorer, and man of science, was born at Donington, near Boston, in Lincolnshire, March 16, 1774. Matthew was at first designed to follow his father's profession of surgeon, but his enthusiasm in favor of a life of adventure impelled him to enter the royal navy, which he did, October 23, 1789. After a voyage to the Friendly Islands and West Indies, and after serving in the "Bellerophon" during Lord Howe's "glorious first of June" (1794) off Ushant, Flinders went out in 1795 as midshipman in the "Reliance" to New South Wales. For the next few years he devoted himself to the task of accurately laying down the outline and bearings of the Australian coast, and he did his work so thoroughly that he left comparatively little for his successors to do. With his friend George Bass, the surgeon of the "Reliance," in the year of his arrival he explored George's River; and, after a voyage to Norfolk Island, again in March, 1796, the two friends in the same boat, the "Tom Thumb," only 8 feet long, and with only a boy to help them, explored a stretch of coast to the south of Port Jackson. After a voyage to the Cape of Good Hope, when he was promoted to a lieutenancy, Flinders was engaged during February, 1798, in a survey of the Furneaux Islands, lying to the north of Tasmania. His delight was great when, in September of the same year, he was commissioned along with Bass, who had already explored the sea between Tasmania and the south coast to some extent and inferred that it was a strait, to proceed in the sloop "Norfolk" (25 tons) to prove conclusively that Van Diemen's Land was an island by circumnavigating it. In the same sloop, in the summer of next year, Flinders made an exploration to the north of Port Jackson, the object being mainly to survey Glasshouse Bay (Moreton Bay) and Hervey's Bay. Returning to England he was appointed to the command of an expedition for the thorough exploration of the coasts of Terra Australis, as the southern continent was still called, though Flinders is said to have been the first to suggest for it the name Australia. On July 18, 1801, the sloop "Investigator" (334 tons), in which the expedition sailed, left Spithead, Flinders being furnished with instructions and with a passport from the French Government to all their officials in the Eastern seas. Among the scientific staff was Robert Brown, one of the most eminent English botanists; and among the midshipmen was Flinders's relative, John Franklin, of Arctic fame. Cape Leeuwin, on the south-west coast of Australia, was reached on November 6, and King George's Sound on December 9. Flinders sailed round the Great Bight, examining the islands and indentations on the east side, noting the nature of the country, the people, products, etc., and paying special attention to the subject of the variation of the compass. Spencer and St. Vincent Gulfs were discovered and explored. On April 8, 1802, shortly after leaving Kangaroo Islands, at the mouth of St. Vincent Gulf, Flinders fell in with the French exploring ship, "Le Géographe," under Captain Nicolas Baudin, in the bay now known as Encounter Bay. In the narrative of the French expedition published in 1807 (when Flinders was a prisoner in the Mauritius) by M. Peron, the naturalist to the expedition, much of the land west of the point of meeting was claimed as having been discovered by Baudin, and French names were extensively substituted for the English ones given by Flinders. It was only in 1814, when Flinders published his own narrative, that the real state of the case was fully exposed. Flinders continued his examination of the coast along Bass's Strait, carefully surveying Port Phillip. Port Jackson was reached on May 9, 1802.

After staying at Port Jackson for about a couple of months, Flinders set out again on July 22 to complete his circumnavigation of Australia. The Great Barrier Reef was examined with the greatest care in several places. The north-east entrance of the Gulf of Carpentaria was reached early in November; and the next three months were spent in an examination of the shores of the gulf, and of the islands that skirt them. An inspection of the "Investigator" showed that she was in so leaky a condition that only with the greatest precaution could the voyage be completed in her. Flinders completed the survey of the Gulf of Carpentaria, and after touching at the island of Timor, the "Investigator" sailed round the west and south of Australia, and Port Jackson was reached on June 9, 1803. Much suffering was endured by nearly all the members of the expedition: a considerable proportion of the men succumbed to disease, and their leader was so reduced by scurvy that his health was greatly impaired.

Flinders determined to proceed home in H. M. S. "Porpoise" as a passenger, submit the results of his work to the Admiralty, and obtain, if possible, another vessel to complete his exploration of the Australian coast. The "Porpoise" left Port Jackson on August 10, accompanied by the H. E. I. C.'s ship "Bridgewater" (750 tons) and the "Cato" (450 tons) of London. On the night of the 17th, the "Porpoise" and "Cato" suddenly struck on a coral reef, and were rapidly reduced to wrecks. The officers and men encamped on a small sandbank near, 3 or 4 feet above high water, a considerable quantity of provisions, with many of the papers and charts, having been saved from the wrecks. The reef was in about 22° 11′ S. and 155° E., and about 800 miles from Port Jackson. Flinders returned to Port Jackson in a six-oared cutter in order to obtain a vessel to rescue the party. The reef was again reached on October 8, and all the officers and men having been satisfactorily disposed of, Flinders on the 11th left for Jones Strait in an unsound schooner of 29 tons, the "Cumberland," with ten companions, and a valuable collection of papers, charts, geological specimens, etc. On December 15 he put in at Mauritius, when he discovered that France and England were at war. The passport he possessed from the French Government was for the "Investigator;" still, though he was now on board another ship, his mission was essentially the same, and the work he was on was simply a continuation of that commenced in the unfortunate vessel. Nevertheless, on her arrival at Port Louis the "Cumberland" was seized by order of the governor-general De Caen. Flinders's papers were taken possession of, and he found himself virtually a prisoner. We need not dwell on the sad details of this unjustifiable captivity, which lasted to June, 1810. But there can be no doubt that the hardships and inactivity Flinders was compelled to endure for upwards of six years told seriously on his health, and brought his life to a premature end. He reached England in October, 1810, after an absence of upwards of nine years. The official red-tapeism of the day barred all promotion to the unfortunate explorer, who set himself to prepare an account of his explorations, though unfortunately an important part of his record had been retained by De Caen. The results of his labors were published in two large quarto volumes, entitled *A Voyage to Terra Australis*, with a folio volume of maps. The very day (July 19, 1814) on which his work was published Flinders died, at the early age of forty. The great work is a model of its kind, containing as it does not only a narrative of his own and of previous voyages, but masterly statements of the scientific results, especially with regard to magnetism, meteorology, hydrography, and navigation. Flinders paid great attention to the errors of the compass, especially to those caused by the presence of iron in ships. He is understood to have been the first to discover the source of such errors (which had scarcely been noticed before), and after investigating the laws of the variations, he suggested counter-attractions, an invention for which Professor Barlow got much credit many years afterwards. Numerous experiments on ships' magnetism were conducted at Portsmouth by Flinders, by order of the Admiralty, in 1812. Besides the *Voyage*, Flinders wrote *Observations on the Coast of Van Diemen's Land, Bass's Strait*, etc., and two papers in the *Phil. Trans.*,—one on the "Magnetic Needle" (1805), and the other "Observations on the Marine Barometer" (1806). (J. S. K.)

FLINT is a calcedonic variety of silica found in the form of irregular concretionary nodules of varying size, chiefly in the Upper Chalk beds and in other similar limestone deposits. The mode in which flint originated is not altogether satisfactorily explained; but as traces of some of the humbler marine organisms are almost invariably found in the nodules, it is assumed that the siliceous matter was partly derived from these organisms themselves, and that they formed nuclei around which soluble silica accumulated. From the prevalence of siliceous spiculæ of sponges in the nodules, it is affirmed by Dr. Bowerbank that all flints had, for their primary nuclei, the siliceous framework of the sponges which flourished in the depths of the sea during the Cretaceous epoch. Flints occur in the chalk in stratified order, and the various beds are possessed of a uniformly distinctive character. In some cases they are found in continuous layers, at other places they occur as isolated nodules. In the county of Norfolk, huge flints termed "potstones," of a pear-shaped outline, measuring as much as three feet in length by one foot across, are obtained; and these are embedded in the chalk at right angles to the horizontal layers of small flints. Flint is a compact homogeneous substance, externally coated with a white siliceous coat, and frequently hollow in the centre. It has a dark steely gray, almost black, sometimes brownish color; it is faintly translucent, and it breaks with a conchoidal or glassy fracture. In composition it consists of almost pure silica, partly in the crystalline or non-soluble quartzy form, and partly in the non-crystalline soluble state. It contains traces of lime, iron, and alumina, and when the proportion of lime present is large it passes into chert. When newly obtained from the pits the contained moisture of flint renders it easily flaked and otherwise worked, but after exposure to the air it becomes dry, hard, and intractable. From the earliest times flint has been employed as a fire-producer, by percussion with iron pyrites, and subsequently with a steel implement in the yet familiar form of "flint and steel." In classical authors occasional allusions are made to the use of flint knives; and the employment of flint and steel to produce fire is very pointedly described by Virgil and other writers. Except to a trifling extent in the preparation of strike-a-light flints, the only form in which flint industry now continues is in the fabrication of gun-flints, an occupation carried on at Brandon, and to a smaller extent at Icklingham, two villages in Suffolk. In 1876 there were 21 flint knappers in Brandon, and about 80,000 flints were sent away weekly, the greater proportion of which go to West Africa. The mining for flints is conducted by sinking a narrow pit into the chalk till the bed of suitable flints (the best are "floor-stones") is reached, and along this the miner drives a series of small galleries or burrows, carrying all the excavated material by hand to the surface. The knapper's tools consist of three simple forms of hammer and a chisel; and probably the only essential modification these tools have ever undergone consists in the substitution of metal for stone. The flint is first broken into convenient sized angular pieces, cubes of about 6 inches, called "quarters." The next operation, "flaking," consists in striking off, by means of carefully measured and well directed blows, flakes extending from end to end of the quarter, this process of flaking being continued till the quarter or core becomes too small to yield good flakes. The subsequent operation termed "knapping" consists in cutting or breaking the flakes transversely into the sizes required for gun-flints, each flake yielding two or three flints of different sizes. An expert flaker will make 7000 to 10,000 flakes in a day of twelve hours, and in the same time an average knapper will finish from flakes about 3000 gun-flints. Flint is also employed in building and for road metal. Calcined and powdered it is very much used in the manufacture of superior kinds of pottery. For the flint implements of primitive times, see ANTHROPOLOGY, vol. ii. p. 102, and ARCHÆOLOGY, vol. ii. p. 295.

FLINT, a maritime county of North Wales, the smallest but one of the Welsh and English counties, has an area of 264 square miles, or 169,162 acres; and (excluding the detached hundred of Maelor, which is divided from Denbighshire by the Dee, and bounded N. by Cheshire and S. and E. by Salop, lying 8 miles to the S.E. of the rest of the county) its boundaries are the estuary on the N., Cheshire on the N. and N.E., and Denbighshire with the Clwydian range to the S. and S.W. The greatest length of the county from S.E. to N.W. is 26 miles, and its breadth is from 10 to 12—Maelor being 9 miles by 5. The chief part of it is situate on the Coal-Measures and other members of the Carboniferous rocks group. A hilly tract of 50 miles breadth separates the Anglesey Coal-Measures from the Flintshire coal-field, which is again separated from that of Denbighshire to S.E. by the elevation of Mountain Limestone and Millstone Grit between Gresford and Hope. The latter runs continuously along the southern edge of the coal strata, followed, except in the extreme south, where we have the Wenlock rocks, by the Mountain Limestone. The extreme west and east, as well as the detached hundred, of the county is on the New Red Sandstone. Symonds says,—"The coal measures may be traced along the shore from Flint to the Point of Air; and the route from Flint to the west of Holywell crosses the Millstone Grit to the Mountain Limestone." The Wenlock rocks, of considerable altitude, forming the northern limb of the Berwen mountains, extend to within a mile of the shore of the Dee, near the western limit of the county, the margin still west being composed of the alluvial flat of Rhuddlan marsh and part of the vale of Clwyd. To the south the water-shed of the Berwens divides Flintshire and Denbighshire for some distance,—Moel Fammau, a member of the range common to both, rising to 1845 feet. This is high for Flintshire, though Buckley and Halkin mountains, with the rest of the hill system north and south, indicate a generally mountainous character. A narrow alluvial tract to the east lies parallel to that already mentioned in the extreme west, and both are connected by a fertile strip of reclaimed land on the south shore of the estuary. The hundred of Maelor is flat, fertile, and highly picturesque.

Flint has some lovely valleys, such as those of the Clwyd, partly in the county, and the Alyn, and dingles and ravines, such as the course of the Wepre brook from Ewloe Castle to the Dee. The chief rivers are the Dee, Clwyd, and Alyn. The Dee, entering the county near Overton, divides Maelor from Denbighshire on the west, and, after passing Chester, bounds it also on the north. The Clwyd, rising in Denbighshire, enters Flintshire near Bodfary, and after a brief northward course, joins the Elwy near Rhuddlan, past which they flow in one channel into the Irish Sea near Rhyl. The Alyn, a Denbighshire tributary, enters Flintshire near the base of Moel Fammau, winds between Cilcen and Mold,—with an underground course of half a mile, like fabled Alpheus, near Hesp-Alyn,—and then bending south to Caergwyrle, re-enters Denbighshire to join the Dee. Of Flintshire lakes, unimportant compared with those of neighboring counties, Llyn Helig near Whitford is the chief.

Sloping seaward, with a mild climate, a moderate elevation and shelter, and sufficient irrigation, Flintshire is well adapted for agriculture. Three-fourths of its area is under cultivation, as follows:—

Under corn crops..............	31,740	acres, of which wheat and oats occupy each one-third, and barley one-fourth.
Under green crops...........	8,315	acres, of which potatoes occupy one-fourth.
Under grass under rotation	16,809	acres.
Under permanent pasture...	66,509	acres.
Bare, fallow, etc...............	2,901	acres.
Total in cultivation.....	126,274	acres.

Of green crops, turnips and swedes are the chief; mangolds are little grown. To every 100 acres of cultivated land the proportion of horses is 4·5, of cattle 42·4, of sheep 100·8, and of pigs 11·8,—the cattle and pigs being about the same proportion as for Denbighshire, while the horses and sheep number only about one-half. Stock and dairy farming are keenly pursued by the Flintshire farmer, who crosses his native cattle with Herefords and Downs, his native sheep with Leicesters and Southdowns. Flintshire farms are of more than average size, and their occupiers are intelligent and progressive. In the thickly planted mining population they find a ready market for beef and mutton, as well as for cheese and butter.

With this important increment to their agricultural population, the census of 1871 gives Flintshire a population of 76,312, or an increase in ten years of above 6500. In 1801 the number was 39,469, so that the increase during the century has been nearly double. Flint is now one of the most densely peopled counties for its size, ranking the third in numbers of North Wales. Its collieries, of which there are 27 of note in the county, producing an annual average of 500,000 tons, begin at Llanasa, and run south-east through Whitford, Holywell, Flint, Halkin, Northop, Buckley, Mold, and Hawarden. Much of the yield is exported. Lead is raised in Halkin mountain, and in some nine or ten mines of note about Mold, Holywell, Prestatyn, and Talacre, near Llanasa, the average annual produce being about 1200 tons. The town of Holywell has been reckoned the headquarters of the "lead ore ticketings." In some cases it is smelted on the spot. Elsewhere it is sent to Bagilt, Flint, or Chester for that purpose. At Dyserth zinc is worked to a limited extent, and copper in Talargoch mine. Flintshire has also calamine mines; and in addition to frequent smelting works, large manufactories of oil, vitriol, potash, etc., employ the dwellers near the coast, while coarse clay-potteries, the products of which go by train and rail to Connagh's Quay, occupy those around Buckley. Little ironstone is now raised, the seams being thin and the yield low; but an important source of industry is the large limestone quarries, eight in number, which produce a quantity of building stone, burnt lime, and small stone for chemical works about Halkin and elsewhere.

In 1873 the county was divided between 3510 owners, of whom 2048, or 58 per cent. possessed less than one acre, or much the same proportion as Denbighshire (see vol. vii. p. 68). The average size of properties was 40½ acres, the average value per acre £2 13s. 8½d. More than one-third of the county is owned by 13 proprietors, viz., Lord Hanmer (Hanmer Hall), 7318 acres; Captain Conwy (Rhyl), 5526; Mostyn Trustees, 5460; Right Hon. W. E. Gladstone, 6908; Sir Piers Mostyn (Talacre), 4186; Sir Hugh Williams (Bodelwyddan), 4011; Lord Kenyon (Gredington), 4004; River Dee Company, 3679; Duke of Westminster (Halkin Castle), 3338; P. B. D. Cooke (Gwysaney), 3204; Earl of Denbigh (Downing), 2938; Edmund Peel (Overton), 2897; W. R. Hughes (St. Asaph), 2119. The county petty sessional divisions are—Mold; Northop; Hawarden and Broughton; Caergwyrle; Holywell; Caerwys; Rhyl, Prestatyn, and St. Asaph; and Hanmer. Flint borough has its separate commission of the peace, the borough magistrates holding their petty sessions at the town-hall for the borough district. The whole county constitutes one lieutenancy, and there are no highway districts. The principal towns are Flint, Mold, St. Asaph, Rhyl, Holywell.

Flint (said to be derived from a corruption of the documentary term "Castellum apud Fluentum" into "Apud le Flynt") is the capital and sole corporate town of the county, a seaport and contributory borough, 173 miles from London, on the south of the Dee estuary, between the sea and the hills inland. It has some good houses, and has recovered its decadence of twenty years ago since the establishment of vast chemical works, which make it the seat of great alkali manufactures, by Messrs. Muspratt Brothers, Huntley, and others. Its chief imports are sulphur and other chemicals; its exports coal, soda, potash, copper, and various chemical products. The church is not remarkable; but there are good parochial schools and several nonconformist chapels. The footways of the town are flagged, and there are other street improvements. Until five years ago the county jail occupied (as at Haverfordwest) an angle of the Edwardian Castle on the edge of the estuary; it was then removed to Mold—where, however, the new and costly jail has been closed by the New Prisons Act, and Flintshire prisoners are now sent to Chester Castle. The old Flint jail has been bought by the Messrs. Muspratt, and turned to good use as a "working men's club." It was in Flint Castle that Percy betrayed Richard II. to Bolingbroke in 1399. In 1643 it surrendered to the Roundheads, and four years later was dismantled. Its constable is still appointed by the crown, with duties limited since the Municipal Corporations Reforms Act to the care of the ruins,—a square court with towers at the angles abutting the sea, and a massive round tower with a drawbridge. Flint was made a borough by Edward I., and chartered by Edward III. and Edward the Black Prince, as earl of Chester. Since the Reform Act it is governed by a mayor, 4 aldermen, and 12 councillors. It is the nomination place for the group of contributory boroughs, viz., Flint, Caergwyrle, Caerwys, Overton, Rhuddlan, which with St. Asaph, Holywell, and Rhyl returns one member of parliament. In 1871 the population of Flint was 4269, as against 3296 in 1851.

Mold is a well-built town on the Alyn, in the south-east of Flintshire, the centre of a great coal and lead district, a terminus of the Chester and Holyhead branch railway, the assize town of the county, and the great locale of county business. Its restored church of the early 16th century is one of the finest in the diocese; and the Bailey Hill is the site of an ancient fortress stormed in 1144 and in 1322. The population of Mold is 12,237 by the last census.

St. Asaph, one of the four Welsh sees, and a cathedral town, lies near the confluence of the Elway and Clwyd. Founded originally by Kentigern, bishop of Glasgow, and named after his successor Asa, or Asaph, it still possesses, outlasting the buffets and vicissitudes of ages, its plain yet massive cruciform church. The population in 1871 of that part of the town which is situated in the county of Flint was 2806.

At the same census the winter population of the flourishing watering-place of *Rhyl* is given as 4229; but its summer average is from 10,000 to 12,000,—railway and water facilities bidding fair to eclipse the ancient neighboring borough of *Rhuddlan*, which was once of such importance that Edward I. held his parliament in it, and the Statutes of Rhuddlan were passed there. Population of Rhuddlan, 5525.

Holywell depends for its prosperity on its lead mines and lime-works, its copper, brass, and zinc, and its lead smelting. At the last census its population was 9980. It has a railway station on the Chester and Holyhead line, two miles from the town, and within a hundred yards of the Cistercian abbey of Basingwerk. Closer still is St. Winifred's well, the exquisite late Perpendicular chapel above which has been restored. Other places of antiquarian interest are Caerwys, on the Mold and Denbigh railway—with its streets at right angles and other indications of Roman occupation; Hope, or Hope Estyn, near Caergwyrle; and Overton, in the detached part of Flint. Bodfary retains the tradition of Roman occupation. There is a fortified British post at Moel-y-Gaer, near Northop, and a roadway at Halkin, near Whitford.

The history and antiquities of Flintshire are of some importance. Maes-y-Garmon, a mile from Mold, is the scene of the bloodless victory of the Britons under Germanus and Lupus over the Picts and Scots in 430 A.D., remembered as the "Alleluia victory." Bangor Iscoed, "the great high choir in Maelor," preserves the site of the monastery suddenly and totally destroyed with more than 2000 monks by Ethelfred of Northumberland in 607. Watt's Dyke and Offa's Dyke—supposed to have run, the former from the coast near Basingwerk, past Halkin, Hope, and the Alyn gorge, towards Oswestry, and the latter from Prestatyn southward towards Mold, Minera, and across the Severn over the Long Mountain—perpetuate the names, one of a local hero, the other of a great Mercian ruler. At Cynsyllt, or Coleshill, is the scene of a second defeat of Henry II. by Owain Gwynedd about a mile from Flint, the first having been at Coed Ewloe, where a lone tower remains to recall the tale. Tumuli, maenhirs, and inscribed stones are frequent in Flintshire, the most remarkable of the last being the "Maen Achwynfan" of the 9th to 12th century near Pantasa, and the 14th-century cross in Newmarket church-yard. Most of the Flint castles are Edwardian, that at Caergwyrle bespeaking an earlier Roman and even British occupation.

Flintshire is well provided with public elementary schools, viz., 68 voluntary and 4 board schools, and Church of England Sunday-schools. It belongs to the diocese of St. Asaph.

On the history of the county may be consulted *Archæologia Cumbrensis*, 3d series, vol. iii.; Thomas, *History of the Diocese of St. Asaph*, 1874; Pennant's *Tour in Wales*; Nicholas, *Annals of Welsh Counties and County Families*; *Notes on the History of the County Town of Flint*, by Henry Taylor, town-clerk of Flint, 1875; Murray's *Handbook of N. Wales*, 1874.

(J. DA.)

FLINT, Timothy (1780–1840), an American clergyman and writer, was born in Reading, Massachusetts, July 11, 1780. He graduated at Harvard College in the close of 1800. Settled as a Congregational minister in Lunenburg, Massachusetts, he pursued scientific studies with interest; and his labors in his laboratory seemed so strange to the people of that retired region, that some persons supposed and asserted that he was engaged in counterfeiting. This led to disagreeable complications, which resulted in his leaving his parish and becoming a missionary in the valley of the Mississippi. There could have been no discipline better adapted to correct his natural sensitiveness than his work at the West in those days, where he came into contact with many rough people and peculiar social habits. His observations on the manners and character of the settlers of the Ohio and Mississippi valleys were recorded in a very picturesque work called *Recollections of Ten Years passed in the Valley of the Mississippi*, Boston, 1826. This book passed to a second edition, and excited so much interest as to be translated into French as well as reprinted in England. Indeed, it was the first account of the Western States of America which brought to light the real life and character of the people. Flint had acquired this knowledge of the young communities of the West, not only by his journeys among them as an itinerant preacher, but also by having been for a short period teacher and farmer on the banks of the Mississippi and Red Rivers. The success which this work met with, together with the failing health of the writer, led him to relinquish his more active labors for literary pursuits. His subsequent publications were as follows:—*Francis Berrian, or the Mexican Patriot*, 1826,—a novel, the scene of which is laid in Mexico at the period of the revolution in which Iturbide was overthrown; *A Condensed Geography and History of the Western States in the Mississippi Valley*, 2 vols. 8vo, Cincin., 1828; *Arthur Clenning*, a novel, 1828; *George Mason, the Young Backwoodsman*, a novel; *Indian Wars in the West*, 1833; *Memoir of Daniel Boone*, 1834. In addition to these works, Flint published several translations from the French, and essays in the London *Athenæum*, the *Western Review*, and the *New York Knickerbocker*, of which last two magazines he was at different times editor. His style was vivid, plain, and forcible, and his matter interesting; the spirit of his writings was always humane and genial; the *Quarterly Review*, in a notice of his first book, says: "These pages reflect a sincere, humane, and liberal character, a warm and gentle heart, and hardly even a prejudice which is not amiable." He was very industrious, and had acquired such a power of abstraction that he prosecuted the labor of translating the *Biographie Universelle* in a room where other persons were engaged in work or conversation, being so absorbed in his work as to lose all consciousness of where he was or who was present. He died in Salem, August 16, 1840. His works on the Western States are still among the best we have on the subject.

FLODOARD, or Frodoart (894–966), a French chronicler, was born at Epernay in 894. He was educated at Rheims, and for some time held the office of canon in the cathedral of that city. The later years of his life were spent in retirement at a neighboring monastery, and were devoted to study and the exercises of piety. He died 28th March, 966. His works are the most important contribution to the French literature of his time, and consist of *Histoire de l'église de Rheims*; *Chronique sacrée*, a poetical history of Jesus Christ, the apostles, the popes, and the saints and martyrs of the church; and *Chronicon Rerum inter Francos gestarum*, which, beginning with the year 919 and ending with 966, throws more light than any other document on the annals of the 10th century. This work was first printed in the *Rerum Burgundicarum Chronicon*, Basel, 1575; and a translation of it was inserted by Guizot in his *Collection des Mémoires relatifs à l'Histoire de France*. The prose of Flodoard is very correct and elegant, but his poetry is no exception to the mechanical, unmusical, and common-place verses belonging to this period of literature.

FLOOD. See Deluge.

FLOOD, Henry (1732–1791), an eminent Irish orator and politician, born in 1732, was the son of the Right Honorable Warden Flood, chief-justice of the Queen's Bench in Ireland. He came of an old Kentish family, a branch of which had settled in Kilkenny during the Civil War. At the age of fifteen he was sent to Trinity College, Dublin; and he subsequently studied at Oxford under Markham, afterwards archbishop of York. On leaving the university with a good reputation for classical scholarship he proceeded to the Temple. Possessing a competent fortune, high social position, and considerable family influence, he determined to devote himself to a political life, and obtained a seat in the Irish House of Commons for his own county of Kilkenny. His abilities soon placed him in the position of a leader of the opposition or popular party, to which he rendered good service on several occasions. Among his more intimate friends at this time were the agreeable and gifted Lord Charlemont, Mr. Bushe, and the famous Grattan, who owed a good deal to Flood's assistance in entering upon public life. Though somewhat too solemn and dignified, Flood was an orator of considerable power, and especially master of that unsparing invective which was then one of the best employed weapons of debate, and which often degenerated into what would now be considered unwarrantable personalities. At that time, indeed, political rivalry frequently ended in personal hatred. In 1769 Flood had the misfortune to be involved in an election quarrel with a Mr. Agar. The result was a duel, and on the second exchange of shots Agar was mortally wounded. Flood was brought to trial, but acquitted. In 1775 Flood was persuaded to an act which seriously diminished his influence. He accepted the office of vice-treasurer under Lord Harcourt and the duke of Buckingham. But in 1780, in consequence of his strong sympathy with the cause of Irish independence and his position as lieutenant-colonel of the Irish volunteers, he felt obliged to resign this office, and in consequence he was removed by the Government from the council, treatment which he bitterly resented. His influence was now entirely devoted to the support of the popular party, which in fact he had never deserted. He was present at the great armed convention of the volunteers which met at Dungannon, and proposed a resolution that the powers exercised by the Privy Council were unconstitutional. After the passing of the Irish Bill of Right through the splendid efforts of Grattan, Flood made an attempt to achieve what he considered would be a still greater triumph. He declared that the mere repeal of the Act (6 Geo. I.) which had subjected Ireland to the control of the English parliament was not enough, and insisted upon an express renouncement of the right of the English parliament to interfere in any way with the government of Ireland. Grattan, maintaining that his own measure was sufficient, vigorously opposed the bill which Flood introduced; and the two orators, forgetting their old friendship, exchanged speeches full of the bitterest personal invective. The quarrel was about to end in a duel, and arrangements were actually being made for a meeting, when the affair was discovered, and both were bound over to keep the peace. Flood's bill was completely defeated, for it was altogether unnecessary, and could only have served as a triumph to Irish national vanity. In 1783 Flood obtained a seat in the English House of Commons (while retaining his seat in the Irish House), being elected M. P. for Winchester. He was afterwards (1785) member for Seaford. But his success was not such as he had enjoyed in Ireland, and his career in the English parliament was not of much importance. Perhaps his greatest effort was his speech against Pitt's famous commercial treaty. Flood died on the 2d December, 1791. He left £5000 a year to Trinity College, Dublin, part of which was to found a professorship of Irish and furnish prizes for English and Irish composition, but this destination of the bequest was set aside.

FLOOR CLOTH is a covering for the floors of lobbies, halls, passages, and other situations where there is much traffic and heavy wear. Originally floor-cloth consisted of a heavy canvas coated with painters' colors and ornamented with patterns executed with the brush. At a later period stencilled ornaments took the place of hand-painted patterns, and now ornamental designs are applied solely by means of hand-blocks. Kirkcaldy, in Scotland, is the leading centre of the oil floor-cloth manufacture, in which town it was firmly established by the energy of the late Michael Nairn—the operations of the firm founded by him being, it is understood, the most extensive in the trade. The brief outline of the manufacture which follows represents the processes as conducted in the extensive establishments of Shepherd and Beveridge of Kirkcaldy, where the mechanical and other arrangements have reached the highest perfection suggested by skill and experience.

The size of the canvas operated on, which must be free from all seams and joinings, is 8 yards wide by 25 yards long. The huge webs from which these canvases are cut are woven, chiefly in power-looms, in lengths of 150 yards, from which six floor-cloth pieces are obtained. For the cheaper qualities of floor-cloth jute canvas is employed, but in the best kinds the material is woven of stout tow yarn. The pieces of canvas in sizes above indicated are mounted on a series of stout wooden stretching frames, ranged about 30 inches apart from each other in a lofty, well-ventilated hall. The back or under part of the floor-cloth is first dealt with, the first operation being to coat the whole surface with thin size, which fills up the interstices and prevents the oil of the pigment from penetrating and rotting the fibres. The paint, which is next applied, is of the consistency of a thin plaster, and is made up of raw oil, some turpentine, and ochre, umber, and other earthy pigments. It is laid on, not with brushes, but with long trowels, the operation being called "trowelling," and the workmen go over a large surface with great expedition. When the operation is complete, the iron doors of the hall are closed and streams of heated, slightly moist air are blown by a fan blast into the apartment, a temperature of from 78° to 90° Fahr. being then maintained. The moisture in the heat is essential for keeping the paint while drying from shrinking, cracking, and scaling off. When the paint is dry the whole surface is smoothed with pumice, and the back is finished with a coat of thinner color, in which boiled oil without turpentine is employed, thereby securing a glossy surface and finish. As soon as the back is dry the face or upper side has to be turned to the workmen, an operation which demands great caution and precision to prevent the canvas from being torn and destroyed. The lower edge being carried up and secured along the top of the frame, the upper part is suddenly detached and let down to the floor. The face receives, in succession, a coat of size and three "trowelling" coats, with pumicing between, and on the conclusion of these operations it is ready for printing. The printing is a costly process, owing to the great store of blocks which it is found necessary to provide and keep up; and the colors used are also expensive, consisting, as they do, of the fine bright pigments with a foundation of white lead. The blocks have a printing surface of 18 square inches, cut either of pear tree or other wood, or with faces of type metal cast in wood matrices, the interstices being filled up with felt. The cost is further increased by the laborious and tedious nature of the operations, the printing of an eight-color pattern over a full piece requiring no less than 7200 separate applications of the set of eight color blocks and one finishing block. The cloth is brought to the printing-room by a kind of overhead tramway arrangement, where it is passed over a long narrow table. At the side of this stands the printer; and the color-table, on which is spread the color he is to print, is mounted on rails which run parallel to the table over which the cloth is spread. Guide bars are arranged over the cloth to secure that the various impressions fall on their proper places with the utmost precision, and overhead are suspended from a spring beam, screw presses which travel from end to end of the table. The block having received the needful amount of color, and being laid in position over the cloth, receives, by means of the movable screw press, a tight elastic squeeze, which secures a uniform impression of the portion of the pattern brought out by one color. The various colors are so printed in in succession, and thereafter the whole is gone over with a finishing block, the surface of which is cut into fine straight grooves or lines. Finally, the finished cloth is moved to a drying room, where, suspended by the two extremities face outwards, it is left to harden and season.

Oil floor-cloth is open to the objection that it has a hard, cold, and uncomfortable surface, while it is almost as noisy to the tread as ordinary wooden flooring. Many substances have been proposed to supplant it, in which these objectionable features have been more or less overcome, while they retain its advantages of resistance to wear, cleanness, and freedom from damp. Of these bodies linoleum has proved most successful in experience, but various other materials of a similar kind have been introduced and used to a considerable extent.

Kamptulicon is a variety of floor-cloth, which, although invented about 1843, did not receive prominent public notice till the London International Exhibition of 1862. The materials and processes employed in its manufacture vary considerably, but it is essentially a preparation of india-rubber masticated up with ground cork, the preparation and mixture being effected by repeated passing of the material between grooved rollers. When thoroughly incorporated the preparation is rolled out into sheets, sometimes over a backing of canvas, by passing it between pairs of wide and heavy steam-heated rollers. In addition to the substances above mentioned, gutta-percha, sawdust, peat-dust, ground leather, boiled oil, resins, pitch, asphalt, tar, chalk, and fibrous residues have all been used in kamptulicon making. The rolled sheets are ornamented by printing simple patterns on their surface, but, as much of the peculiar advantages of kamptulicon would be lost were its whole surface covered with oil pigments, the kamptulicon surface is, as far as possible, left exposed. Kamptulicon forms a warm, pleasant, soft, and noiseless floor-cloth, but the higher qualities, in which india-rubber and ground cork are the main ingredients, are rather expensive, and the manufacture has been curtailed since the introduction of linoleum.

Linoleum.—This substance consists of oxidized linseed oil combined with ground cork, treated and rolled very much in the same manner as kamptulicon, to which, in appearance and properties, it bears a close resemblance. The manufacture was first conducted under a series of patents secured by Mr. F. Walton, the essential feature of his process—his method of oxidizing linseed oil—having been patented in January, 1860. The oxidation was effected by mixing the oil, perfectly clear and bright, with a suitable drier, by preference from 5 to 10 per cent. of acetate of lead being used, and spreading it in thin films on surfaces of considerable extent, which films were exposed to currents of heated air. In this way a rapid oxidation was induced, the oil being transformed into linoxein, a slightly elastic semi-resinous body, having many properties in common with india-rubber, with the advantage of a clear semi-translucent yellow color. In his patent of December, 1863, dealing chiefly with the production of colored patterns on linoleum, Mr. Walton specifies, as a suitable composition for the body of the material, 4 cwt. of oxidized oil, $1\frac{1}{2}$ cwt. of resin, $\frac{1}{2}$ cwt. of kaurie-gum and coloring matter, mixed together in a steam-heated pan and cast into cakes. It was afterwards to be mixed with an equal weight of cork dust, or a somewhat larger quantity of sawdust, and spread on and pressed into a woven fabric between steam-heated rollers. The breadth of the finished linoleum is determined by the breadth of the spreading rollers through which it passes; at present that does not exceed six feet. The manufacture of linoleum is rapidly extending, and since the expiry of Mr. Walton's patent rights, it has been begun by the leading Kirkcaldy floor-clothmakers.

Boulinikon.—Under this name a kind of floor-cloth with a lineoleum-like surface is manufactured of waste materials, by a process patented in January, 1865, by John B. Wood. It is composed of about equal portions of raw buffalo or other hide macerated and reduced to a pulp, pulped cotton or linen rags, and coarse hair ground up short and fine. These are mixed into a common pulp in a form of rag engine, and subsequently spread, drained, dried, and pressed on a machine similar to that used in the paper manufacture. The ornamentation is effected in the manner employed for kamptulicon and linoleum; but the substance may be entirely covered with pigment and finished like oil floor-cloth. (J. PA.)

FLOR, ROGER DI, a military adventurer who, in the early years of the 14th century, distinguished himself as leader of the Catalan Grand Company. He was the second son of a falconer in the service of the emperor Frederick II., and when eight years old was sent to sea in a galley belonging to the Knights Templars. He entered the order, and became commander of a galley. At the siege of Acre by the Saracens in 1291 he absented himself, took no part in the defence of the town, and was accused of appropriating to his own use the treasures of his order. He was denounced to the pope by the grand master as a thief and an apostate, was degraded from his rank, and threatened with arrest. To escape imprisonment he fled to Genoa, where he began to play the pirate. The struggle between the kings of Aragon and the French kings of Naples for the possession of Sicily was at this time going on; and Roger entered the service of Frederick, king of Sicily, who gave him the rank of vice-admiral. At the close of the war, in 1302, Frederick being anxious to free the island from the auxiliaries whom he had no longer the means of paying, Roger induced his followers to seek new adventures in the East, in fighting against the Turks, who were ravaging the empire. The emperor Andronicus II. accepted his offer of service; and in September, 1303, Roger with his fleet and army arrived at Constantinople. He was adopted into the imperial family, was married to a granddaughter of the emperor, and was made grand duke and commander-in-chief of the army and the fleet. After some weeks lost in dissipation, intrigues, and bloody quarrels, Roger and his men were sent into Asia, and after some successful encounters with the Turks they went into winter quarters at Cyzicus. In May, 1304, they again took the field, and rendered the important service of relieving Philadelphia, then invested and reduced to extremities by the Turks. But Roger, bent on advancing his own interests rather than those of the emperor, determined to found in the East a principality for himself. He sent his treasures to Magnesia, but the people slew his Catalans and seized the treasures. He then formed the siege of the town, but his attacks were repulsed, and he was compelled to raise the siege. Passing over into Europe, he settled his troops in Gallipoli and other towns, and visited Constantinople to demand pay for the Grand Company. Dissatisfied with the small sum granted by the emperor, he plundered the country and carried on intrigues both with and against the emperor. In the spring of 1306 Roger was created Cæsar, this being the first time that the title was given to a mere adventurer. Before setting out on a second expedition to Philadelphia, he visited the young emperor Michael at Adrianople; and there he was assassinated and his Catalan cavalry were massacred, April 4, 1306. His death was avenged by a war which was fiercely waged by the Grand Company against the Greeks.

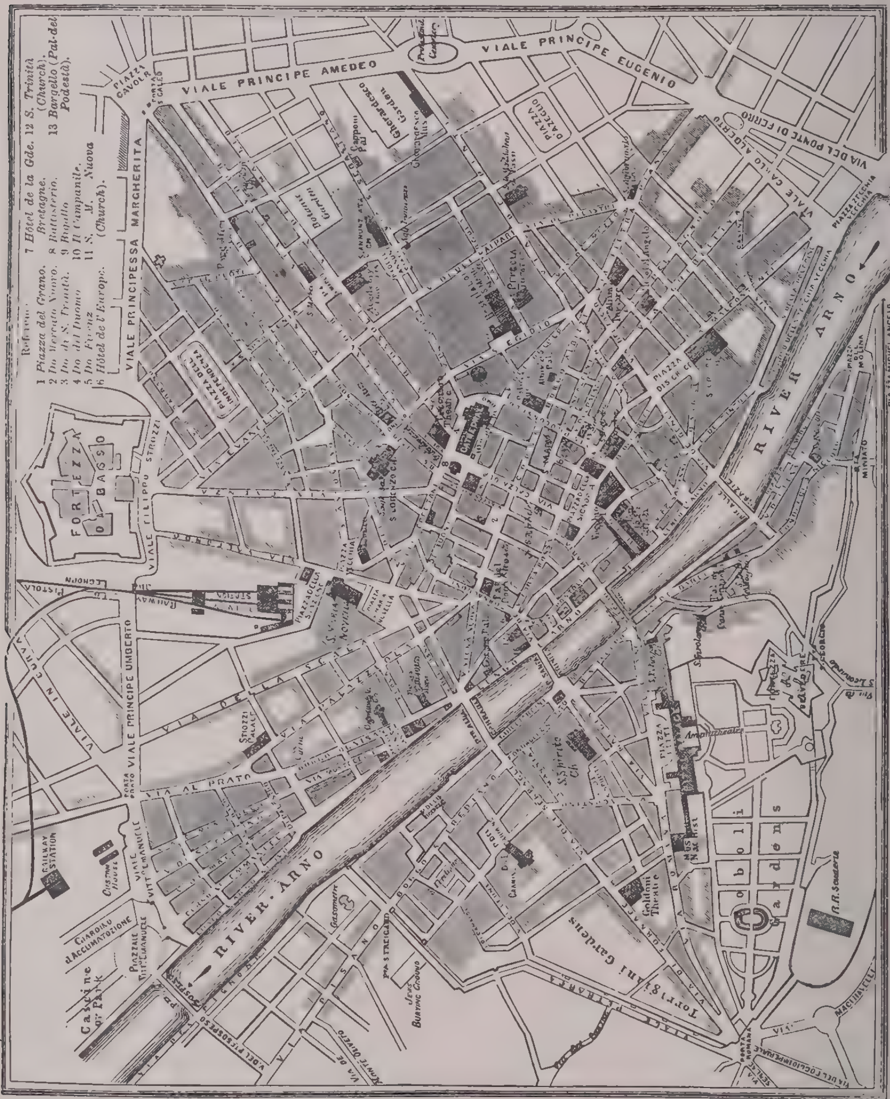
FLORA, in Roman mythology, a goddess of spring-time and flowers, to whom for her fostering influence a festival (*Floralia*) of great gayety and perhaps excessive license was held in Rome, at first irregularly, but after 173 B.C. annually, with increasing popularity. This festival was extended to five days, April 28 to May 3, the date of April 28 answering to the foundation day of the temple of Flora near the Circus Maximus. To her worship was attached a Flamen Floralis.

FLORENCE (Italian *Firenze*, ancient *Florentia*), the capital of Tuscany, now a province of the kingdom of Italy, is an archiepiscopal see. It is situated 125 miles north of Rome, 43° 50′ N. lat., 11° 14 E. long., on both sides of the river Arno, which here flows through a wide valley, bounded by spurs of the Apennine range to the north, and by lower hills to the south of the city. The bed of the river at Florence is 138 feet above the Mediterranean. The geological formation of the surrounding country is Upper Cretaceous and Older Tertiary, partly covered by the fossiliferous upper Arno beds of Newer Tertiary, containing elephant bones. Pietra forte, belonging to the Cretaceous, a durable sandstone with calcareous ingredients, is largely quarried south of Florence, and has been used for centuries as paving-stones for the city, as well as in the construction of the city walls, the palazzi, churches, etc. North of Florence, pietra serena or macigno, a pure sandstone belonging to the Tertiary beds, is likewise worked for building purposes; its texture being finer than that of the pietra forte, it has been adopted for the interior of churches and houses.

The soil is remarkably fertile: corn, vines, and olives cover hill and valley, while the mountains, which rise above 3000 feet, have the cypress, ilex, chestnut, and pine. The country is celebrated for the abundance of its flowers. and presents a rich field for the botanist.

Climate and Sanitary Condition.—The climate of Florence is extremely variable, especially in the early spring, when the inhabitants are liable to diseases of the trachea, to bronchitis, and affections of the lungs. The summers are hot; but both the summers and autumns are peculiarly healthy, when the city is entirely free from intermittent fever, while typhoid fever is of rare occurrence. Eruptive diseases and all children's complaints are exceedingly mild. Diphtheria appeared first in 1868, and continued as a severe epidemic until 1872, since which time it has only occurred at intervals and in isolated cases. Cholera has more than once visited Florence with severity, but the last time it was in Italy this city escaped the calamity. The migliaria, so much dreaded by the Florentines, is not confined to Italy, but here, as elsewhere, is found to be an accompaniment of typhoid fever, pneumonia, and some other diseases. The average temperature throughout the year is about 15° centigrade (59° Fahr.). The greatest summer heat averages 36° centigrade (96·8° Fahr.), but it has risen exceptionally to 39° centigrade (102·2° Fahr.). The greatest cold is about 6° centigrade below zero (21·2° Fahr.). The longest day is 15 hours 23 minutes; the shortest, 8 hours 50 minutes. The average annual rainfall is about 9 inches. The drainage of the city is imperfect, and it is ill supplied with water, which is largely impregnated with carbonate of lime. The wells are shallow, not above 20 or 22 feet deep. The best drinking water is conveyed in pipes from a distance of seven miles north of Florence to the Palazzo Pitti. The water of the Arno above the town has latterly been filtered and pumped up to a reservoir for distribution in the city.

Public Buildings, Parks, and Charitable Foundations.—Florence contains more than 170 churches, several of which are Italian Evangelical, besides English, American, French, and German Protestant, and a large Jewish synagogue lately erected. The most remarkable are the Badia or ancient abbey, the cathedral with its campanile, and the baptistery, Sta. Maria Novella, San Marco, the SS. Annunziata, and Or San Michele, with San Miniato and San Francesco beyond the walls. Of the palaces, whose construction of rough hewn stone gives a peculiar character to the city, those of greatest interest are the royal residence of the Pitti, the Palazzo Vecchio or municipal palace, and the Palazzo Riccardi, once the mansion of the Medici, but now the palace of the prefect. To these may be added the private palaces of the Strozzi, Rucellai, Corsini, Corsi, Quaratesi, Gondi, Albizzi, and Alessandri. The streets of modern Florence bear the names of many illustrious citizens of the past, and in the older narrower streets which have been left standing, the former homes of Dante, Macchiavelli, Guicciardini, etc., have tablets with their names inscribed. Some of the tabernacles, or frames containing pictures of sacred subjects, with lamps burning before them, still remain, commemorating the ancient usage of praying in the corners of the streets. The walls of Florence north of the Arno have been demolished, leaving the gates isolated, huge monuments of the past. South of the Arno the four gates of Romana, San Frediano, San Giorgio, and San Nicolo, remain as of old.



Plan of Florence.

The city is intersected from S.E. to N.W. by the river, which is crossed by six bridges. Two are suspension bridges, the remaining four of stone. The Ponte Vecchio, or jeweller's bridge, alone retains its ancient form, and is still flanked on both sides by goldsmiths' shops; the bridge of the S. Trinità is adorned with statues, and is remarkable for the perfect symmetry of the arches. The fortresses of Belvedere and Del Basso are now only used as barracks for soldiers. Since the annexation of Tuscany to the Italian kingdom the convents in Florence have been suppressed. A few monks are allowed to remain in each sanctuary, but the Government has prohibited any new monks or nuns to be added to the present number. This prohibition is, however, constantly evaded, and some of the schools for the young continue in their hands. There are twelve hospitals, including those for the blind, deaf and dumb, and insane.

The hospital for the sick of Sta. Maria Nuova was founded by Folco Portinari, the father of Dante's Beatrice, and the institute for the relief of the poveri vergognosi, or those ashamed to beg, by the good bishop Antonino, in the 15th century. One of the most important and beneficial charities is that of the Misericordia, or brothers of mercy. Florentines of all ranks belong to the society, and the members are equally bound to lend their services without remuneration when summoned, either to convey sick or wounded persons to the hospital, to nurse them in their homes, or to carry the dead to burial. Next in antiquity is the Bigallo for the reception of orphans or children abandoned by their parents, as well as the Innocenti or Foundling Hospital. The most admirably conducted modern charity is the workhouse or Pia Casa di Lavoro of Monte Domini. The building comprises two former convents; the Pia Casa is self-supporting, and independent of the municipality. None are admitted who are able-bodied, or who have relations capable of supporting them. An excellent education is provided for the boys, who are taught a trade by being bound apprentices to one of the workshops attached to the establishment. The girls are provided with dowries when they leave the Pia Casa.

There are nine theatres, and several public parks or gardens. The Cascine, a large extent of ground surrounding a fancy farm formerly belonging to the grand dukes, and planted in long avenues of ilex and other trees, is the fashionable resort of the Florentine nobility. The Strada dei Colli, outside the Porta Romana, winds round the hills of Arcetri and San Miniato, affording a magnificent prospect over Florence. The Boboli garden, behind the Pitti, and belonging to the royal palace, is open twice a week to the public, and, with its trim alleys, quaint terraces, statues, and fountains, is the delight of the Florentines.

Galleries of Art and Libraries.—Besides some excellent private collections, such as those of the Torrigiani, Corsini, and Strozzi, the Uffizi contains a very fine gallery of paintings, especially of the Tuscan school, but including several of Raphael's and Titian's masterpieces. The greatest treasures of the gallery are contained in one room called the Tribune, where are also placed the most celebrated statues of antiquity. A suite of small rooms contains some admirable specimens of other schools of painting. In one of the larger rooms is the famous group of the Niobe; two others are filled with portraits of artists, chiefly by their own hands; and there are, besides, valuable collections of busts, coins, medals, gems, engravings, and drawings by the old masters. The Pitti collection of paintings is perhaps the finest in the world, not only from the *chefs d'œuvre* of the great masters, but from the small number of pictures which may be considered of even mediocre merit. The Academy is assigned for the best examples of early art down to the time of Fra Angelico and Perugino; and connected with it are the cloisters of the former convent of the Scalzo or barefooted friars, where are some of the finest works of Andrea del Sarto in chiaroscuro. The Egyptian museum in the Via Faenza is small, but contains several objects of interest, and the museum of Etruscan art under the same roof is peculiarly important from a life-size bronze statue, a marble Greek sarcophagus with a colored representation of the battles between the Greeks and Amazons, and a terra-cotta statue of a lady in the costume of the third century before Christ. Here also is an interesting fresco of the Last Supper attributed to Raphael, whilst the Convent de' Pazzi possesses the finest work of his master Perugino, a Crucifixion, now open to the public.

There are three large and valuable libraries in the city: the National library, which unites the former library of the Pitti with the Magliabecchian, the two together containing 280,000 volumes; the Marucelliana, chiefly remarkable for important works on art; and the Laurentian, founded by Lorenzo de' Medici, and attached to the convent of San Lorenzo. This last is rich in a collection of more than 9000 valuable manuscripts, as well as illuminated Bibles and missals, and possesses about 20,000 volumes of print. The pride of the collection is an original and perhaps unique copy of the Pandects of Justinian.

University and Schools.—The university of Florence, which is rather an institute for advanced studies,—Istituti de' Studi Superiori Pratici e di Perfezionamento,—has its origin as far back as the year 1348. It was divided into six "scholæ," viz., theology, jurisprudence, medicines, belles lettres, Greek and Latin literature, and astrology or astronomy. To counteract the effects of the plague, which in the year just mentioned had decimated Florence and caused the city to be avoided by strangers, it was decreed that no one living within the walls, or even in the territory of the republic, should be allowed to seek an education abroad, and that those youths who were already attending other lyceums should forthwith return to their native city. In 1421 there were already 42 professors, and although in 1472 the Medici desired to revive the splendor of the Pisan university, and transferred several of the chairs from the city to Pisa, Florence retained many distinguished professors. The university underwent various changes, both in organization and name, but continued to flourish under the Medicean grand dukes. It gave rise to several academies, the most ancient of which was the Platonic, founded by Marsilio Ficino, for the cultivation of Greek literature, the Florentine academy, and the Accademia del Cimento (discussion) which had its rise with Galileo and his scholars. The Accademia della Crusca—named from *crusca* (bran) to express sifting the language—was founded in 1552, and the agricultural academy of the Georgofili in 1783. The taste for botany of Cosimo I. led to the formation of a herbal garden (Giardino de' Semplici)—and ultimately to the botanic garden under the walls of the Boboli. Natural science first formed a branch of study under the patronage of the Medici, who invited foreigners of scientific distinction to Florence. A vast collection of objects of natural science and physics having accumulated, the celebrated professor Giovanni Targioni Tozzetti, in the 18th century, threw them open to the public. The observatory, once attached to the museum, has been removed to a height corresponding with that on which Galileo made his observations. The collection in the museum was enriched by the valuable waxen anatomical preparations of Giulio Zummo of Syracuse, and by a unique collection of physical instruments most of which had belonged to the Accademia di Cimento. The university was reorganized in 1859, when Baron Ricasoli presided over Tuscany. Several new professorships were founded, in law, philosophy, and philology. In 1869 a chair of anthropology was added. The medical school of Sta. Maria Nuova has also been attached to the university. At one time the students of law, medicine, and natural science were expected to pursue their studies, first in Pisa, and the last two years in Florence, where they received their degrees. This has again been modified, and students in Florence have now the option of receiving degrees in Florence, Siena, or Pisa. Natural science degrees are conferred at the Specula, or institute of natural science, in the Via Romana.

The communal or municipal schools, where the pupils are admitted gratis, have increased enormously. From 4 schools under the last grand-duke, there are now, besides 32 elementary schools, 15 lyceums, of which three are for girls, and one of these a normal school for the training of teachers. The entire number of pupils in the schools averages 7900.

The *manufactures* are few and of small importance, that of silk standing first. The cultivation of the silk-worm and straw plaiting are the usual occupations of the people. The porcelain manufacture of the Marchese Ginori at Doccia, a few miles from Florence, has greatly fallen off in work as well as reputation; but a successful attempt to revive majolica ware has recently been made by Signor Cantigalli, whose manufactory is beyond the Porta Romana.

Administration.—Florence is governed by a prefect or representative of the chief government, who has a force of carabineers (mounted police) at his disposal, besides guardie di sicurezza, partly paid by the muncipality although there is also a city police. The ancient office of gonfalonier is replaced by that of syndic, who is president of the junta or municipal council. The city is divided into four electoral districts, and sends four deputies to parliament. Every male inhabitant above twenty-five years of age has the right of suffrage, although twenty-one is the usual age qualifying for official posts in Italy.

Population.—The population of Florence is very fluctuating. In 1854 the inhabitants numbered 115,675, but during the short period when it was the capital of the new kingdom there was a large increase of Italians as well as foreigners; this diminished as rapidly on the transference of the capital to Rome. By the census taken December 31, 1871, the total population, foreigners included, amounted to 167,093. On December 23, 1876, the number had risen to 176,121. In 1871 there were 158,704 Italian Roman Catholics, 917 Italian Protestants, 2366 Jews, and 5106 of other sects.

The Florentines are gentle and courteous in their manners, though retaining the republican feeling of equality, and are well disposed towards all who treat them with kindness and respect. They are justly proud of the traditions of their native city, but are hardly conscious that centuries of misgovernment have left them behind in the race of civilization. Though the advantages of a liberal education are now open to them, and they are remarkably rapid in acquisition, the more important moral training is still wanting,—a defect which, with the absence of chivalrous respect for women, renders men of all classes, as is too much the case also in other parts of Italy, tyrannical to their wives and children, as well as indifferent to the sufferings of the lower animals, all alike being regarded as property, over which they have an absolute control. From their nervous physical organization the Florentines are defective in manly courage, but peculiarly sensitive to the beautiful in art, and able to reproduce all that is delicate and refined in decoration. As, however, with the decline of the healthy vigor and simple lives of their ancestors they have lost much of their originality, modern sculpture and painting are in general feeble, and wanting in truth of expression and color. Though indolent and incapable of great exertion, the lower orders are industrious, and though impetuous, they have displayed exemplary patience and moderation in times of adversity. Their greatest misfortunes are the passion for gambling, with other vices remaining from a corrupt state of society, and the extremes of superstition and scepticism, which belong to the state of transition, political and religious, of the present era in Italy (1878). The large middle class, however, besides producing men eminent in literature and science, is rising in social and political importance, and by their intelligence and domestic virtues may well redeem faults in their fellow citizens, which are to be regarded rather as the result of adverse circumstances, than as a constant factor in the character of the Florentine people.

History.—Florence was originally a small trading village belonging to the Etruscan city of Fiesole, whence merchandise was sent down the Arno to Pisa, then a seaport. When colonized by the soldiers of Sulla, it gradually attained the dignity of a city, with the rank and privileges of a municipium. The name Florentia may have been derived from Florinus, a Roman general, or from Fluentia, because situated at the confluence of the Arno and Mugnone, or from the profusion of flowers growing in the vicinity. In the reign of Tiberius Cæsar the Florentines sent an embassy to Rome to deprecate a decree of the Roman senate, by which, in order to check the inundations caused by the number of tributary streams flowing into the Tiber, it had been proposed to turn the Chiano into the Arno. Christianity was first introduced in 313 A.D., and the most celebrated of early Florentine bishops was Zanobius, who died in 417, and to whom various miracles are ascribed. During his lifetime an invading army of barbarians approached Florence, but were defeated and destroyed in the fastnesses near Fiesole by the Roman general Stilicho. The Florentines, however, attributed the preservation of their city to the prayers of Zanobius. The victory was won in 405 on the 8th October, a day dedicated to a youthful saint, Reparata, who is said to have appeared in the midst of the battle, bearing in her hand a blood-red banner with the device of the white lily, which from that time became the badge of the city, whilst a new cathedral, built on the site of the old church of San Salvador, received her name. Florence had suffered the fate of other Italian cities at the hands of northern invaders, when Charlemagne, on his way to Rome, rebuilt its walls. Commerce began to flourish in the 10th century, when as yet German nobles or their descendants, who held their castles in fief of the German emperors, dwelt beyond the city. The pope, because an Italian sovereign, was regarded as the representative of national independence, and when Tuscany fell to the inheritance of the Countess Matilda, the Florentines found in her a patriotic champion of their rights, as well as a staunch adherent of the reigning pope, Gregory VII. A second circle of walls was built as a protection against the imperialists, and Matilda obliged some of the powerful nobles in the neighborhood to yield their lands to the canons of Sta. Reparata. She died in 1115, leaving a name so beloved by the Florentines that their female children were frequently christened Contessa, or Tessa, in remembrance of their benefactress. As the Florentines conquered and destroyed the castles of the robber chieftains who infested their neighborhood, they obliged them to reside within their city—an impolitic measure, which sowed the seeds of future discord and civic war. The romantic story of the Buondelmonti, whose assassination in 1215, for a breach of promise of marriage, occasioned a fierce outbreak of strife, is an instance of the many feuds that caused bloodshed in Florence during centuries.

About 1240 the Paterini, a sect of Reformers, after the manner of the Albigenses in France, had gained considerably in numbers and influence, especially among the imperialists, who about this time assumed the name of Ghibellines. Their adversaries, the Guelphic or papal party, called in Peter Martyr, a Dominican friar of Verona, to rouse the multitude for the destruction of this heresy. Two columns in Florence still mark the spots where the Paterini were massacred. A few years later the Guelphic Florentines sustained a severe defeat from Manfred, a natural son of the emperor Frederick II., at Monteaperti near Siena; and the Ghibellines, whom they had banished, re-entered Florence. The Ghibelline conquerors proposed to level the city with the ground, but were deterred by the bold and determined opposition of one of their own party, Farinata degli Uberti, whose name has been immortalized by Dante. About this time a French pope, Clement IV., invited Charles of Anjou, brother of Louis IX. of France, to take possession of Naples and drive the imperialists from Italy; and after the defeat and death of Manfred at Benevento, Charles complied with the request of the Florentine Guelphs, to assume the lordship of their city. In 1282, however, the wealthier guilds of Florence established a form of government or signory of their own, consisting of members chosen among themselves with the title of priors. Not satisfied with having driven their Ghibelline rivals into banishment, they sent an army to encounter them at Campaldino, where the Ghibellines were defeated with great slaughter. To arrest the power of the nobles within the city, a new code was framed in 1293, which went so far as to exclude them from their rights as citizens, and an officer was appointed—gonfaloniere di giustizia (standard-bearer of justice)—with a guard of soldiers to enforce the laws. Seventy-two families were declared incapable of holding office, and as they naturally combined in self-defence, peace seemed as far removed as ever from the walls of Florence.

The 13th century is one of the most important in the annals of the city. When Boniface VIII. held his jubilee in 1300, twelve of the ambassadors representing foreign powers were Florentines. So vast were the riches of Florence at this period, that when a citizen of Verona beheld the yet unfinished campanile, and exclaimed that the wealth of two monarchies would not suffice for such a monument, he was shown the public treasury to convince him that were the Florentines so inclined they could build their whole city of marble. The most illustrious of Florentine citizens, as well as poets, Dante Alighieri, born in 1265, was present at the battle of Campaldino in 1289, and was chosen prior of the republic in 1300. In his immortal poem, the *Divina Commedia*, he has preserved the names and deeds of the great men who made Florence renowned by their works. The friend of Dante, Guido Cavalcante, was considered no mean poet, and among the historians or chroniclers Dino Compagni and Giovanni Villani have left faithful records of their age. Cimabue commenced a new era in painting, and his pupil Giotto carried the art still further. Pre-eminent also in sculpture and architecture, in which Nicolo Pisano had led the way by his study of Greek art, Giotti built the beautiful campanile of the cathedral. St. Croce, founded in 1297, and the new cathedral of St. Maria del Fiore, were the work of the celebrated architect Arnolfo di Cambio. The exquisite church of Sta. Maria Novella was also begun in this century. The bridge of Rubaconte or Delle Grazie, and that of Carraia, were added to the Ponte Vecchio, and thus the two sides of the river were connected by three thoroughfares, although before the 13th century there had been no houses of importance south of the Arno.

With the commencement of the 14th century the parties which contended for power in Florence had assumed new names. On one side were the Bianchi, including the remnant of the old Ghibelline faction, but now representing the popular party; on the other, the Neri or Guelphs, who, under their leader, Corso Donati, represented the nobles or aristocracy of the city. Each party as it gained the ascendency sent its opponents into exile, until Pope Boniface VIII. again resorted to the fatal expedient of sending for a French prince, Charles of Valois, to restore order, and establish papal supremacy in the peninsula. When Charles arrived in Florence, he gave full license to the Neri to pillage the city, and avenge their wrongs. The signory endeavored to conciliate him by bribes, a measure to which Dante, then a prior, refused his consent, thus leading to his own banishment. A few years later the emperor Henry of Luxembourg descended into Italy, and the Florentines, whilst boldly preparing to resist his pretensions, added a third circuit of walls to their city. His death in 1313 put an end to this danger.

In a war with Castruccio Castracani, the tyrant of Lucca and Pisa, the Florentines sought the assistance of Robert, king of Naples, the son of Charles of Valois; but soon becoming jealous of the foreign power they had themselves invited, they created a new officer of justice, called the Bargello or head of police, who exercised his authority with so much cruelty that for a few months Florence was subjected to a reign of terror. During another war with Lucca, the Florentines again applied to Robert of Naples, who sent them his son, the duke of Calabria. He was accompanied by Walter de Brienne, duke of Athens, who, acting as lieutenant for the young prince, set aside the government of the priors, and ruled Florence with a rod of iron. The people could not long endure his acts of savage cruelty, and drove him from their city, after having put his minions to death in a manner so barbarous as to rival the deeds of the tyrant they had expelled. Tumults, a famine, and lastly the plague, devastated the land; and as a culmination of disasters, the mercenary troops employed everywhere in Italy roamed over the country and spread desolation wherever they came.

In 1378 occurred the famous rebellion of the Ciompi (Wooden Shoes), in which the artisans of Florence, led by a wool-carder, Michele di Lando, gained possession of the Palazzo Vecchio, and turned out the signory. Lando proved himself a man of sense and courage; he finally quelled the riot in which he had been engaged but had not roused, and restored the authority of the government. It was about this period that Salvestro de' Medici, Bettino Ricasoli, and Gino Capponi were among the leading men of the republic. From the riot of the Ciompi to the year 1390 Florence enjoyed the rare blessing of peace. This was broken by the ambitious thirst for universal dominion of Gian Galeazzo Visconti, lord of Milan, and Florence owed her preservation to her general, Sir John Hawkwood, an Essex tailor, who had joined the mercenary bands on the Continent, and earned himself wealth and celebrity as one of the greatest commanders of the age. The death of Gian Galeazzo in 1402 terminated the war. In 1406 the Florentines gained possession of their ancient rival Pisa after a long and cruel siege. The fall of Pisa put an end to the power of the Ghibelline or feudal party in Tuscany. In 1414, at the council of Constance, Pope John XXIII. was deposed, and came to reside in Florence, where his monument in the baptistery is one of the finest works of Donatello.

The wealth of the city was meantime always increasing, and manufactures of silk and woollen articles flourished within her walls. The richest of her citizens, Giovanni de' Medici, was chosen gonfalonier in 1426, but the popularity of this family had begun to excite the apprehension of all true patriots. When Giovanni introduced the "catasta," or inquiry into the possessions of every citizen, with a view to taxation according to their means—a measure favorably viewed by the lower orders,—it raised loud opposition on the part of the wealthy; for, however great their riches, none could compete with the Medici, and they saw in the "catasta" another stepping stone to raise their rival to greater power and authority. At Giovanni's death his popularity descended to his eldest son Cosimo, who lived to be called (however undeservedly) the father of his country. From him descended Lorenzo the Magnificent, Popes Leo X. and Clement VII., Catharine de' Medici queen of Henry II. of France, and Alexander, the first duke of Florence. From Giovanni's younger son Lorenzo descended the grand-dukes from Cosimo I. to Gian Gastone. Cosimo de' Medici and Rinaldo dei Albizzi represented the two great families who aspired to rule Florence. The Albizzi for a short time gained the ascendency, and Cosimo was sent into exile. Before a year he was recalled, and was created ganfalonier, and the Albizzi were banished.

In 1441 an œcumenical council was held in Florence by Pope Eugenius IV., to settle the claims of the Latin and Greek Churches, when learned men arrived from the East, and introduced the study of Greek classical authors. Neri Capponi alone ventured to oppose the ambition of the Medici, and it was said of him that, if Cosimo was the wealthiest man, Neri was the wisest in Florence; but the death of Capponi in 1457 left the Medici without a rival. The death of Cosimo's favorite son Giovanni in 1463 cast a gloom over the few remaining months of his own life, for his surviving son Pietro was a man enfeebled by disease. At the death of Pietro in 1469, his young son Lorenzo relates how the principal men of the city and of the state came to their house to condole with them on their loss, and to encourage him to take on himself the care of the city and government, as his grandfather and father had done. In 1470 Lorenzo was created syndic, and the next year he entertained with the utmost magnificence Galeazzo Sforza, duke of Milan. In 1472 Volterra was added to the Florentine dominions. Such horrible atrocities were committed during the siege and sack of this city, that the crime lay heavy on Lorenzo's conscience in his dying hour. In the Pazzi conspiracy of 1478 Lorenzo narrowly escaped with his life, whilst his brother Giovanni was murdered before the altar of the cathedral. The conspirators were put to death with great barbarity, and Lorenzo's popularity rose higher than ever. Surrounded by men of genius and learning whom his wealth could buy, or the charms of his manners and accomplishments could attract, Lorenzo added to the honors of his native city by reviving Greek taste and culture.

The appearance of Girolamo Savonarola, or the "Frate," as he was called in Florence, awoke a new spirit. His denunciation of the immoral lives of the citizens, and of books and works of art which tended to lower rather than exalt human nature, including the writings of Lorenzo himself, were listened to by crowded audiences. Such was his influence that even Lorenzo, when on his death-bed in 1492, sent for the "Frate" to receive his confession, and grant him absolution. That absolution Savonarola refused, unless Lorenzo repented of his usurpations, and promised to restore a free government to Florence; but to this Lorenzo would not consent, and he died unshriven. The dawn of art and literature in the 13th century had attained its greatest brilliancy in the 14th and 15th. Before the Medici had risen to power, the city had been embellished by the works of Andrea Orcagna, Taddeo Gaddi, Fra Filippo Lippi, Fra Angelico, Andrea Castagno, Donatello, and Desiderio di Settignano; Ghiberti had designed his Gates of Paradise for the baptistery; Brunelleschi had added a cupola to the cathedral; and Maso Finiguerra had led by his niello work to the discovery of copperplate engraving. It was in the 15th century that Bernardo Cennini introduced the art of printing into Florence. Filippino Lippi, Fra Bartolommeo and his friend Mariotto Albertinelli, Baccio d'Agnolo, Baldovinetti, Sandro Botticelli, the Ghirlandai, the Peselli, Benedetto da Rovezzano and Benedetto da Majano, Mino da Fiesole, Andrea Verocchio, and Leonardo da Vinci were the precursors, and some of them the contemporaries, of Michelangelo, the glory of his fellow citizens. With Andrea del Sarto and Raphael—who, though from Urbino, painted some of his finest works in Florence—painting reached its highest perfection. Among the men of literature were Boccaccio, Guicciardini, Macchiavelli, Poliziano, Marsilio Ficino, and Pico della Mirandola. Lorenzo's eldest son Piero succeeded to his honors; his second son Giovanni, already a cardinal, became afterwards Leo X., and his youngest son Giuliano, duke of Nemours, perhaps the only virtuous man among the Medici, died young.

When Charles VIII. of France was invited by Lodovico il Moro, lord of Milan, into Italy, Piero de' Medici, to conciliate the goodwill of the French king, visited him in his camp, and offered to yield the fortresses of Tuscany into his hands. On Piero's return to Florence he found himself condemned as a traitor, and had to escape from the city, followed by the rest of his family. Charles VIII. entered Florence in 1494, intending to restore the Medici, but the signory refused to comply with his request, and when the king, affecting to play the part of a conqueror in a vanquished city, dictated terms which he expected the Florentines to accept, Piero Capponi, one of that family of staunch republicans, tore the obnoxious paper in his presence. Charles angrily declared he would summon his troops by the call of the trumpet. "And we," replied Capponi, "will sound our bells"—the old war signal of the Florentines. Charles was forced to yield, but still lingered in Florence, until Savonarola, whose courage and sacred character appear to have overawed even this proud monarch, went to him and bade him begone. The influence of the "Frate" daily increased as well as the number of his followers; and eager to restore a free constitution to Florence, which he believed could only exist with virtue in her citizens, he persuaded the signory to call a grand council or parliament of the people. Charles VIII. had restored independence to Pisa, but the Florentines were eager to recover possession of that city, and since Pisa was the ally of Pope Alexander VI., the Borgia of infamous memory, and the greatest enemy of Savonarola, the "Frate" sanctioned the act. Piero Capponi perished during the course of this short war, and the Medici made a fresh attempt to re-enter Florence. The tide of popular favor was turning against Savonarola; step by step he lost ground with the people, till after a violent tumultuary attack on his convent of St. Mark in 1498, he was dragged to prison, torture, and execution.

Early in the 16th century Louis XII. of France having entered Italy to claim the duchy of Milan, by right of his grandmother Valentina, a Milanese princess, Pope Julius II., who had placed himself at the head of the league to drive him from the country, insisted on the Florentines joining the enemies of the French king and recalling the Medici. Piero had met his death by accidental drowning, but his son Lorenzo, duke of Urbino, returned to Florence, and after a short life of vicious indulgence, died in 1519, leaving an infant daughter, Catharine, afterwards married to Henry II. of France. Two illegitimate scions of the family, Ippolito and Alexander, now occupied the Medici palace in Florence. Clement VII., also a Medici, who had succeeded Pope Julius, was at this time besieged in his castle of St. Angelo by the Constable Bourbon, general of the emperor Charles V.; and in the year 1527 Rome was taken and sacked, to the consternation of all Europe, whilst the party in Florence hostile to the Medici alone perceived a gleam of hope in the destruction of a Medicean pope. Niccolo Capponi, a weak though amiable man, was the leader of this party, and Clarice, the sister of Lorenzo of Urbino and wife of Filippo Strozzi, one of the most unprincipled of Florentine citizens, appealed to Niccolo for aid to drive out of Florence the two youths Ippolito and Alexander, whom she refused to accept as belonging to her family. Meantime Clement had been reconciled to the emperor, and both approached Florence with a large army. After enduring all the protracted sufferings of a siege, and after the gallant but vain attempts of the patriot Feruccio to relieve his fellow citizens, Florence fell by treachery into the hands of the enemy; the Medici entered the city in triumph, and Alexander was created its duke (1530). Ippolito died by poison, administered, it is supposed, by his cousin Alexander, who, after a reign rendered detestable by his vices, was murdered in his bed by his cousin Lorenzino, in 1537. Cosimo de' Medici, son of Giovanni delle Bande Nere, a brave soldier and captain of mercenary troops, and descended from Lorenzo the brother of Cosimo the "father of his country," succeeded to the dukedom. The conquest of Siena added to his wealth and power; and in 1569 the pope created him grand-duke of Tuscany. Though accused of the murder of two of his sons and of a daughter, Cosimo had the force of character and ability to command fear, if not respect, from the people over whom he tyrannized. He was a patron of art, and this hereditary taste was continued in his son the grand-duke Francis I. (1575).

The school of art founded by Michelangelo had degenerated into feeble exaggerations, without the genius of the great master. Giovanni Bologna and Benvenuto Cellini alone struck out new and original paths; and the elegance and grace of their works in bronze and marble still adorn the public places of Florence, eclipsing the clumsy productions of their contemporaries. Francis was married first to Johanna of Austria, and secondly to a beautiful Venetian lady, Bianca Capello, whose first husband was assassinated to make way for the grand duke. Francis and Bianca died on the same day, 1587, not without suspicion of having been poisoned by his brother and successor Ferdinand, who resigned a cardinal's hat for the dukedom, and married Princess Christina of Lorraine. A double alliance was formed with France by the union in marriage of his niece Maria de' Medici, daughter of Francis, with King Henry IV. Cosimo II. succeeded Ferdinand in 1609. The day of his accession Galileo Galilei discovered the satellites of Jupiter, which, in compliment to the young sovereign, he named "Stelle Medicei." See GALILEO.

Ferdinand II. was still a child when he ascended the throne in 1621. He married Vittoria della Rovere, heiress of Urbino; and though her lands were claimed by the church, she brought a rich dowry to Florence. Ferdinand and his brother Cardinal Leopold added greatly to the art treasures in the galleries, and founded academies of art and science. Cosimo III., who succeeded in 1670, was a narrow-minded bigot, whose marriage with a gay young princess of the court of Louis XIV. of France ended in separation. He died in 1713, leaving one son, Gian Gastone, whose mild character, aversion to the punishment of death, and abolition of oppressive taxes made him popular with his subjects. Commerce, industry, and agriculture flourished during the reign of this last of the Medici. At his death in 1737 he left no male heirs to the throne. Tuscany had been already assigned by a European agreement —the celebrated Pragmatic Sanction—to Francis duke of Lorraine in compensation for his duchy, which had been annexed to France. In 1753 an edict gave Tuscany to the second son of Francis and the empress Maria Theresa; and two years later, on the death of his father, Pietro Leopoldo of Austria arrived in Florence to take possession of the throne. His short reign marked a new era of progress and reform. The Inquisition was abolished, privileges set aside, and plans proposed for draining and colonizing the Maremma. In 1790 Leopold was called to Vienna to succeed his brother Joseph II. as emperor, and left his younger son Ferdinand III. grand-duke of Tuscany. By an article of the Pragmatic Sanction, Tuscany had been declared a separate and independent sovereignty; therefore, when, after the outburst of the French Revolution, the emperor Francis II. claimed the assistance of a Tuscan army to restore the Bourbons in France, the great minister Fossombroni refused, declaring that Tuscany was on terms of peace and amity with the French republic. But in 1796 Ferdinand, yielding to the importunity of the court at Vienna, joined in the war against France, and two years later Florence was occupied by a French army. The first consul, Napoleon Bonaparte, conquered Tuscany, and whilst Ferdinand renounced his rights on condition of a compensation in Germany, one of the Bourbons of Parma was placed on his throne as king of Etruria. Tuscany was annexed to the French empire in 1808, but in 1809 the grand-duchy was restored in favor of Eliza Bonaparte Bacciochi, sister of the emperor Napoleon.

Her reign lasted only five years, and after Napoleon had been exiled to Elba, Ferdinand resumed his sovereignity. On this occasion an Austrian, Prince Rospigliosi, was sent to Florence to announce his arrival, and in his proclamation he declared Tuscany to be an inheritance and patrimony of the imperial house of Austria. The vain attempt of Lombardy in 1820 to shake off the Austrian yoke, an attempt in which the crown prince of Piedmont, Carlo Alberto, was secretly implicated, ended in the incarceration of some of the noblest Italian patriots in Austrian fortresses for a period of from 16 to 20 years. It was vain for Fossombroni to protest, and declare that the Tuscan government did not require Austrian soldiers to play the masters; Austrian soldiers arrived to occupy Tuscany as well as the other Italian states, and the aulic counsellor Menz wrote to Prince Metternich that "the Tuscan Government, led to reflect on its dangers, had assumed a firmer attitude, and constituted a more active and vigilant police, and, at all events, the respect inspired by Austrian bayonets placed at the gates of Tuscany were sufficient to dispel revolutionary ideas." Ferdinand died in 1833, and was succeeded by his son Leopold II., who had married a Neapolitan princess. Alarmed by the revolutionary movements of 1847, Leopold, like other Italian princes, granted his people a constitution, but when they further demanded to be led against the Austrians, to assist in driving the foreigner from Italy, he reluctantly permitted the Tuscan army, chiefly consisting of young volunteers, to depart. The enthusiastic youths who fought for the independence of their country displayed unwonted valor at Curtalone and Montanara; but the grand-duke signified his displeasure by withdrawing titles and pensions from even the surgeons who attended the wounded on the field of battle. Among the liberals in Florence who had long been seeking an opportunity to shake off foreign interference in the government of their country, were men of the greatest moderation and virtue,—Baron Bettino Ricasoli, the Marchese Cosimo Ridolfi, the poets Niccolini and Giusti, Salvagnoli, the Marchese Neri Corsini, and the Marchese Gino Capponi, the last of that family illustrious for virtue, for genius, and for patriotism.[1] The grand-duke, who either shared the principles of his family, or had not courage to place himself at the head of the distinguished men who coincided with the view of the Piedmontese minister Cavour, invited Austrian troops in 1850 again to occupy his dominions, and though Leopold affected to submit to necessity, the Austrian general declared he would not have come uninvited. This occupation lasted six years, during which time the power of life and death of Tuscan subjects was delivered into the hands of the Austrian commanders. When Victor Emmanuel, king of Piedmont and Sardinia, with the assistance of France, made war against Austria for the independence of Italy in 1859, a vain hope was still entertained that Leopold would have consented to unite his army with that of Piedmont; but the proclamation of war went forth without a sign from Tuscany. On the 27th April, 1859, the Tuscan troops unanimously declared their intention to throw down their arms unless they were allowed to join the War of Independence. The liberals insisted on the abdication of Leopold in favor of his son, and on an offensive and defensive alliance with Piedmont. Leopold declined these proposals, and quitted Florence with his family, amidst the silence of the assembled multitudes, never to return.

The following year Victor Emmanuel entered Florence, which in 1865 became the capital of his kingdom of Italy. It was not until 1870 that the hopes of the Florentines were disappointed, and the seat of government was transferred to Rome.

See the histories of the Florentine Republic by Gino Capponi, Atto Vanucci, T. A. Trollope, and Henry Napier; P. Villari's *Memoirs of Savonarola,* translated by Leonard Horner, etc. (A. S. H.)

FLORENCE, of Worcester, an English chronicler who lived during the end of the 11th and beginning of the 12th century. Nothing more is known of him than that he was a monk of Worcester, that he had a great reputation for learning, and that he died on the 5th June, 1118. His *Chronicle* begins with the creation of the world and ends with the year of his death. The earlier part is compiled from the Chronicle of Marianus Scotus, and the greater part of that which relates to English history is a translation from the Saxon Chronicle; but as he approaches his own times the independent value of his work increases, and in regard to contemporary events he is one of the most valuable of existing authorities. The Chronicle of Florence was continued from 1118 to 1141 by an anonymous writer.

An edition of the *Chronicle* was published at London in 1592, and another at Frankfort in 1601. It is also included in the *Collection of Historians,* edited by order of the Records Commission; and a translation with notes by Thos. Forester is contained in Bohn's *Antiquarian Library.*

FLORES, also called Endeh and Mangeraai, an island of the East Indian Archipelago belonging to the residency of Timor. It lies in a line with Java, between Sumbava on the west and Timor on the east, and stretches from 8° 3′ to 9° 59′ S. lat., and from 119° 49′ to 123° 1′ E. long. It is about 230 miles long, and from 20 to 40 broad, and its area is estimated at about 8900 square miles. Like most of the islands of the archipelago, it is both mountainous and volcanic, among the loftier summits being Ombuu Romba or Gunong Keo, 9054 feet in height; Lobetabi, or in a corrupted form, Lovotivo, 7115; Ombuu Soro or Gunong Rokka, 6557; and Larantuka or Ilimandiri, 5180. The interior is very partially explored, though the forests are neither so dense nor so extensive as in Borneo or Celebes. Besides amber, which is found on the coast, the mineral products consist of sulphur, pumice-stone, copper, and a little iron and gold. Sandal-wood, rice, wild cinnamon, and birds' nests are the most important articles of export, giving rise to a considerable trade with Celebes, Timor, Batavia, and Singapore. The inhabitants are mainly of Malay origin, and the language appears to be akin to that of Bima. There are considerable settlements of Buginese and Wadjorese. Portugal lays claim to certain portions of the island, but practically it is all under Dutch supremacy. Christianity has been introduced by the Portuguese on the east coast, and the converts are visited from time to time by priests from Timor.

See P. J. Veth, "Het eiland Flores," in *Tijdschrift voor Nederl. Indië,* 1855; E. Francis, *Herinneringen uit den levensloop van een Indisch ambtenaar,* 1856; S. Muller, *Bijdragen tot de Kennis van Timor.*

FLORES, the most westerly of the Azores. See Azores.

FLOREZ, Enrique (1701–1773), a Spanish historical scholar, was born at Valladolid in 1701. In his fifteenth year he entered the order of St. Augustine, professed theology at the university of Alcala, and published a *Carsus Theologiæ* in 5 vols. 4to (1732–1738). He afterwards devoted himself exclusively to historical studies. Of these, the first fruit was his *Clave Historial,* a work of the same class as the French *Art de Vérifier les Dates,* and preceding it by several years. It appeared in 1743, and passed through many editions. In 1747 was published the first volume of *La España Sagrada,* a vast compilation of local ecclesiastical history which obtained a European reputation, and of which 29 volumes appeared in the author's lifetime. It was continued after his death by Fathers Risco and Fernandez, and further additions have been made at the expense of the Spanish Government. The value of the work is considerably increased by the insertion of ancient chronicles and documents not easily accessible elsewhere. Florez was a good numismatist, and published *España Carpetana: Medallas de las Colonias,* in 2 vols. 4to (1757–1758). A third volume appeared in 1773. His last work was the *Memorias de las reynas Catolicas,* 2 vols. 4to (1770). Florez led a retired, studious, and unambitious life, and died at Madrid in May or August, 1773.

FLORIAN, the patron saint of Poland, was born at Zeiselmauer, Lower Austria, about the year 190. He served as a captain in the Roman army, and suffered death by drowning about the year 230, during the persecution of the Christians by the emperor Diocletian. His remains are said to have been buried on the site of the present Augustinian monastery at St. Florian near Linz, but were afterwards transferred to Rome. About 1183 a portion of them was presented to King Casimir of Poland, and from that time Florian became the patron saint of that country. He is represented as a warrior holding in his hand a vessel from which he pours out flames, and on this account his protection is often sought against fire. His day in the calendar is August 4.

FLORIAN, Jean Pierre Claris de (1755–1794), a French poet and romancist, was born at the château of Florian, near Sauve, in that part of Languedoc which now forms the department of Gard. His mother, a Spanish lady named Gilette de Salgues, died when he was quite a child, and the person who seemed to have had most influence on his early years was his grandfather, an old noble who had run through his estate. His uncle, the marquis of Florian, who had married a niece of Voltaire, introduced him at Ferney, and Florianet, as he was soon affectionately nicknamed, spent a pleasant time with the old dictator of French literature. In 1768 he became page in the household of the duke of Penthièvre at Anet, and throughout his life he was the object of the powerful patronage of that cultured nobleman. Having studied for some time at the artillery school at Bapaume he obtained from the duke a commission in a dragoon regiment, and in this capacity it is said he displayed a boisterous behavior as unlike as might be to what the reader of his works would naturally imagine. He afterwards left the army and became gentleman in ordinary. On the breaking out of the French Revolution he retired to Sceaux, but he was soon discovered and dragged to prison by the Parisian sans-culottes; and though his incarceration was not of long continuance, it so injured his health that he survived his release only a few months. His death took place on September 13, 1794.

Florian's first literary efforts took the shape of little comedies; but he first attracted attention by an epistle in verse entitled *Voltaire et le Serf du Mont Jura* and an eclogue called *Ruth,* which were crowned by the French

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[1] Shortly before his death in 1876, at upwards of 80 years of age, he completed his admirable history of the Florentine Republic, *Storia della Repubblica di Firenze di Gino Capponi,* 2 tom., 8vo, 1875.

Academy in 1782 and 1783 respectively. In the latter year he also produced his *Galatée*, a professed imitation of the Galatea of Cervantes, and this was followed two years later by *Numa Pompilius*, an equally undisguised imitation of Fénelon's *Télémaque*, which as an educational work has proved only less popular than its prototype. In 1788 he became a member of the French Academy, and published *Estelle*, a pastoral of the same class as *Galatée*, which is reckoned one of the best of his works. Another romance, *Gonzalve de Cordoue*, preceded by an historical notice of the Moors, appeared in 1791, and his famous collection of *Fables* in 1792. After his death there appeared an unfinished treatment of the story of William Tell, to which he had devoted the leisure of his confinement, and an abridgment of Don Quixote, which, though far from being a correct representation of the original, had great success.

Florian was a professed imitator of Gessner, and his style has all the artificial delicacy and sentimentality of the Gessnerian school. Perhaps the nearest example of the class in English literature is afforded by Wilson's *Lights and Shadows of Scottish Life*. He is least affected in his fables, his comedies, and some of his minor tales. Among the best of the fables are reckoned "the Monkey showing the Magic Lantern," "the Blind Man and the Paralytic," and "the Monkeys and the Leopard;" and *Les Deux Billets*, *Le Bon Père*, and *Le Bon Menage* are the best known of the comedies. In the latter he brought the arlequinades again into fashion, and raised them to a higher level. Florian's *Œuvres Complètes* appeared at Paris in 16 volumes, 1820; his *Œuvres inédites* in 4 volumes, 1824. Didot published an edition in 24 volumes, Briand another in 13, and Jauffret a third in 12. The editions of some of the more popular works are extremely numerous.

See "Vie de Florian" prefixed to his *Œuvres posthumes*; A. J. N. de Rosny, *Vie de Florian*, Paris, An V.; Jauffret and Lacretelle, *Eloge de Florian*, 1812; Sainte-Beuve, *Causeries du lundi*, t. iii.

Plate II.

FLORIDA, the most southern of the United States of America, is a large promontory extending southwards into the Atlantic ocean, its southern and western coasts forming in part the northern and eastern shore line of the Gulf of Mexico.

The name of Florida was in the 16th and early part of the 17th century indefinitely applied to the territory now lying south of Virginia. By its charter the southern boundary of Carolina was fixed at the 29th parallel, thus including about one half of the present State of Florida. In 1738 the stipulated northern boundary of Florida was a line drawn due west from the mouth of the St. John's River (called by the Spaniards San Juan) to the little river Vasisa, cutting off all upper or continental Florida. At the time of its cession by Spain to Great Britain in 1763, the territory of Florida extended as far west as the Mississippi River, including portions of the present States of Alabama, Mississippi, and Louisiana. The present boundaries are comprised between 24° 30′ and 31° N. lat., and 80° and 87° 45′ W. long.

Florida makes the southern boundary of the State of Georgia, and in part that of Alabama, from which it is separated on the north-west by the river Perdido. The Atlantic washes its eastern, and the Gulf of Mexico its southern and western coasts, constituting a sea-board of more than 1000 miles. On the south-east it is separated from the Bahamas by the Straits of Florida. It points towards Cuba on the south, Havana being about 110 miles from Key West. Its entire length from Perdido river to Cape Sable is about 700 miles, its mean breadth 90 miles. The estimated area of Florida is 59,268 square miles, or 37,931,520 acres, of which 2,373,541 acres were in 1870 included in farms. The population in 1870 was 187,748.

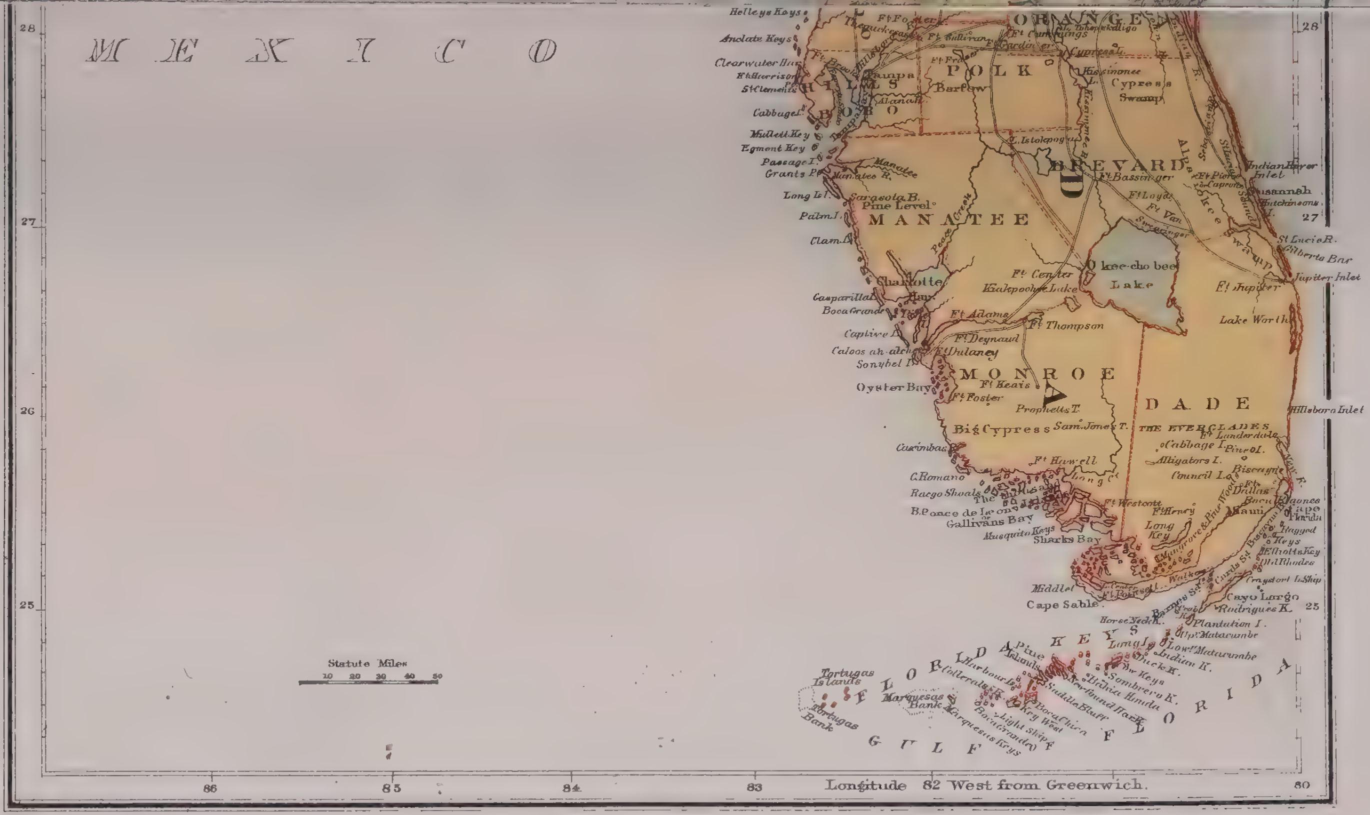
The peninsula proper terminates on the south in Cape Sable; but a remarkable chain of rocky islets, called the Florida Keys, begins at Cape Florida on the eastern shore, extends south-westerly nearly 200 miles in a direction generally conforming with that of the coast, and ends in the cluster of sand-heaped rocks known as the Tortugas, from the great number of turtle formerly frequenting them. South of the bank on which these Keys rise, and separated from them by a navigable channel, is the long, narrow, and dangerous coral ridge known as the Florida Reef. This group of keys and reefs is washed on the south by the constant current of the Gulf Stream. The most important of the keys is Key West, a nautical corruption of *Cayo Hueso* or Bone Key, which name originated in the great number of bones found on the island by the Spaniards, supposed to be those of the aboriginal inhabitants. The island was long the haunt of smugglers and pirates, but is now a busy and thriving place, and one of the most important naval stations possessed by the United States, on account of its commanding situation at the entrance of the most frequented passage into the Gulf of Mexico, as well as its nearness to Havana, Kingston, and other important ports of the West Indies, belonging to European powers.

The Gulf Coast of the State is intersected by numerous bays, among which are Pensacola, Choctawhatchee, St. Andrew's, Appalachicola, Appalachee, Tampa, Charlotte, Ponce de Leon or Chatham, and Florida Bays, the last lying between the Keys and mainland. The chief rivers are St. John's, navigable about 100 miles for vessels of moderate draught, and emptying into the Atlantic after a northerly course of 300 miles; Indian River, a long narrow lagoon on the eastern coast, which it is proposed to unite by a canal with the St. John's; the Suwanee and Ockloconee, which rise in Georgia and flow into the Gulf of Mexico; the Appalachicola, formed by the Chattahootchee and Flint rivers, and emptying into the bay of the same name; Choctawhatchee, Escambia, and Perdido, also flowing into the Gulf. The St. Mary's makes for some distance the northern boundary of the State. Florida has also numerous lakes, some of which are navigable. Lake Okeechobee, in the Everglades, is about 40 miles long and 30 broad.

Surface and Soil.—The surface is generally level, the greatest elevation being not more than 300 feet above the sea, although old maps represent it as mountainous. The most remarkable feature is the immense tract of marsh filled with islands in the southern part of the State, called the Everglades, and by the Indians "grass-water." Between the Suwanee and Chattahootchee the country is hilly; the western portion of the State is level. De Bow designates the lands as high-hummock, low-hummock, swamp, savanna, and pine. The soil is generally sandy, except in the hummocks, where it is intermixed with clay. These hummocks vary in extent from a few to thousands of acres, and are found in all parts of the State. They are usually covered with a heavy growth of red, live, and water oak, magnolia, pine, and dogwood. When cleared they afford desirable openings for cultivation. The savannas are rich alluvions on the margins of streams or lying in detached tracts, yielding largely, but requiring ditching and dyking in ordinary seasons. In the "barrens," as the pine forests are called, the soil is very poor, and thickly overgrown with pine and cypress. The district comprised in the Everglades is impassable during the rainy season, from July to October. It is about 60 miles long by 60 broad, covering most of the territory south of Lake Okeechobee, or Big-water. The islands with which this vast swamp or lake is studded vary from one-fourth of an acre to hundreds of acres in extent. They are generally covered with dense thickets of shrubbery or vines, occasionally with lofty pines and palmettos. The water is from 1 to 6 feet deep, the bottom being covered with a growth of rank grass. The vegetable deposit of the Everglades is considered well adapted to the cultivation of the banana and plantain. Another remarkable feature of Florida are the subterranean streams which undermine the rotten limestone formation, creating numerous cavities in the ground called "sinks." These are inverted conical hollows, or tunnels, varying in extent from a few yards to several acres, at the bottom of which running water often appears.

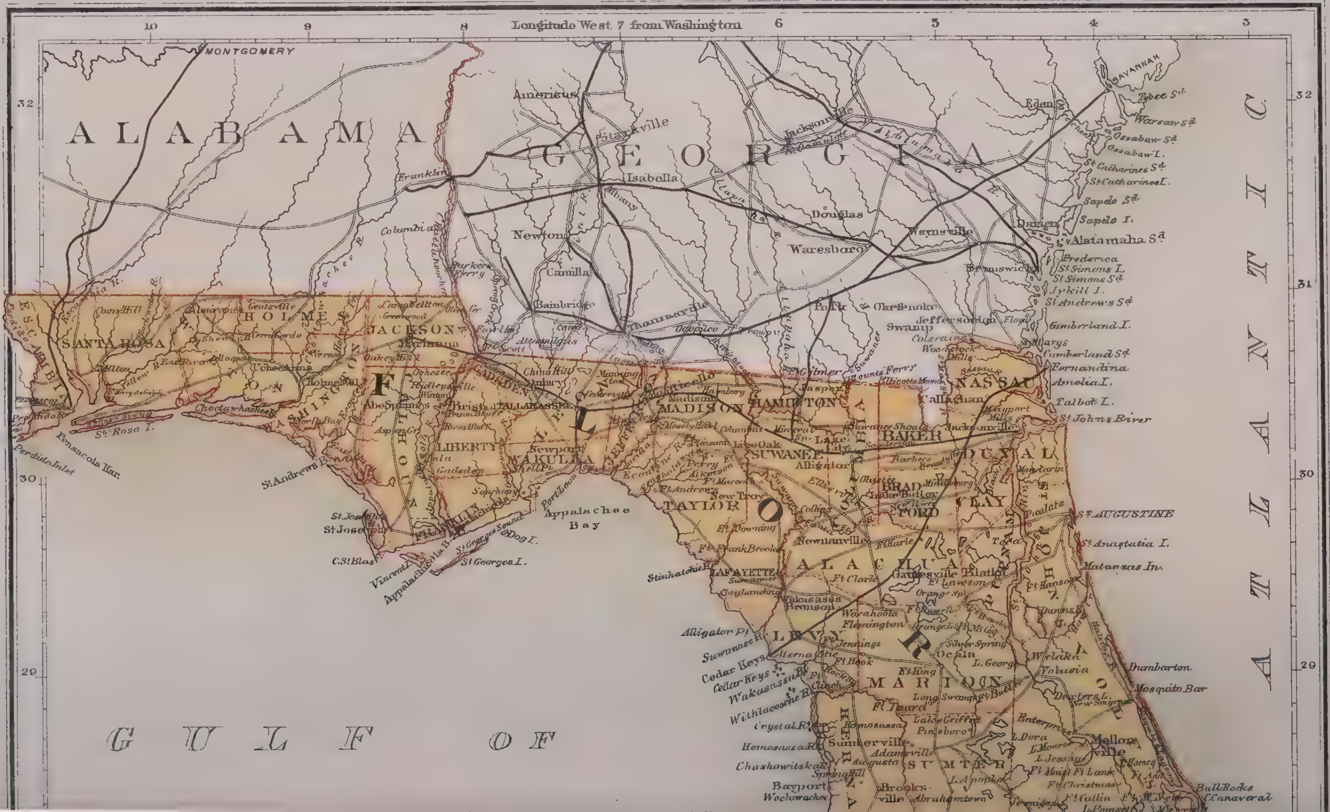
A most remarkable spring, situated 12 miles from Tallahassee, has been sounded with 250 fathoms of line before finding bottom. The outflow forms a beautiful lake, transparent and cold as ice even in the hottest weather. The great sink of Alachua county is a subterranean passage by which the waters of the Alachua savanna are supposed to discharge themselves into Orange Lake. In fact, the geological structure of the State is remarkable, much of its surface seeming a crust through the openings of which underground lakes and rivers force their way.

Towns and Harbors.—Notwithstanding the great extent of its sea-coast, Florida has few good harbors. Besides being a naval station, Key West is a place of considerable importance. Pensacola, Appalachicola, St. Mark's, Cedar Keys, Tampa, and Charlotte on the Gulf, and Fernandina and St. Augustine on the Atlantic coast, are the principal



ENCYCLOPÆDIA BRITANNICA, NINTH EDITION.

FLORIDA


Longitude West 7 from Washington
10
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ALABAMA
MONTGOMERY
GEORGIA
Americus
Starkville
Franklin
Isabella
Albany
Newton
Camilla
Bainbridge
Thomasville
Douglas
Waresboro
Waynesville
Brunswick
Darien
Jacksonville
Eden
SAVANNAH
Tybee Sd.
Warsaw Sd.
Ossabaw Sd.
Ossabaw I.
St. Catharines Sd.
St. Catharines I.
Sapelo Sd.
Sapelo I.
Alatamaha Sd.
Frederica
St. Simons Sd.
St. Andrews Sd.
Cumberland I.
Cumberland Sd.
Fernandina
Amelia I.
Talbot I.
St. Johns River
FLORIDA
ESCAMBIA
SANTA ROSA
HOLMES
WASHINGTON
JACKSON
CALHOUN
LIBERTY
FRANKLIN
WAKULLA
LEON
JEFFERSON
MADISON
HAMILTON
TAYLOR
LAFAYETTE
SUWANEE
COLUMBIA
BAKER
NASSAU
DUVAL
BRADFORD
CLAY
ALACHUA
PUTNAM
ST. JOHNS
LEVY
MARION
VOLUSIA
HERNANDO
SUMTER
ORANGE
Pensacola Har.
Perdido Inlet
St. Rosa I.
Choctawhatchee B.
St. Andrews B.
St. Joseph B.
C. St. Blas
Apalachicola B.
St. Georges Sound
St. Georges I.
Dog I.
Appalachee Bay
TALLAHASSEE
Marianna
Monticello
Madison
Jasper
Lake City
Callahan
Jacksonville
St. AUGUSTINE
St. Anastatia I.
Matanzas In.
Palatka
Gainesville
Ocala
Cedar Keys
Alligator Pt.
Suwanee R.
Wakasassa B.
Withlacoochee R.
Crystal R.
Homosassa R.
Chashowitska R.
Bayport
Wochwachee
Brooksville
Sumterville
Mellonville
Dunbarton
Mosquito Bar
Bull Rocks
C. Canaveral
GULF OF
ATLANTIC

ports. Of these the harbors of Pensacola and Fernandina are the best. The cities of Florida are Jacksonville, population in 1870, 6912; Pensacola, 3347; Tallahassee, the capital, 2023; and St. Augustine, 1717. Jacksonville, on St. John's River, is a flourishing city, much resorted to by invalids from the northern States on account of the salubrity of its climate. Fernandina, the eastern terminus of the railway which crosses the State to Cedar Keys, on the Gulf of Mexico, has 1722 inhabitants.

Climate.—Florida, except in the vicinity of the swamps, possesses one of the most equable and agreeable climates of the continent. Occupying as it does a situation between the temperate and tropical regions, it enjoys exemption from the frosts and sudden changes of the one and the excessive heat of the other. The mercury, however, sometimes falls to the freezing point, and great damage is done to the orange plantations. The winter climate of the Gulf coast is more rigorous than that of the Atlantic. The seasons partake of the tropical character, winter being distinguishable by copious rains. Statistics show the State to be one of the healthiest, if not the healthiest, of the United States, and its resident population is largely increased in the winter months by invalids from the North, seeking a more genial clime. Jacksonville, St. Augustine, and Key West are preferred by this class of visitors, who are every year becoming more numerous. The mean winter temperature as observed at Key West was slightly less than that of Havana; while for the months from July to November it was about the same. Besides the advantage of its climate, the semi-tropical character of Florida offers a grateful and striking change of scene to the health-seeker, who leaves the bare forests and frozen streams of New England for a country teeming with luxuriant vegetation and strewed with flowers.

Products.—The productions of Florida are of an essentially tropical character: cotton, tobacco, rice, sugar-cane, arrow-root, hemp, flax, coffee, and the cocoa-nut flourish there. The climate is also favorable to the cultivation of the silk-worm and for the cochineal insect. Oranges, bananas, lemons, limes, olives, grapes, pine-apples, grow abundantly, and are of exquisite flavor. Indian corn, sweet potatoes, beans, peas, and such products of a more northern climate as Irish potatoes, barley, buckwheat, hops, etc., are also raised. The cultivation and export of oranges and other fruits have grown to be a considerable source of wealth to the State; and the manufacture of cigars, especially at Key West, is becoming an important industry. The pasturage afforded by the savannas is excellent, cattle requiring little or no attention from their owners, and no housing in winter. Game and fish abound in every part of the State. Deer, wild turkeys, partridges, geese, ducks, and other small game are in all the forests and about all the lakes, rivers, and swamps; green turtle, oysters, sheep's-head, red-fish, mullet, etc., are found on all the coasts, and freshwater fish in all the inland waters. Magnificent sponges are gathered along the reefs, and form a considerable item of trade. Cotton, rice, sugar, tobacco, lumber, fish, and fruits may be considered the most valuable products. From selected statistics, compiled by the United States Government, it appears that Florida produced in 1870—Indian corn, 2,225,056 bushels; oats, 114,204 bushels; cotton. 39,789 bales; wool, 37,562 ℔; rice, 401,687 ℔; cane, 553,192 galls.; Irish potatoes, 10,218 bushels; sweet potatoes, 789,456 bushels; peas and beans, 64,846 bushels; honey, 150,854 ℔. Florida cotton is grown almost exclusively in the northern group of counties, but the State is capable of producing the celebrated Sea Island variety, the cultivation of which was formerly confined to a few islands on the coasts of South Carolina and Georgia. Appalachicola, formerly a considerable shipping port for cotton, has been superseded by Fernandina on the Atlantic. The crop of 1876–77 is reported at 34,303 bales, of which 11,214 was Sea Island; but it should be stated that this computation includes only shipments from Florida outports, there being no data whence to estimate accurately the quantity going to ports out of the State by rail. The same remark will apply to the quantity of wool exported.

The wool grown in Florida is long-stapled, of medium and coarse grades; little attention being as yet given to producing fine wools. In 1878 the flocks had increased to 56,500 head, yielding 200,000 ℔ of wool.

In 1874 Gadsden county produced on 327 acres planted 216,000 ℔ of tobacco, of excellent quality, valued at $44,000. East and South Florida rely mainly upon fruit culture. Florida is said to be the only section of the Union where the orange can be grown to any extent with success. There is no fear of winter-killing south of Pilatka. The quality of the fruit and the excellent condition in which it reaches the northern markets render this a most profitable crop.

The forests of Florida form no inconsiderable source of wealth. The live-oak, so valuable in shipbuilding, abounds, also the other varieties of oak, swamp cypress, hickory, pine, magnolia, dogwood, and laurel. The palma christi (castor-oil bean) becomes here a large tree; on the islands and keys boxwood, satinwood, mastic, and lignum-vitæ grow abundantly. The pine is found from Cape Sable to near Indian River. In addition to fruit-bearing species, the pimento, coffee, pepper, clove, and other spice trees and shrubs may be successfully cultivated.

From the official sources of information it appears that in 1870 the value of the live stock on farms was $5,212,157. The number of horses was 11,902; mules and asses, 8835; milch cows, 61,932; draught and other cattle, 322,701; sheep, 26,509; swine, 158,908. Florida also produced 100,989 ℔ butter. These numbers will be largely increased by the census of 1880.

Manufactures.—These are unimportant, and are chiefly confined to flour and grist mills, lumber mills, and establishments for the manufacture of sugar and molasses, their total value in 1870 being $4,685,403. Agriculture and commerce are the chief resources of the State,—the export of its fibrous products, cereals, fruits, fish, live-oak and other timber, giving employment to a considerable tonnage. Among the mineral productions may be named amethyst, turquoise, lapis-lazuli, ochre, coal, and iron-ore.

Trade.—The coasting trade employs many steamers and sailing craft, plying chiefly between Florida ports and Savannah, Baltimore, Philadelphia, and New York. Pensacola and Appalachicola are naturally points of shipment for southern Alabama and south-western Georgia. The bulk of foreign merchandise reaches the State from northern ports instead of by direct importation. Key West shows much the largest tonnage of vessels entering or clearing, St. John's and Fernandina following in the order named. Shipbuilding is carried on at all the ports, the vessels usually being of small burden, for coast traffic.

Railways.—In 1876 there were only 484 miles of railway in Florida. The Jacksonville, Pensacola, and Mobile railroad extends west from Jacksonville to Chattahootchee, and is the longest in the State. Lateral lines connect this line with the Georgia system by a branch from Live Oak due north to Dupont, and with St. Mark's on the Gulf by a branch south from Tallahassee. The Atlantic, Gulf, and West India Transit Company's line extends from Fernandina on the Atlantic to Cedar Keys on the Gulf, distance 155 miles. The Pensacola and Louisville road extends from Pensacola north to a junction with the Mobile and Montgomery (Alabama) railroad, 45 miles. The St. John's River line crosses from St. Augustine to Tocoi on the St. John's, 14 miles.

Administration.—The government of Florida is similar to that of the other States of the American Union. The executive power is vested in a governor elected by the people every four years. The legislative power is represented by a senate elected for four years, and a house of representatives or assembly chosen for two years, both by popular vote. The judiciary consists of a supreme court, having one chief and two associate judges, who hold three annual sessions in Tallahassee; there are also seven circuit besides other inferior courts. Florida has two members in the national house of representatives, and has therefore (with the two senators to which each State is entitled) only four votes in the electoral college. The State is divided into 39 counties, viz., Alachua, Baker, Bradford, Brevard, Calhoun, Clay, Columbia, Dade, Duval, Escambia, Franklin, Gadsden, Hamilton, Hernando, Hillsborough, Holmes, Jackson, Jefferson, Lafayette, Leon, Levy, Liberty, Madison, Manatee, Marion, Monroe, Nassau, Orange, Polk, Putnam, St. John's, Santa Rosa, Sumter, Suwanee, Taylor, Volusia, Wakulla, Walton, Washington.

Education.—Florida has neither college nor university, although an agricultural college has been incorporated; the financial condition of the State and people after the close of the great civil war has greatly retarded educational development. There is no public library of 10,000 volumes in the State. In 1876, out of a school population numbering 74,828 persons, the number actually attending public schools was only 26,052. The total expenditure for educational purposes was $2,126,541. The slow development of education in the State may also be attributed to the numerous colored population (91,384 in 1870) formerly held in slavery, which is wholly engaged in tilling the soil and kindred pursuits. Since the war Florida has received large accessions to its population from other States, and is undergoing changes which will, it is believed, ultimately lead to its taking a higher rank in the Union. In 1870, there were in the State 23 newspapers and periodicals, with a total circulation of 10,545. The total number of religious organizations was 420, having 390 places of worship, and property valued at $426,520.

History.—The history of Florida is interesting. The various attempts at colonization by Europeans of which we have authentic accounts go farther back than in any other part of the North American continent, preceding the efforts of the French in Canada, the English in Virginia, and even of the Spaniards themselves in Mexico. St. Augustine is the oldest settlement founded by Europeans, not only of the United States, but of North America, and still shows traces of Spanish occupation two centuries ago. Remains of fortifications, roads, etc., are found between the Suwanee and Chattahootchee. In 1512, seven years before the invasion of Mexico by Cortes, Juan Ponce de Leon discovered the mainland of Florida on Easter Sunday, *Pascha Floridum*, the supposed derivation of the name. The discoverer landed at a place called the Bay of the Cross, took formal possession, and planted a stone cross in sign of the jurisdiction of Spain. He continued his explorations in the interior and along the coast for some months before sailing to Spain. The following year he was named governor of and received permission from Ferdinand to colonize the "Island of Florida." His efforts, however, proved unsuccessful. The place of his original landing is supposed to be a few miles north of Saint Augustine.

The next effort at colonization was the disastrous one of Pamphilo de Narvaez in 1528. He sailed from Cuba with 400 men, landed in the bay of Pensacola, and remained in the country nearly six months, when he re-embarked and perished in a tempest near the mouth of the Mississippi. Four survivers of this expedition succeeded, after incredible hardships, in reaching Mexico.

Hernando de Soto landed on May 30, 1539, at what is now Tampa Bay, called by the Spaniards "Spiritu Santo." De Soto believed Florida a new El Dorado. He had the title of *Adelantado*, or president, from the emperor, and undertook the conquest at his own expense. He passed the first winter in the country of the Appalachians, east of Flint River. After a sanguinary conflict with the natives, who opposed his advance into the interior, and the loss of many men by disease, De Soto reached the Mississippi, where he died from fever while endeavoring to descend its banks to the mouth.

Réné Goulaine de Laudonnière, who had accompanied Jean Ribault in his expedition to Port Royal (1562), landed first at what is now St. Augustine, subsequently in the river St. John, called by him the "River of May," and built Fort Caroline in 1564. The colonists, who were Huguenots, were on the point of abandoning the settlement when reinforced by Ribault; but he had scarcely anchored when a Spanish fleet under Menendez appeared. Ribault made his escape for the moment. Soon after Menendez surprised and massacred the garrison of Fort Caroline, carrying out to the letter his barbarous order to "gibbet and behead all Protestants in those regions." In endeavoring to return to Fort Caroline, Ribault and his party also fell into the hands of Menendez, and shared the fate of their companions. The French were all hanged with the inscription affixed to them —"Not as Frenchmen, but as heretics."

Aviles de Menendez, referred to as exterminating the French settlement on the St. John, landed September, 1565, and laid the foundation of the town, named by him St. Augustine. Two years later a French expedition commanded by Dominique de Gourgues, seized two forts near the mouth of the St. John, and the important one of San Mateo, and in retaliation for the cruelty of Menendez hanged all his prisoners, "not as Spaniards, but as assassins." De Gourgues's head was demanded by the Spanish king, and he was for a time compelled to live in concealment. Menendez afterwards rebuilt San Mateo.

On the 28th of May, 1586, Sir Francis Drake, then returning from his memorable expedition to the West Indies, discovered a scaffold raised upon four high masts, evidently a look-out station, upon the Florida coast. No one in the fleet had any knowledge that the Spaniards possessed a place there. Drake therefore ordered the pinnaces to make a reconnaissance. Having entered an inlet they came to the fort St. Juan de Pinos, from which the garrison fled to St. Augustine; and on the approach of the English they also abandoned this place, which had the appearance of a prosperous settlement, with its council-house, church, and handsome gardens. The invaders destroyed the town and meditated an attack on St. Helena, twelve leagues further up the coast, but were deterred from want of a pilot to conduct them safely through the intricate and dangerous shoals. Drake pursued his voyage to Virginia, where the queen had commanded him to afford relief to Sir Walter Raleigh's newly planted colony.

The English colonists of Georgia and Carolina continued to wage war against the Spaniards in Florida. Governor Moore of South Carolina made an unsuccessful attempt on St. Augustine in 1702; and General Oglethorpe of Georgia besieged it in 1740 with the same result. Nearly a hundred years later, in 1837, the U. S. engineers found balls thrown by Oglethorpe in the moat of the old Spanish fortress. In 1763 Florida was ceded to Great Britain in return for Havana, captured by Albemarle the previous year. Most of the Spaniards left the country. Vigorous efforts were made by the British Government to promote settlement by liberal grants of land to settlers. Besides a large number of emigrants who came over from Europe, promising settlements were made under the patronage of Lords Rolle and Beresford and Governor Moultrie. In addition to these many royalists emigrated thither from Georgia and Carolina, on the breaking out of hostilities between Great Britain and her American colonies. Twenty years of British possession accomplished more in settling and improving Florida than two hundred years of Spanish rule.

In 1781 Don Bernardo de Galvez, Spanish governor of Louisiana, having previously taken Mobile, besieged and captured Pensacola, thus completing the conquest of West Florida. In 1783 Florida was ceded back to Spain, when the greater part of the English population, estimated at 25,000, left the province and passed into the adjoining States. Some unimportant military operations took place in 1814. In February, 1819, a treaty for the cession of Florida to the United States was concluded at Washington, and in 1821 was reluctantly ratified by the king of Spain, thus concluding a long and tedious negotiation. Possession was taken in July by General Jackson, who had been appointed governor of the Floridas by the Government at Washington. Immigration flowed in rapidly from the Southern States, the Bahamas, and even the North Atlantic States; but a great drawback to the prosperity of the newly acquired territory was found in the determined resistance of the warlike nation of Seminole Indians to the encroachments of the whites upon their hunting-grounds. A resolution on the part of the United States Government to remove these Indians led to the long and bloody struggle known as the Seminole War, in which for seven years the Indians successfully defied every effort to subdue them, retreating into the fastnesses of the Everglades when closely pressed. Osceola, chieftain of the Seminoles, having been captured by treachery, the war ended in 1842. The remnant of the Indians were removed beyond the Mississippi, and in three years after their expulsion (1845) Florida was admitted into the Union as a State.

On the 10th January, 1861, Florida, by a convention assembled on the 3d, seceded from the Union. Fort Marion and the arsenals at St. Augustine and Chattahootchee were seized on the 7th, the forts and dockyards at Pensacola on the 12th, except Fort Pickens, on Santa Rosa island, which was held by the United States forces. Not being within the line of great military operations, the conflicts between the Federal and Confederate forces were of minor importance. Fernandina, Jacksonville, and St. Augustine fell into the hands of the national forces early in 1862. Pensacola was reoccupied by them the same year. In April, 1865, President Johnson, by a proclamation, declared the restrictions on commercial intercourse with Florida removed; in July William Marvin was named provisional governor. A State convention assembled in October at Tallahassee which repealed the ordinance of secession.

Civil government was practically resumed the following year by the election of State officers and a legislature. A subsequent State convention met at Tallahassee, January 20, 1868, to form a new constitution, which was ratified by the people in May, a legislature and State officers being chosen at the same election. The State having complied with the enactments of Congress relative to reconstruction resumed its place in the Union. In 1876 the election of Rutherford B. Hayes, republican, as president of the United States, over Samuel J. Tilden, democrat, was determined by the electoral votes of Florida and Louisiana, which by a decision of the extraordinary commission created by Congress were counted for the former. (S. A. D.)

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FLORIDA-BLANCA, DON JOSE MONINO Y REDONDO, COUNT OF (1728–1808), Spanish statesman, was born at Murcia in 1728. He was the son of a notary, and received a good education, which he completed at the university of Salamanca, especially applying himself to the study of law. For a time he followed the profession of an advocate, and acquired a high reputation. A more public career was opened to him by the marquis of Esquilache, then chief minister of state, who sent him ambassador to Pope Clement XIV. Successful in his mission, he was soon after appointed by Charles III. successor to his patron, and his administration was one of the most brilliant Spain had ever seen. He regulated the police of Madrid, reformed many abuses, projected canals, established many societies of agriculture and economy, and many philanthropical institutions, and gave encouragement to learning, science, and the fine arts. Commerce flourished anew under his rule, and the long-standing disputes with Portugal about the South American colonies were settled. He sought to strengthen the alliance of Spain with Portugal by a double marriage between the members of the royal houses, designing by this arrangement to place ultimately a Spanish prince on the throne of Portugal. But in this he failed. His attacks on Algiers in 1775, and on Gibraltar in 1782, cost Spain the loss of nearly 80,000 men. He dealt a heavy blow to the Cortes, prevailing upon them by various forms of bribery, and by sowing dissension among the members, to proclaim the heir to the throne without making the customary assertion of their privileges. He retained his office for three years under Charles IV.; but in 1792, through the influence of his enemies, he was dismissed and imprisoned in the castle of Pampeluna. Here he was saved from starvation only by the intervention of his brother. He was afterwards allowed to retire to his estates, and remained in seclusion till the French invasion of 1808. He was then called by his countrymen to take the presidency of the central junta. But his strength failed him, and he died at Seville, November 20 of the same year. He left several short treatises on jurisprudence.

FLORIO, GIOVANNI (about 1552–1625), lexicographer and translator, was born in London about 1552. He was of Tuscan origin, his father and mother being Waldenses who had fled from persecution in the Valtelline and taken refuge in England. The family left England on the accession of Queen Mary, but returned after her death. The son resided for a time at Oxford, and was appointed, about 1576, preceptor to the son of Barnes, bishop of Durham, then studying at Magdalen College. In 1578 Florio published a work entitled *First Fruits, which yield Familiar Speech, Merry Proverbs, Witty Sentences, and Golden Sayings* (4to). This was accompanied by *A Perfect Induction to the Italian and English Tongues*. The work was dedicated to the earl of Leicester. Three years later Florio was admitted a member of Magdalen College, and became a teacher of French and Italian in the university. In 1591 appeared his *Second Fruits, to be gathered of Twelve Trees, of divers but delightsome Tastes to the Tongues of Italian and English men;* to which was annexed the *Garden of Recreation, yielding six thousand Italian Proverbs* (4to). His Italian and English dictionary, entitled *A World of Words*, was published in folio in 1598. After the accession of James I., Florio was named French and Italian tutor to Prince Henry, and afterwards became a gentleman of the privy chamber and clerk of the closet to the queen, whom he also instructed in languages. His last work, and that by which he has been most known, was his translation of Montaigne's *Essays*, published in folio in 1603, and dedicated to the queen. Special interest attaches to this translation from the circumstance that of the several copies of the first edition in the British Museum library one bears the autograph of Shakespeare and another that of Ben Jonson. It has been suggested that Florio is satirized by Shakespeare under the character of Holofernes, the pompous pedant of *Love's Labor's Lost.* He is characterized by Wood, in *Athenæ Oxonienses*, as a very useful man in his profession, zealous for his religion, and deeply attached to his adopted country. When the plague raged in London in 1625, Florio sought escape from it by retiring to Fulham; but he was there seized and carried off by it in the autumn of the same year.

FLORIS, FRANS, or more correctly Frans de Vriendt called Floris (1520–1570), was one of a large family trained to the study of art in Flanders. Son of a stone-cutter, Cornelis de Vriendt, who died at Antwerp in 1538, he began life as a student of sculpture, but afterwards gave up carving for painting. At the age of twenty he went to Liége, and took lessons from Lambert Lombard, a pupil of Mabuse, whose travels in Italy had transformed a style truly Flemish into that of a mongrel Leonardesque. Following in the footsteps of Mabuse, Lambert Lombard had visited Florence, and caught the manner of Salviati and other pupils of Michelangelo and Del Sarto. It was about the time when Schoreel, Coxcie, and Heemskerk, after migrating to Rome and imitating the masterpieces of Raphael and Buonarroti, came home to execute Dutch-Italian works beneath the level of those produced in the peninsula itself by Leonardo da Pistoia, Nanaccio, and Rinaldo of Mantua. Fired by these examples, Floris in his turn wandered across the Alps and appropriated without assimilation the various mannerisms of the schools of Lombardy, Florence, and Rome. Bold, quick, and resolute, he saw how easy it would be to earn a livelihood and acquire a name by drawing for engravers and painting on a large scale after the fashion of Vasari. He came home, joined the guild of Antwerp in 1540, and quickly opened a school from which 120 disciples are stated to have issued. Floris painted strings of large pictures for the country houses of Spanish nobles and the villas of Antwerp patricians. He is known to have illustrated the fable of Hercules in ten compositions, and the liberal arts in seven, for Clæs Jongeling, a merchant of Antwerp, and adorned the duke of Arschot's palace of Beaumont with fourteen colossal panels. Comparatively few of his works have descended to us, partly because they came to be contemned for their inherent defects, and so were suffered to perish, partly because they were soon judged by a different standard from that of the Flemings of the 16th century. The earliest extant canvas by Floris is the Mars and Venus ensnared by Vulcan in the Berlin Museum (1547), the latest a Last Judgment (1566) in the Brussels gallery. Neither these nor any of the intermediate works at Alost, Antwerp, Copenhagen, Dresden, Florence, Léau, Madrid, St. Petersburg, and Vienna display any charm of originality in composition or in form. Whatever boldness and force they may possess, or whatever principles they may embody, they are mere appropriations of Italian models spoiled in translation or adaptation. Their technical execution reveals a rapid hand, but none of the lustre of bright coloring; and it is not too much to say that whilst Floris failed to acquire absolute mastery over design as improved by the Italians, he was equally devoid of the gifts which distinguish the earlier colorists of Flanders. Vasari justly praises the plates engraved by contemporaries from the drawings of Floris, but he adds that these plates would have been better had the skill of the draughtsman been more ably seconded by that of the engraver. A more temperate judgment will probably be that Floris owed much of his repute to the cleverness with which his works were transferred to copper by Jerome Cock and Theodore de Galle. Whilst Floris was engaged on a Crucifixion of 27 feet, and a Resurrection of equal size, for the Grand Prior of Spain, he was seized with illness, and died on the 1st of October, 1570, at Antwerp. His burial took place three days later in the cemetery of the Récollets.

FLORUS, a Roman historian, author of the *Epitome de Gestis Romanorum*, has by some writers been identified with the Lucius Julius Florus who lived in the time of Augustus, and to whom Horace addressed two of his epistles; but this position is hardly tenable, as Florus in the introduction to his history writes of the emperor Trajan as then reigning. By others he is, on account of certain similarities in style, identified with the Publius Annius Florus who lived in the time of Hadrian, and wrote a dialogue on the question whether Virgil was an orator or a poet, and the *Pervigilium Veneris*, an imitation of Horace's *Secular Hymn*. In some MSS. of the *Epitome*, the name of the writer is mentioned as L. Annæus Florus, in others as L. Julius Florus, in others L. Annæus Seneca, and in the Bamberg codex Julius Florus. If the historian be the same person as the poet and rhetorician, Julius Annæus must be regarded as a corruption of Publius Annius. The *Epitome* of Florus is compiled chiefly from Livy, and gives a condensed view of Roman history from the foundation of the city to the closing of the temple of Janus by Augustus. The details of geography and chronology are not always to be implicitly trusted; and the style is declamatory, and rather that of a panegyrist than of a critical historian. The best editions of the work are that of Titze, Prague, 1819, and that of O. Jahn, Leipsic, 1852. The latter has been revised by C. Halm, Leipsic, 1854.

FLOTSAM, Jetsam, and Ligan, in English law, are goods lost at sea, as distinguished from goods which come to land, which are technically designated *wreck*. "Jetsam is when goods are cast into the sea, and there sink and remain under water; flotsam is where they continue swimming on the surface of the waves; ligan is where they are sunk in the sea, but tied to a cork or buoy in order to be found again." Flotsam, jetsam, and ligan belong to the king in the absence only of the true owner. Wreck, on the other hand (*i.e.*, goods cast on shore), was by the common law adjudged to the king in any case, because it was said by the loss of the ship all property was gone out of the original owner. This singular distinction which treated goods washed ashore as lost, and goods on and in the sea as not lost, is no doubt to be explained by the primitive practice of plundering shipwrecks. See the article Wreck, for the law relating to that subject.

FLOUNDER (*Pleuronectes flesus*) is one of the most common Flat-fishes along the coasts of northern Europe, from the British Channel to Iceland. It is more partial to fresh water than any other Flat-fish, ascending rivers far beyond the reach of the tide, as, for instance, the Rhine as far as Cologne. It very rarely exceeds the length of twelve inches, and a weight of 1½ pounds.

FLOUR, Manufacture of. Flour is the grain of wheat reduced to powder, and separated from the outer husk or coverings in which the seed is enveloped. The name is also applied to the grain of other cereals, and to the farinaceous seed of pulses similarly treated, and it is used generally to indicate any finely powdered dry substance; but when the term is employed without any qualification, it invariably means wheaten flour. As preparations of flour form the staple food of all civilized communities of the West, the cultivation of wheat and the manufacture of flour are necessarily industries of the greatest magnitude and importance, rice being the only other grain which rivals (and which indeed possibly surpasses) wheat in the number of human beings it feeds.

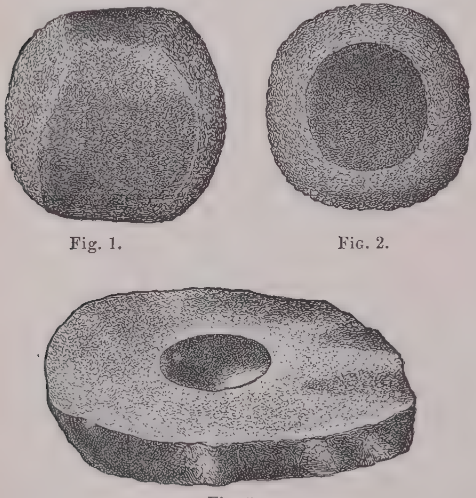

Fig. 1. Fig. 2.

Fig. 3.

Figs. 1–3.—Primitive Corn-crushers (from Keller's *Lake Dwellings*).

The cultivation of wheat was one of the earliest developments of human civilization, and there are not wanting evidences that in making use of the grain the primitive races submitted it to a coarse pounding or grinding, thereby reducing it to a state resembling the meal of the present day. From remains found on the sites of the ancient lake dwellings of Switzerland it is obvious that the original form of corn-crushing or mealing apparatus consisted of a roundish stone—generally very hard sandstone—about the size of a man's fist, with certain hollows or flattened surfaces on two opposite sides (figs. 1–3). The rounded outline of the stone worked and fitted into a corresponding cavity in another stone in which the grain to be crushed or pounded was placed. By the deepening of the cavity in the under stone and the addition of a wooden handle to the upper stone ball, would be formed the mortar and pestle; and in another direction, by fitting the upper stone for a motion of rotation within the cavity of the lower, the form of the quern would be produced, and the germ of the modern flour-mill elaborated. In early times, and indeed amid rude forms of society still, the preparation of meal and flour was a part of the domestic operations of preparing bread and otherwise cooking of food. At a period so remote as that of the patriarch Abraham it appears there was a distinction in the qualities of the flour or meal which could be produced, as Sarah was directed to "make ready quickly three measures of *fine* meal, knead it, and make cakes upon the hearth." There is much probability in the suggestion of Dr. Livingstone that the grinding apparatus used by Sarah was similar to that still used in Central Africa, and figured in the frontispiece of his *Zambesi and its Tributaries*. In that work the apparatus is thus described:—

> "The mill consists of a block of granite, syenite, or even mica-schist, 15 or 18 inches square, and 5 or 6 thick, with a piece of quartz or other hard rock, about the size of a half brick, one side of which has a convex surface, and fits into a concave hollow in the large and stationary stone. The workwoman kneeling grasps this upper millstone with both hands, and works it backwards and forwards in the hollow of the lower millstone, in the same way that a baker works his dough when pressing it and pushing it from him. The weight of the person is brought to bear on the movable stone, and while it is pressed and pushed forwards and backwards, one hand supplies every now and then a little grain, to be thus at first bruised, and then ground on the lower stone, which is placed on the slope, so that the meal when ground falls on to a skin or mat spread for the purpose. This is, perhaps, the most primitive form of mill, and anterior to that in Oriental countries, where two women grind at one mill, and may have been that used by Sarah of old when she entertained the angels."

That the two forms of grinding apparatus were familiar to the nations of antiquity is obvious from the allusions made to both in the Pentateuch. In the book of Numbers (xi. 8) we read that the Israelites gathered manna, "ground it in mills, or beat it in a mortar;" and again in Deuteronomy (xxiv. 6) there is an injunction that "no man shall take the nether or the upper millstone to pledge, for he taketh a man's life to pledge." Numerous other allusions to mills, mortars, and the grinding of corn are scattered throughout Scripture, from which it is made clear that the grinding of corn was, among the Hebrews, a domestic employment left entirely to women. Among the ancient Romans the mortar and pestle were alone used for pounding wheat, and the work was similarly done by women down to the year 173 B. C. At that date baking was established as a separate occupation, the craftsmen being called *pistores*, from *pinsere*, to pound, in allusion to their manner of preparing flour. At a subsequent date mills were introduced, of which the quern was the simplest and original form. It was called the *mola manuaria*, or *mola trusatilis*, and was worked chiefly by slaves, the labor being regarded as eminently degrading. Later the *mola asinaria* moved by animal power, and the *mola aquaria* or water mill, were employed as a substitute for hand-worked mills. Their *mola aquaria* approached in form and mechanism the rude small mills which existed in the more remote parts of Scotland and Ireland down till the early part of the present century. At the beginning of last century a pair of Roman millstones were found at Adel in Yorkshire, and described in the *Philosophical Transactions*. One stone, 20 inches in diameter, was convex in outline, while the other was concave, and retained traces of notching.

The quern, and exceedingly rude water mills, were in use throughout Great Britain for many centuries, and continued to be employed in outlying districts of Scotland and Ireland till very recent times. Strutt, in his *Chronicle of England*, says—"At what time mills were first used in Britain cannot be determined; hand-mills, which without doubt were the most ancient of any, we may conceive were known in the time of Ethelbert, king of Kent, who ruled that nation from the year 560 to the year 616; for in his laws a particular fine of twelve shillings is imposed upon any man who should corrupt the king's grinding maid;[1] hence it is also evident that they were turned and tended by women; but it is probable that before the end of the heptarchy water-mills were erected, because in ancient deeds and grants of lands we find mention made of mills, which are generally said to be situated near the water." Dr. Johnson, in his *Journey to the Western Islands of Scotland*, describes the working of the quern as seen by himself. "There are water mills," he says, "in Sky and Raasa, but where they are too far distant the housewives grind their oats with a quern or handmill, which consists of two stones about a foot and a half in diameter. The lower is a little convex, to which the concavity of the upper must be fitted. In the middle of the upper stone is a round hole, and on one side is a long handle. The grinder sheds the corn gradually into the hole with one hand, and works the handle round with the other. The corn slides down the convexity of the lower stone, and by the motion of the upper is ground in its passage." The accompanying woodcut (fig. 4) illustrates the leading forms of these primitive mills,—*a* representing a pair of rubbing stones, *b* a pot quern, and *c* an ordinary quern with hole in the centre of the upper stone into which the grain was fed, another hole towards one side for receiving the handle, and in the lower stone a spout through which the ground meal was delivered.

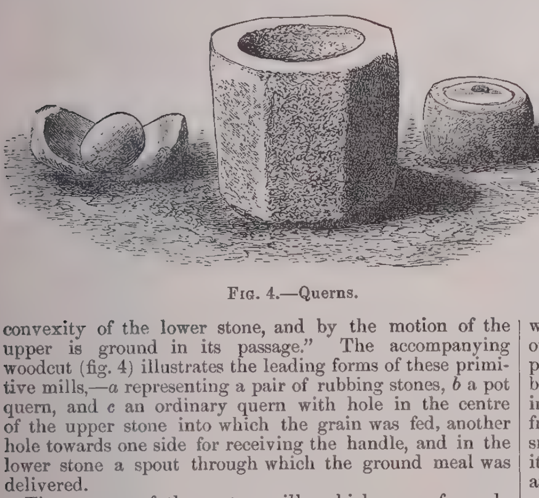

FIG. 4.—Querns.

The nature of the water mills which were formerly common in Great Britain and Ireland, and which continued in use well into the present century, may be gathered from the following description of one visited by Sir Walter Scott during his voyage to the Shetland Islands, etc., in 1814 (Lockhart's *Life*). "In our return, pass the upper end of the little lake of *Cleik-him-in*, which is divided by a rude causeway from another small loch, communicating with it, however, by a sluice, for the purpose of driving a mill. But such a mill! The wheel is horizontal, with the cogs turned diagonally to the water; the beam stands upright, and is inserted in a stone-quern of the old-fashioned construction. This simple machine is inclosed in a hovel about the size of a pig-stye, and there is the mill! There are about 500 such mills in Shetland, each incapable of grinding more than a sack at a time."

The ordinary flour mill of the present day is a structure of comparatively few essential parts; but in the arrangement and mounting of these the greatest amount of mechanical skill and experience has been exercised, and the accessories of the mill have been elaborated with much care, with the view of saving manual labor and perfecting the processes and results. Fully to appreciate the various processes of modern milling, it is necessary to bear in mind, not only that the wheat as delivered at the mill is dusty and mixed with sand and other refuse, but that it contains many light grains and seeds of foreign substances, which might be deleterious, and would certainly interfere with the appearance of the finished flour. Again, the structure of the wheat grain itself must not be overlooked. A grain (caryopsis) of wheat is not a seed, but a fruit consisting of a pericarp or outer envelope tightly adherent to its contained single seed. The envelope consists of several layers of ligneous tissue, within which are the embryo and a peculiar fermentive nitrogenous principle termed cerealin, and finally a central mass of thin cells filled with a white powdery substance largely composed of starch granules. The object of ordinary milling is to grind as perfectly as possible, without breaking the minute granules, the central substance of the grain, and to separate it from the embryo and outer husks, the former constituting the flour, and the latter the bran of the miller. Whole wheaten flour, on the other hand, consists of the entire grain ground up to a uniform mass.

The machines and processes by which flour is prepared are very numerous, and are diverse in character; and it must further be said that, at the present moment, the whole industry is in a peculiarly unsettled and transition state. The system which has prevailed in the United Kingdom hitherto is what is known as ordinary or flat grinding with millstones; but in the mean time a strong tendency is developing in favor of the use, either partially or entirely, of granulating or "high milling," and of some of the various systems of roller grinding which have been introduced. In Hungary and Austria the system of high milling prevails, in which the action of the millstones consists more in granulating than grinding; and in connection with that system of milling, the use of rollers is a prominent feature. To a limited extent also the principle of the disintegrator has been brought into operation, in which the grain is broken by the violent impact of studs or projections revolving in opposite directions with enormous velocity. Thus we have these various systems:—(1) flat milling or grinding; (2) high milling or granulation; (3) roller milling or crushing; and (4) disintegrator milling or breaking.

Flat or Ordinary Milling.—In the ordinary or flat millstone milling of the United Kingdom there are three main points to consider—(1) the cleaning and preparation of the wheat; (2) the grinding; and (3) the bolting or dressing of the ground products. The ordinary cleaning or screening apparatus through which the wheat, as received, passes, consists of a kind of cylindrical sieve of wire cloth, mounted in a sloping position, and having internal partitions so as to resemble an Archimedean screw. When the apparatus is set in motion, the grain, fed in at its upper end, tumbles from one division into another, thereby being freed from small refuse and sand, and as it issues at the lower extremity is subjected to a fan blast. For cleaning grain there are other kinds of apparatus, in which the principle of aspiration, or drawing currents of air through the grain, is now extensively employed, the most frequently used being Child's aspirator. A further cleaning is sometimes given by Child's decorticator, an implement which can be adjusted at will, for simply rubbing and scouring the grain, or for removing the thin bran and germ previous to the operation of grinding. The "Victor" brush machine is a recently introduced and highly approved apparatus for polishing and finishing wheat, its peculiar feature being that the "opposed brushes are constructed and worked in such a manner that they come in contact with every kernel of wheat in every conceivable position, and with as much force as the miller chooses to use—thus polishing it on the ends better than any other machine can do, and this not only on one pair of brushes, but on several." The prepared grain is next conveyed to the grinding apparatus, and here it may be said that, in moving the grain or flour horizontally, Archimedean screws working within an inclosed casing are employed, while in lifting from one floor to another, small boxes mounted on an endless band worked over pulleys and similarly encased are used. The grinding machinery consists first of a bin containing the grain to be ground, from which it passes by a spout to the hopper, whence it is delivered by a feeding adjustment to the stones. These constitute the distinctive feature of the entire mill.

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[1] *Leges Ethelberti*, apud Wilkins.

and upon their condition and delicate adjustment the whole success of the milling operation turns. They consist of two flat cylindrical masses inclosed within a wooden or sheet metal case, the lower or "bed-stone" being permanently fixed, while the upper or "runner" is accurately pivoted and balanced over it. The average size of millstones is about 4 feet 2 inches in diameter by 12 inches in thickness; and they are made of a hard but cellular siliceous stone called buhr-stone, the best qualities of which are obtained from La-Ferté-sous-Jouarre, department of Seine-et-Marne, France. Millstones are generally built up of segments, bound together around the circumference by an iron hoop, and backed with plaster of Paris. The bedstone is dressed to a perfectly flat plane surface, and a series of grooves or shallow depressions are cut in it, generally in the manner shown in fig. 5, which represents the grinding surface of an upper or runner stone. The grooves on both are made to correspond exactly, so that when the one is rotated over the other the sharp edges of the grooves, meeting each other, operate like a rough pair of scissors, and thus the effect of the stones on grain submitted to their action is at once that of cutting, squeezing, and crushing. The dressing and grooving of millstones are generally done by hand-picking, but sometimes black amorphous diamonds (carbonado) are used, and emery wheel dressers have likewise been suggested. The upper stone or runner is set in motion by a spindle on which it is mounted, which passes up through the centre of the bedstone, and there are screws and other appliances for adjusting and balancing the stone. Further, provision is made within the stone case for passing through air to prevent too high a heat being developed in the grinding operation; and sweepers for conveying the flour to the meal spout are also provided. The ground meal delivered by the spout is carried forward in a conveyer or creeper box, by means of an Archimedean screw, to the elevators, by which it is lifted to an upper floor to the bolting or flour-dressing machine. The form in which this apparatus was formerly employed consisted of a cylinder mounted on an inclined plane, and covered externally with wire cloth of different degrees of fineness, the finest being at the upper part of the cylinder where the meal is admitted. Within the cylinder, which was stationary, a circular brush revolved, by which the meal was pressed against the wire cloth, and at the same time carried gradually towards the lower extremity, sifting out as it proceeded the mill products into different grades of fineness, and finally delivering the coarse bran at the extremity of the cylinder. For the operation of bolting or dressing, hexagonal or octagonal cylinders, about 3 feet in diameter and from 20 to 25 feet long, are now commonly employed. These are mounted horizontally on a spindle for revolving, and externally they are covered with silk of different degrees of fineness, whence they are called "silks" or silk dressers. Radiating arms or other devices for carrying the meal gradually forward as the apparatus revolves are fixed within the cylinders, and there is also an arrangement of beaters which gives the segments of cloth a sharp tap, and thereby facilitates the sifting action of the apparatus. Like all other mill machines, the modifications of the silk dresser are numerous. Mill products are differently assorted and classified in various localities and different mills—some distinguishing many qualities of flour and bran, and others making only three or four divisions. The following (from Professor Church's *Food*) may be taken as a fair average representation of the product of 100 lb of good white wheat:—

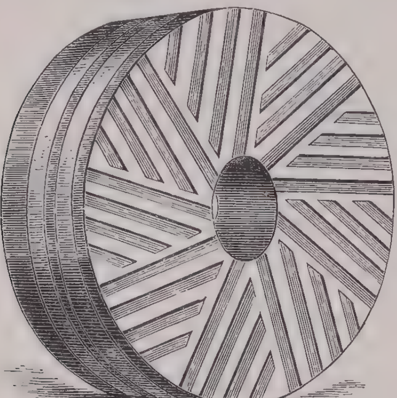

FIG. 5.—Upper Millstone, lower surface.

Flour........	1. Finest flour........................	42 lb.
	2. Seconds flour........................	18 "
	3. Biscuit flour........................	9 "
	4. Tails or tailings........................	3 "
Middlings	5. Middlings or fine sharps.........	8 "
Bran	6. Coarse sharps........................	3 "
	7. Fine pollard........................	3 "
	8. Coarse pollard........................	6 "
	9. Long bran........................	3 "
	Loss by evaporation, etc.............	5 "

In the Crown Mills, Glasgow, belonging to John Ure & Son, the classification and general average mill products, dealing with 50 qrs., are as follows:—

Flour....................................	60	to	62	bags of	280	lb.
Overheads or coarse flour............	2½	"	3	"	280	"
Fine thirds..............................	5	"	6	"	168	"
Thirds....................................	10			"	168	"
Bran.......................................	20	"	22	"	112	"
Light wheat..............................	1	"	2	"	240	"
Loss.......................................	14	"	18	lb per quarter.		

An additional proportion of fine flour is obtained by dressing and remilling tailings and middlings, and the purification and regrinding of these products have now become of much consequence in connection with the changed systems of milling rapidly coming into use. A great variety of middlings purifying machines have been introduced and eagerly pushed within the last few years, showing that this branch of economic milling is now receiving great attention.

The Hungarian System or High Milling.—The object of the low or flat milling process, as practised in Great Britain, is to produce at one grinding operation as large a proportion of good finished flour as possible. In high milling, on the other hand, the stones are kept so far apart that grain is merely bruised in the first operation, and by a series of such grindings or bruisings, alternated with elaborate sifting, the bran and all the outer envelopes with the cerealin are detached, and a nucleus of very pure semolina only left. In this way a large proportion of very inferior branny flour is obtained in these early millings, and the proportion of exceedingly fine strong flour for which Austro-Hungarian millers are famous is comparatively small. It is only to the hard brittle wheats that the Hungarian system of milling is applicable, and the method is only practicable under circumstances where there is a demand for the two extreme qualities of mill product which result from the system. Within the last few years the Hungarian millers have very largely adopted the roller mills, either to supplant entirely or to supplement the stone grinding.

Roller Mills.—In this form of mill a pair of horizontal rollers rotate face to face, and the grain or other material is submitted to their action by passing between them. The nature of that action varies according to the modification of roller surfaces, the closeness of the rollers to each other, and the equal or differential rate at which they revolve. Rollers of metal, either steel or chilled iron, having a toothed surface, revolving at different rates of speed and at definite distances apart, have a cutting action on the grain submitted to them. Such rollers are employed in the Buchholz system for reducing hulled wheat to the condition of semolina, and a similar arrangement is employed in the machine of Ganz & Co. of Buda-Pesth. Fig. 6 shows a section of the face of a pair of such rollers, where B revolving slowly serves as a holder for the grain, which is cut by the sharp edges of A, revolving at a speed three times greater than B. Smooth surface rollers are mounted to press hard against each other, and are made in some cases of polished chilled metal; and in other instances cylinders of porcelain are employed. Their principal function is for the reduction of purified middlings and semolina, and when no differential motion is given the action is simply that of squeezing, but when the opposing rollers revolve at different rates of speed a grinding effect is further superadded. A roller mill which has met great and sudden public acceptance is that invented and patented by F. Wegmann, a miller of Naples. In Wegmann's mill, fig. 7, porcelain rollers are employed, there being two pairs fed from opposite ends of one hopper in the machine figured. This machine possesses a self-acting pressure and a differential motion; but its most valuable feature consists in the employment of porcelain for rollers, by which a surface at once exceedingly hard and slightly rough or porous is secured. It is claimed for these rollers that, acting on middlings, they produce, with less expenditure of power, more and better flour than can be obtained by either stones or metal rollers. For the grinding of fine middlings English experience is, however, in favor of chilled iron rollers as the best. The roller mills have not yet been long enough in operation in Great Britain to enable any safe conclusion to be drawn as to their adaptability to British milling; but though the system originated only within the last few years, it has in the mean time practically superseded all other methods in the Austro-Hungarian districts, where milling is carried to greater perfection than in any other part of the world. To show the progress made in the introduction of roller mills in Britain, it may be noted that, while in January, 1877, there was only one Wegmann's machine in operation, there were by the close of the year 350 in various mills throughout the country.

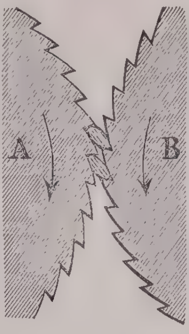

Fig. 6.—Section of Toothed Rollers.

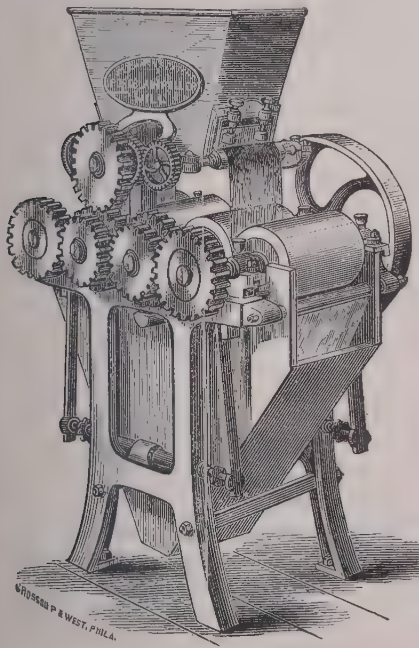
CROSSCUP & WEST, PHILA.

Fig. 7.—Wegmann's Roller-Mill.

The Disintegrator.—Under this name a form of machine was invented and introduced a few years ago by the late Thomas Carr for, among other purposes, the manufacture of flour. Carr's disintegrator consists of a pair of circular discs of metal set face to face, and studded with circles of projecting bars so arranged that the circles of bars on the one disc alternate with those of the other. The discs are mounted on the same centre, and so closely set to each other that the projecting bars of the one disc come quite close to the plane surface of the other; and they are inclosed within an external casing into the centre of which a spout passes by which the grain is delivered into the machine. The discs are caused to rotate in opposite directions with great rapidity, making about 400 revolutions per minute, and as the outer circle of bars is 6 feet 10 inches from the centre, they move at a rate of 140 feet a second, or about 100 miles per hour. The grain in passing through the machine is struck by the oppositely revolving studs with enormous force,—a force which increases as the shattered grains approach the outer circles of studs, and it is almost instantaneously reduced to a powder which falls under the discs and is carried away by a spiral creeper. It is stated that one of these machines 7 feet in diameter is capable of doing the work of as many as 27 pairs of millstones, and they have been fully tested in the flour mills of Gibson and Walker, Bonnington, near Edinburgh, where two of them have been in operation for a period of seven years. Notwithstanding this success, however, the disintegrator has not met with general acceptance as a flour mill, having been introduced into only a very limited number of establishments. The following is a statement of the average results Messrs. Gibson and Walker have obtained by the disintegrator from old Scotch wheat and from a mixture of Baltic and Ghirka wheats respectively:—

	Old Scotch.		*Baltic and Ghirka.*	
Flour	45	per cent.	35	per cent.
Semolina	26	"	36	"
Bran flour	4½	"	4½	"
Exhaust flour	1½	"	1¼	"
Seconds	4	"	3¾	"
Parings	1¾	"	2	"
Bran	13	"	13	"
Black dust, etc.	2¾	"	3	"
Loss	1½	"	1½	"
	100		100	

The semolina is reground under stones, and yields a fine strong flour; but it may be and sometimes is reduced by passing it again through the disintegrator.

Qualities of Flour.—There appears to be at present some conflict between public demand, as indicated by the increasing attention paid to the production of a fine strong white flour, and the current of scientific opinion expressed, though with some hesitation and doubt, in favor of whole meal or flour in which the richly nitrogenous outer portions of the wheat are retained. The fact that the outer portions of the wheat are richest in nitrogenous principle, and that also in a peculiarly active form, is indisputable; but it has not been satisfactorily determined whether the nutritive value of that portion of the grain is exactly measured by its chemical composition. The condition of the nitrogenous substance, the amount and irritating nature of the ligneous tissue which accompanies it, and its peculiar influence on the other constituents of the wheat grain may and probably do affect its value. It is certain also that white flour is deliberately preferred by the laboring population, whose instinct is probably right, and it is also preferred by and for many purposes indispensable to the baker and cook. Good flour should present the appearance of a pure uniform white powder, only faintly tinged with yellow, free from all grit and lumps; and when pressed in the hands it ought to show a certain amount of adhesiveness. It should be free from all smell of damp or mouldiness, and it should have no acidity of taste. For the purposes of the baker its strength is measured by the amount and quality of its gluten or nitrogenous constituents, which may be roughly estimated by making up a little dough and observing its tenacity when drawn out; but a more accurate means of measuring its elasticity is provided by the aleurometer of M. Boland, a Parisian baker. The following analytical statement of the constituents of flour, and other calculations concerned therewith, are extracted from Professor Church's *Handbook of Food*, prepared for the Science and Art Department:—

Composition of Fine Flour from White Soft Wheat.

	In 100 parts.	In 1 lb.			
Water.	13·0	2	oz.	35	grs.
Fibrin, etc.	10·5	1	"	297	"
Starch, etc.	74·3	11	"	388	"
Fat	0·8	0	"	57	"
Cellulose	0·7	0	"	44	"
Mineral matter	0·7	0	"	49	"

"One pound of good wheaten flour, when digested and oxidized in the body, might liberate force equal to 2283 tons raised one foot high. The greatest amount of external work which it could enable a man to perform is 477 tons raised one foot high. For one part of flesh-formers in fine wheaten flour there are 7¼ parts of heat-givers reckoned as starch. One pound of wheaten flour cannot produce more than about 1⅔ oz. of the dry nitrogenous substance of muscle or flesh."

Statistics of the Flour Trade.—The disproportion between the grain producing and consuming capacity of the United Kingdom is very great and yearly increasing, and the deficiency in our own crops is made good from almost all quarters of the globe. In the discussion of this principal portion of the British food supply, the whole grain crops of the kingdom and the entire imports of all kinds of grain would require to be taken into consideration, and this large question cannot be here entered upon. The extent of our import trade in wheat and flour is indicated by the following table, relating to the five years 1872–6; and the detailed statement for 1876 gives the principal sources whence these supplies are drawn:—

Total Imports of Wheat and Flour, 1872–1876.

Year.	Wheat.		Wheat Meal and Flour.	
	Cwt.	Value.	Cwt.	Value.
1872	42,127,726	£26,169,185	4,388,136	£4,087,639
1873	43,863,098	28,538,746	6,214,479	5,849,852
1874	41,527,638	25,236,932	6,236,044	5,685,076
1875	51,876,517	27,510,469	6,136,083	4,870,257
1876	44,454,657	23,178,011	5,959,821	4,741,515

Country.	Wheat.		Wheat Meal and Flour.	
	Cwt.	Value.	Cwt.	Value.
Austrian territories.........	....	....	445,626	£487,163
Russia—				
Northern ports............	1,977,346	£1,000,226	104,928	96,459
Southern ports............	6,803,282	3,403,375		
Sweden	58,411	30,511		
Denmark.........................	263,205	146,416	471,060	366,011
Germany.........................	2,324,148	1,331,521	930,819	769,074
Holland.........................	81,071	42,898		
France	292,050	158,439	1,089,400	888,867
Spain	243,744	138,542		
Italy.........................	215,735	117,789		
Turkey	862,884	399,596		
Wallachia and Moldavia...	379,079	168,558		
Egypt.........................	2,223,238	955,615	20,811	13,306
United States—				
On the Atlantic............	12,737,096	6,583,563	1,895,011	1,351,754
On the Pacific............	6.585,958	3,730,810	425,218	351,532
Chili.........................	982,379	511,640	24,211	19,567
British India—				
Bombay and Scinde......	932,084	482,921		
Bengal and Burmah......	2,355,152	1.163,706		
Australia.........................	2,605,550	1,473,749	189,320	131,431
British North America.....	2,423,183	1,281,555	283,034	201,514
Other countries...............	109,062	56,581	80,333	64,837
Total.........................	44,454,657	23,178,011	5,959,821	4,741,515

Sources, Quantities, and Value of Imports of Wheat and Flour into Great Britain in 1876.

The subjoined extract from the London *Corn Exchange Report* for 4th March, 1878, will suffice to show the market classification of flour, and give an approximately accurate idea of the relative value of the various descriptions:—

London, top-price brands..................	sk. of 280 lb.	47s. to 50s.
" usual households..............................		39s. " 41s.
" " seconds..............................		37s. " 38s.
" cheap households..............................		36s. " 38s.
Cones, from Rivetts..............................		34s. " 36s.
" " Rice..............................		30s. " 33s.
Country households, Norfolk..............................		35s. " 37s.
Herts, Essex, and Suffolk..............................		36s. " 38s.
Surrey, Kent, and Sussex..............................		36s. " 38s.
American—Extra State	barrel of 196 lb.	25s. 6d. 28s.
Canadian, fine..............................		27s. to 30s.
Patent process, extra fine..............................		30s. " 36s.
Sour and stale..............................		... " ...
Value of empty barrels......		10d. " 1s.
French—Gruaux, for pastry..............	280 lb.	48s. " 54s.
Superior Paris marks..............................		45s. " 46s.
Eight marks, Paris..............................		47s. " 48s.
Darblay, A..............................		... " 49s.
" B..............................		... " 44s.
" No. 2..............................		... " 41s.
Spanish—1st quality..............................		43s. " 46s.
Baltic—Whites, gold medal..		42s. " 44s.
" Marked 000..............................		41s. " 43s.
Odessa..............................	280 lb., No. 1	44s. to 47s.
Hungarian—P. W. M., 000..............................		60s. " ...
" Queen's C.D. / P.		57s. " 58s.
" Victoria Empress..............................		58s. " 59s.
" 5 Roses..............................		56s. " 57s.
" 5 Crowns		56s. " 57s.
" 5 A's..............................		56s. " 57s.
Australian—Superfine..............................		43s. " 45s.
" Fine..............................		39s. " 41s.
" Household.		37s. " 39s.

(J. PA.)

FLOURENS, GUSTAVE (1838–1871), a French social democrat and writer, a son of M. J. P. Flourens, was born at Paris, August 4, 1838. Before he had attained his twenty-first year he obtained at the college of Louis-le Grand the diplomas of licentiate in letters and in sciences. In 1863 he undertook for his father a course of lectures at the Collége de France, the subject of which was the history of mankind. His theories as to the manifold origin of the human race, however, gave offence to the clergy, and he was precluded from delivering a second course. He then repaired to Brussels, where he published his lectures under the title of *Histoire de l'Homme;* he next visited Constantinople and Athens, took part in the Cretan insurrection of 1866, spent some time in Italy, where an article of his in the *Popolo d'Italia* caused his arrest and imprisonment, and finally, having returned to France, nearly lost his life in a duel with Paul de Cassagnac, editor of the *Pays*. In Paris he devoted his pen to the cause of republicanism, and at length, having failed in an attempt to organize a revolution at Belleville, February 7, 1870, found himself compelled to flee from France. Returning to Paris on the downfall of Napoleon, he soon placed himself at the head of a body of 500 tirailleurs. On account of his insurrectionary proceedings he was taken prisoner at Créteil, near Vincennes, by the provisional government, and confined at Mazas, December 7, 1870, but was released by his men on the night of January 21–22. On the 18th March he joined the Communists. As colonel of the 19th and 20th arrondissements he took part in an attack on Versailles, and early in the morning of the 3d of April was killed in a hand-to-hand conflict at Rueil, near Malmaison. Besides his *Science de l'Homme* (Paris, 1869), Gustave Flourens was the author of numerous fugitive pamphlets.

FLOURENS, MARIE JEAN PIERRE (1794–1867), a celebrated French physiologist, was born at Maureilhan, near Béziers, in the department of Hérault, April 15, 1794. At the age of fifteen he began the study of medicine at Montpellier, where in 1823 he received the degree of doctor. In the following year he repaired to Paris, provided with an introduction from De Candolle, the botanist, to Cuvier, who received him kindly, and interested himself in his welfare. At Paris Flourens engaged in physiological research, occasionally contributing to literary publications; and in 1821, at the Athénée there, he gave a course of lectures on the physiological theory of the sensations, which attracted much attention amongst men of science. His paper entitled *Recherches expérimentales sur les propriétés et les fonctions du système nerveux dans les animaux vertébrés*, in which he, from experimental evidence, sought to assign their special functions to the cerebrum, corpora quadrigemina, and cerebellum, was the subject of a highly commendatory report by Cuvier, adopted by the French Academy of Sciences, July 22, 1822. He was chosen by Cuvier in 1828 to deliver for him a course of lectures on natural history at the Collége de France, and in the same year became, in succession to Bosc, a member of the Institute, in the division "Économie rurale." In 1830 he became Cuvier's substitute as lecturer on human anatomy at the Jardin du Roi, and in 1832 was elected to the post of titular professor, which he vacated for the professorship of comparative anatomy created for him at the museum of the Jardin the same year. In 1833 Flourens, in accordance with the dying request of Cuvier, was appointed a perpetual secretary of the Academy of Sciences; and in 1838 he was returned as a deputy for the arrondissement of Béziers. In 1840 he was elected, in preference to Victor Hugo, to succeed Michaud at the French Academy; and he was created on April 24, 1845, a commander of the legion of honor, and in the next year a peer of France. In March, 1847, Flourens directed the attention of the Academy of Sciences to the anæsthetic effect of chloroform on animals; and it is an interesting fact in the history of therapeutics that "chloric ether," a spirituous solution of chloroform, was in the spring of the same year first employed, at the suggestion of Dr. M. C. Furnell, in surgical operations at St. Bartholomew's Hospital. On the revolution of 1848, Flourens withdrew completely from the political world; and in 1855 he accepted the professorship of natural history at the Collége de France. Three years before his death, which took place at Montgeron near Paris, December 6, 1867, he retired from his active duties at the Academy of Sciences.

As an experimental physiologist Flourens holds the highest rank. Besides a multitude of shorter scientific memoirs, he published—*Essai sur quelques points de la doctrine de la révulsion et de la dérivation*, Montpellier, 1813; *Expériences sur le système nerveux*, Paris, 1825; *Cours sur la génération, l'ovologie, et l'embryologie*, 1836; *Analyse raisonée des travaux de G. Cuvier*, 1841; *Recherches sur le développement des os et des dents*, 1842; *Anatomie générale de la peau et des membranes muqueuses*, 1843; *Buffon, histoire de ses travaux et de ses idées*, 1844; *Fontenelle, ou de la philosophie moderne relativement aux sciences physiques*, 1847; *Théorie expérimentale de la formation des os*, 1847; *Œuvres complètes de Buffon*, 1853; *De la longévité humaine et de la quantité de vie sur le globe*, 1854, numerous eds.; *Histoire de la découverte de la circulation du sang*, 1854; *Cours de physiologie comparée*, 1856; *Recueil des éloges historiques*, 1856; *De la vie et de l'intelligence*, 1858; *De la raison, du génie, et de la folie*, 1861; *Ontologie naturelle*, 1861; *Examen du livre de M. Darwin sur l'Origine des Espèces*, 1864. For list of papers see Royal Society's *Catalogue*, vols. ii. and vii.

FLOWERS, Artificial. There are few branches of ornamental work used in the decoration of ladies' apparel which have more increased in importance than that of artificial flower making, in which, both in France and in England, large numbers of workpeople are engaged. Not only has the trade itself greatly extended within the last few years, but the improvement in the manufacture is very marked, and the bouquets and wreaths used in the trimming of dresses may be almost said to rival nature, so truly and delicately are the individual flowers manipulated. Artificial flower making is almost entirely done by hand, giving occupation principally to young women and children, the majority of whom work at home or in small shops. The numbers employed at the time of the census of 1871 were returned as 4886, of whom 1740 were under twenty years of age. In France the numbers are much larger, for ten years ago it was estimated that there were at least 2000 shops where artificial flowers were made, and it is probable that now these have been increased to 3000. It is not entirely a woman's work, however, for men are employed, particularly in Paris, in cutting out the material for the flowers by a stamp machine, in which 16 or 20 folds are operated upon at once, the folds being colored green, blue, crimson, according to the flower which is to be imitated. Each piece is taken up separately by a girl armed with a pair of pincers, who, with one dexterous movement, moulds it, as it were, roughly into the shape of the flower, and then passes it on to another, who gives a more precise form to the petal. A third girl attaches each petal to a very fine wire, thread having been previously twisted round this wire to form the stalk; while the remaining operations consist in goffering the petals and leaves to give them a curl, and finally gumming or waxing them over, or dusting them with fine powdered glass or potato flour to represent the bloom. The rapidity and accuracy with which these various processes are completed are very remarkable. A new style of artificial flower has lately come into vogue, in France more especially, made by the "enamel process," in which a young girl sits by a jet of flame, holding in her hand a stick of prepared glass. A momentary application to the flame makes the end of the stick red hot, and while it is still in a pasty state, the operator pulls out a short length, and immediately rolls it up into the form of the petal or leaf, and passes it on to the painter for the proper coloring. The remaining processes are similar to those of the ordinary artificial flowers. These enamel flowers, though wondrously true and pretty, are more suited for room decoration than for dress. While apparently a light and pleasant work, artificial flower making is not one of the healthiest of our trades, partly for the reason that it is so often carried on in small household shops, where ventilation is of the scantiest. It has, however, been much improved in this respect since it has come under the supervision of the Factory Acts. There is always a certain amount of dust and coloring matter flying about the room, which is more or less injurious, though the use of Scheele's green and sulphate of copper (verdigris blue) is almost discontinued, and with it a train of symptoms that usually accompany arsenical poisoning. Weak eyes are a common source of complaint, especially the form called asthenopia, which is particularly induced when white flowers are made by gas light. In the manufacture of the flowers, the net cost is about three-fifths of the whole for material, and the remaining two-fifths for the labor. In France the earnings of the men who cut the folds are from 4 to 5 francs per day, of the workwomen from 2½ to 3½, according to ability. In England a skilful flower worker will earn from 20s. to 25s. per week, though there is a drawback in its being a season trade, which is very brisk about the spring and fall of the year, and as inactive during the other times. Besides the very large number of artificial flowers made in England, the following table shows how great is the importation, principally from France:—

1866	£293,306	1870	£266,502	1874	£447,351
1867	304,440	1871	367,186	1875	510,800
1868	341,176	1872	411,540	1876	496,987
1869	365,407	1873	449,320	1878	544,625

Belgium and Holland likewise supply Great Britain but to a much smaller extent.

FLOYER, Sir John (1649–1734), M.D., physician and author, was born at Hinters in Staffordshire, and was educated at Oxford. He practised in Lichfield, and it was by his advice that Dr. Johnson, when a child, was taken by his mother to be touched by Queen Anne for the king's evil, March 30, 1714. Dr. Johnson had a high opinion of his learning and piety. Floyer died February 1, 1734. Besides letters and other short pieces in various publications, he wrote—

Φαρμακο-Βάσανος: *or the Touch-stone of Medicines, discovering the virtues of Vegetables, Minerals, and Animals, by their tastes and Smells*, 2 vols., 1687; *The præternatural State of animal Humors described by their sensible Qualities*, 1696; *An Enquiry into the right Use and Abuses of the hot, cold, and temperate Baths in England*, 1697; *A Treatise of the Asthma*, 1st ed., 1698; *The ancient Ψυχρο-λουσία revived, or an Essay to prove cold Bathing both safe and useful*, London, 1702 (several editions 8vo; abridged, Manchester, 1844, 12mo); *The Physician's Pulse-watch*, 1707–10; *The Sibylline Oracles, translated from the best Greek copies, and compared with the sacred Prophecies*, 1st ed., 1713; *Two Essays: the first Essay concerning the Creation, Ætherial Bodies, and Offices of good and bad Angels; the second Essay concerning the Mosaic System of the World*, Nottingham, 1717; *An Exposition of the Revelations*, 1719; *An Essay to restore the Dipping of Infants in their Baptism*, 1722; *Medicina Gerocomica, or the Galenic Art of preserving old Men's Healths*, 1st ed., 1724; *A Comment on forty-two Histories described by Hippocrates*, 1726.

FLUDD, Robert (Latin *Robertus De Fluctibus*), (1574–1637), an English physician and mystical philosopher, was the son of Sir Thomas Fludd, treasurer of war to Queen Elizabeth in France and the Low Countries, and was born at Milgate, Kent, in 1574. After studying at Oxford he spent six years in travelling in Europe. While on the Continent he became acquainted with the writings of Paracelsus, and he was so fascinated with them that he endeavored to form a system of philosophy founded on the identity of physical and spiritual truth. He believed in two universal principles, the northern or condensing and the southern or rarefying power, and in the existence of four elemental spirits corresponding to fire, air, earth, and water. The central principle of his philosophy was that man was a representation or miniature of the universe, and he endeavored to trace the analogy between what he called the microcosm and the macrocosm. The opinions of Fludd, preposterous as they now seem, had the honor of being refuted by Kepler, Gassendi, and Mersenne. Though rapt in mystical speculation, Fludd did not disdain scientific experiments, and is thought by some to be the original inventor of the barometer. He died in 1637. De Quincey considers Fludd to have been the immediate father of freemasonry, as Andrea was its remote father.

Fludd wrote two books against Mersenne, the first entitled *Sophiæ cum Moria Certamen*, etc., 1629; and the second, *Summum Bonorum quod est verum Magiæ, Cabalæ*, etc., 1629. Among his other works were—*Utriusque Cosmi, majoris et minoris, Technica Historia*, 1617; *Tractatus Apologeticus integritatem Soc. de Rosea Cruce defendens*, 1617; *Monochordon Mundi symphoniacum, seu Replicatio ad Apologiam Joannis Kepleri*, 1620; *Anatomiæ Theatrum triplici effigie designatum*, 1623; *Philo-*

sophia Sacra, 1626; *Medicina Catholica*, 1626; *Integrum Morborum Mysterium*, 1631; *De Morborum Signis*, 1631; *Clavis Philosophiæ et Alchymiæ Fluddianæ*, 1633; *Philosophia Mosaica*, 1638; and *Pathologia Dæmoniaca*, 1640. See De Quincey's Works, vol. xvi. pp. 406–412.

FLÜGEL, Gustav Lebrecht (1802–1870), a German Orientalist, was born at Bautzen, February 18, 1802. He received his early education at the gymnasium of his native town, and studied theology and philology at Leipsic. Gradually he devoted his attention chiefly to Oriental languages, which he studied especially at the universities of Vienna and Paris. In 1832 he became professor at the district school of Meissen, but ill health compelled him to resign that office in 1850, and in 1851 he went to Vienna, where he was employed in cataloguing the Oriental manuscripts of the court library. He died at Dresden, July 5, 1870.

His chief works are an edition of the *Koran*, originally published at Leipsic in 1834, followed by *Concordantiæ Corani Arabicæ*, Leipsic, 1842; *Geschichte der Araber*, Leipsic, 1832–1840; *Dictionary of Hadschi-Chalfa*, with Latin translation and commentary, in 7 vols., London and Leipsic, 1835–1858 (published at the expense of the London Oriental Translation Committee); *Mani, seine Lehren und seine Schriften*, Leipsic, 1862; *Die grammatischen Schulen der Araber*, Leipsic, 1862.—An edition of *Kitâb-al-Fihrist*, prepared by Flügel, was published posthumously at Leipsic in 1871, and he also edited various other Oriental works.

FLÜGEL, Johann Gottfried (1788–1855), a German lexicographer, was born at Barby near Magdeburg, 22d November, 1788. He was originally a merchant's clerk, but emigrating to America in 1810, he made a special study of the English language, and returning to Germany in 1819, he was in 1824 appointed professor of the English language in the university of Leipsic. In 1838 he became American consul, and subsequently representative and correspondent of many literary and scientific institutions of America. He died 24th June, 1855.

The fame of Flügel rests chiefly on his *Vollständige englisch-deutsche und deutsch-englische Wörterbuch*, first published in 2 vols. at Leipsic in 1830, which has had an extensive circulation not only in Germany but in England and America. Among his other works are—*Vollständige engl. Sprachlehre*; *Triglotte, oder Kaufmännisches Wörterbuch in drei Sprachen, deutsch, englisch, und französisch*; *Kleines Kaufmännisches Handwörterbuch in drei Sprachen*; and *Praktisches Handbuch der engl. Handelscorrespondenz*. All these have passed through several editions.

FLUORINE, one of the halogen group of chemical elements, symbol F, atomic weight 19·1. The compound fluorine forms with hydrogen, namely, hydrofluoric acid, or hydrogen fluoride, was known so long ago as 1670 for its property of etching glass; by Scheele it was regarded as a substance containing oxygen with some other element; and by Ampère, in 1810, it was shown to consist of hydrogen with a new element, which from its source fluor spar received the name of fluorine. Fluorine is one of the less abundant, but one of the most widely diffused of the elements. It occurs in nature always combined with other elements, as in fluor spar (see below), in Cryolite (*q.v*, vol. vi. p. 590), and in fluor-apatite; in the rarer minerals topaz, yttrocerite, wagnerite, wavellite, and others; also in small quantities in some granites and trap rocks; in river and mineral waters; and in sea water, according to Forchhammer, to the extent of half a grain in 100 ℔. Bischoff draws attention to the fact that no trace of fluorine is to be found in augite. It is a constant constituent of teeth and bones—in fossil in larger quantity than in recent bones; and it has been detected in corals, and in the ashes of milk and of ox-blood. Attempts to isolate fluorine have been made by several experimenters, but its strongly negative properties, by occasioning its combination with the material of most vessels employed to receive it, have hitherto proved an obstacle to its investigation in the free state. The presence of fluorine in minerals is usually detected by their evolution of hydrofluoric acid when heated with sulphuric acid, and the action of the evolved acid on glass. For the quantitative estimation of fluorine, its compounds may be decomposed by means of sulphuric acid or acid sulphate of ammonium, the fluorine being determined either by loss, or directly in the form of silicofluoride of potassium, sodium, or barium, according to Wöhler's method. To obtain their fluorine in a soluble combination many minerals require fusion with alkaline carbonates. Free hydrofluoric acid and soluble fluorides are best determined by means of calcium chloride, which affords a precipitate of calcium fluoride, or fluor spar. See further, on the compounds of fluorine and their reactions, Chemistry, vol. v. pp. 424–428.

FLUOR SPAR, Fluorite, or Calcium Fluoride, CaF_2 (Germ. *Fluss-spath*), the "blue John" of Derbyshire, and "cann" or "kann" of Cornish miners, occurs crystallized in simple or modified cubes and octahedrons; also nodular, compact and granular, and more rarely fibrous, or soft and earthy. Some octahedral crystals from the mines of St. Agnes, in Cornwall, are made up of minute cubes, which may themselves show faces of other forms of the monometric system of crystallography. Fluor spar is a brittle, transparent to sub-translucent mineral, with a perfect octahedral cleavage, a vitreous, sometimes splendent lustre, a hardness of 4, and a specific gravity of 3·01–3·25. Before the blowpipe it decrepitates, tinges the flame dull red, and fuses into an enamel. Heated with concentrated sulphuric acid it yields hydrofluoric acid (see Chemistry, vol. v. p. 425). In color fluor spar varies much, being blue, purple, green, yellow, pink, or brown; it is sometimes dichroic. The colors are attributed by Wyrouboff to the presence of minute quantities of hydrocarbons, taken up from solutions from which the mineral has crystallized; by others they are considered to be due to peculiarities of molecular structure. In the Weardale fluors small cavities containing liquid have occasionally been found. Fluor spar, in common with some other substances, when exposed to light, or when raised to a temperature somewhat under redness, usually phosphoresces, emitting a bright light, the color of which is not dependent on that of the mineral. A variety of fluor spar has received its name chlorophane from its fine green phosphorescence. Like the color, the phosphorescence of fluor-spar is destroyed by exposure to a high temperature; it may be partly restored by means of an electric discharge, or, it is said, by moistening with dilute hydrofluoric acid. From the name of the mineral Professor Stokes borrowed the term "fluorescence," applied by him to the quality which certain bodies, *e.g.*, sulphate of quinine, possess of rendering the ultra-violet rays of the spectrum visible. W. Hankel (*Ann. Phys. Chem.* [2], ii. 66–83), experimenting on crystals of fluor spar from Weardale, found that when exposed to light they exhibited not only phosphorescence but electrical phenomena; the rays of the sun, however, concentrated by a lens, deprived the crystals of their photo-electrical property, which they did not regain. Fluor spar is slightly soluble in water containing hydrated calcium carbonate. Pseudomorphs of hornstone, hematite, calamine, and other minerals after fluor spar are not unfrequent. Fluor spar is commonly used for the production of hydrofluoric acid in etching on seals and glass, and in the smelting of lead and copper and in other metallurgical operations as a flux, whence its name, from the Latin *fluo*, to flow. The manufacture of vases and other ornamental articles from fluor spar, especially the variegated varieties, has long been carried on in Derbyshire. The stone, which is sometimes first heated to change its blue to an amethystine tint, is shaped by means of the lathe and a fine steel tool, and is finished off with coarse stone, and after that with pumice and emery. Fluor spar is of frequent occurrence in metalliferous veins, being most commonly associated with ores of lead, as in the mines of Derbyshire, Cumberland, Cornwall, Saxony, and Bohemia. It is met with also in granite, gneiss, slates, various limestones and sandstones, and some volcanic products, and has occasionally been detected in beds of coal.

On the phosphorescence of fluor spar see Prof. C. Bohn's paper on "Negative Fluorescence and Phosphorescence," *Phil. Mag.* [4], vol. xxxiv. p. 109, 1867.

FLUSHING (Dutch *Vlissingen*), a fortified seaport town of the province of Zealand, Holland, is situated on the island of Walcheren, at the mouth of the estuary of the Western Scheldt, about 4 miles S. of Middleburg, and 50 miles S.W. of Rotterdam. It possesses an academy of sciences, a school of navigation, a town-hall, a theatre, an exchange, and a statue to Admiral Ruyter, who was born here in 1607. Since 1872 it has had direct railway connection with the main lines of Europe; and by the construction in 1873 of a great harbor, docks, and canal works a communication between it and the North Sea has been opened up for vessels of the largest size. The outer harbor has a surface of 33·11 acres, and a depth at low water of 22 feet; the depth of both the inner harbors at low water is 27 feet, the surface of the one being 16·55 acres and that of the other 11·86 acres. With these works Flushing possesses one of the finest and safest harbors of the Continent, and the one on the Dutch coast best adapted for the trade of Holland and Germany. Its chief exports are wheat, beans, fish (especially shrimps), and cattle; and its chief imports coal from England, and coffee, tea, and tin from Java. The number of vessels entering and clearing annually is upwards of 100. Besides the shipping trade the chief industries are brewing and the manufacture of oil and soap. Flushing was one of the "cautionary towns" delivered up to Queen Elizabeth in 1585 in security for the money and soldiers sent by her to assist the Dutch under Sir Philip Sidney. It was captured by the French in 1795, and in 1809 it was bombarded by the English under Lord Chatham, and did not surrender till the fine town-hall, two churches, and about 100 houses were destroyed. Its fortifications have since that time been greatly strengthened, and now completely command the entrance to the river. Population in 1869, 8929.

FLUSHING, a post-village of Queens county, New York, is situated on Long Island at the head of Flushing Bay, about 7 miles N.E. of New York, and 8 N.E. of Brooklyn. It possesses a State bank, a savings bank, an academy, a female seminary, and several other educational institutions. It is the residence of many of the New York merchants, and is noted for its large gardens and nurseries. Population in 1870, 6223.

FLUTE, a wind instrument which in a variety of forms has been in constant use from the earliest ages. To Olympus the Phrygian has been ascribed the introduction of flute-playing into Greece, an art which was much encouraged in the later days of the empire. The Greeks employed professional flute-players in many of their religious ceremonies, and competitive trials of skill were frequent. The old English flute, called the *flute-à-bec*, from the supposed resemblance of the mouthpiece to the beak of a bird, was played from the upper and wider end, had seven finger holes, and was made of various sizes, called treble, alto, tenor, and bass flutes respectively. This instrument continued in common use to about the middle of the 18th century, when it was gradually superseded by the modern horizontal (*flauto traverso*) or "German" flute. Handel was one of the first to introduce the new instrument into the orchestra, employing it for solos in *The Ode on Saint Cecilia's Day* (1739), notably in the air "The soft complaining Flute." But the capacities of the *traverso* of Handel's time were very limited in comparison with those of its modern representative, which possesses a workable compass of about three octaves from the low C in the treble clef, with all the chromatic intervals. Various systems of fingering have been introduced from time to time by the most eminent flautists and flute-makers, and concertos for the flute as a solo instrument have been composed with a view to exhibiting the powers of celebrated performers. In orchestral scores the flute part is generally placed at the top, and is written in the violin or G clef. The *piccolo* or octave flute, the E flat or *tierce*, the D flat or *minor ninth* (transposing piccolo), the *flute d'amour*, a minor third below the ordinary instrument—are all varieties of the *traverso*, which like the fife is blown by an oval shaped hole in the side, near the stopped end of the tube. Other branches, now obsolete, of the flute family were—the *recorder*, varying in length of tube from about twelve inches to three feet, the largest being known as the *bass recorder;* the *cornet*, shaped like a quadrant, and gradually tapering towards the mouthpiece; and the *pilgrim's staff*, having a tube about six feet in length. For other less important varieties the reader is referred to *Musurgia*, Luscinius, 1536; *Harmonie Universelle*, Mersenne, 1636. Among the foundation stops of most organs will generally be found one or more "flute" stops *e.g.*, the *hohl flöte*, of eight feet tone, and the octavo flute, of four feet tone. The flageolet is a smaller variety of the old *flute-à-bec*, and was formerly used in the orchestra. Handel has written an *obbligato* part for it in the well-known barytone air "O, ruddier than the cherry." The fife, much used in military bands, is simply an octave flute in D, played horizontally, and having six finger holes and one key.

FLUX. See METALLURGY.

FLUXIONS. See INFINITESIMAL CALCULUS.

FLY. See DIPTERA and INSECTS.

FLYCATCHER, a name introduced in ornithology by Ray, being a translation of the *Muscicapa* of older authors, and applied by Pennant to an extremely common English bird, the *M. grisola* of Linnæus. It has since been used in a general and very vague way for a great many small birds from all parts of the world which have the habit of catching flies on the wing, and thus ornithologists who have trusted too much to this characteristic and to certain merely superficial correlations of structure, especially those exhibited by a broad and rather flat bill and a gape beset by strong hairs or bristles, have associated under the title of *Muscicapidæ* an exceedingly heterogeneous assemblage of forms that, though much reduced in number by later systematists, has scarcely yet been sufficiently revised. Great advance has been made, however, in establishing as independent Families the *Todidæ* and *Eurylæmidæ*, as well as in excluding from it various members of the *Ampelidæ*, *Cotingidæ*, *Tyrannidæ*, *Vireonidæ*, *Mniotiltidæ*, and perhaps others, which had been placed within its limits. These steps have left the *Muscicapidæ* a purely Old-World family of the Order *Passeres*, and the chief difficulty now seems to lie in separating it from the *Campephagidæ* and the *Laniidæ*. Every ornithologist must own that its precise definition is at present almost impossible, and must await that truer knowledge which comes of investigating structural characters more deeply seated than any afforded by the epidermis. But here want of space forbids the pursuit of this kind of inquiry, and for the same reason only a very few of the forms of Flycatchers (which, after all the deductions above mentioned, may be reckoned to include some 60 genera or subgenera, and perhaps 250 species) can be even named.[1]

The best known bird of this Family is that which also happens to be the type of the Linnæan genus *Muscicapa*—the Spotted or Gray Flycatcher (*M. grisola*) already mentioned. It is a common summer visitant to nearly the whole of Europe, and is found throughout Great Britain, though less abundant in Scotland than in England, as well as in many parts of Ireland, where, however, it seems to be but locally and sparingly distributed. It is one of the latest of our migrants to arrive, and seldom reaches these islands till the latter part of May, when it may be seen, a small dust-colored bird, sitting on the posts or railings of our gardens and fields, ever and anon springing into the air, seizing with an audible snap of its bill some passing insect as it flies, and returning to the spot it has quitted, or taking up some similar station to keep watch as before. It has no song, but merely a plaintive or peevish call-note, uttered from time to time with a jerking gesture of the wings and tail. It makes a neat nest, built among the small twigs which sprout from the bole of a large tree, fixed in the branches of some plant trained against a wall, or placed in any hole of the wall itself that may be left by the falling of a brick or stone. The eggs are from four to six in number, of a pale greenish-blue, closely blotched or freckled with rust-color. Silent and inconspicuous as is this bird, its constant pursuit of flies in the closest vicinity of our houses makes it a familiar object to almost everybody. A second British species is the Pied Flycatcher (*M. atricapilla*)—called by some writers the Coldfinch—a much rarer bird, and in England not often seen except in the hilly country extending from the Peak of Derbyshire to Cumberland, and more numerous in the lake district than elsewhere. It is not common in Scotland, and has only once been observed in Ireland. More of a woodland bird than the former, the brightly-contrasted black and white plumage of the cock, together with his agreeable song, readily attracts attention where it occurs. It is a summer visitant to all Western Europe, but further eastward its place is taken by a nearly allied species (*M. collaris*) in which the white of the throat and breast extends like a collar round the neck. A fourth European species (*M. parva*), distinguished by its very small size and red breast, has also strayed some three or four times to the extreme south-west of England. This last belongs to a group of more eastern range, which has received generic recognition (possibly well deserved) under the name of *Erythrosterna*, and it has several relations in Asia and particularly in India, while the allies of the Pied Flycatchers (*Ficēdula* of Brisson) are chiefly of African origin, and those of the Gray or Spotted Flycatcher (*Muscicapa* proper[1]) are common to the two continents.

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[1] Of the 30 genera or subgenera which Swainson included in his *Natural Arrangement and Relations of the Family of Flycatchers* (published in 1838), at least 19 do not belong to the *Muscicapidæ* at all, and one of them. *Todus*, not even to the Order *Passeres*. It is perhaps impossible to name any ornithological work whose substance so fully belies its title as does this treatise. Swainson wrote it filled with faith in the so-called "Quinary System"—that fanciful theory, invented by Macleay, which misled and hindered so many of the best English zoologists of his generation from the truth,—and, unconsciously swayed by his bias, his judgment was warped to fit his hypothesis.

One of the most remarkable groups of *Muscicapidæ* is that known as the Paradise Flycatchers, forming the genus *Tchitrea* of Lesson. In nearly all the species the males are distinguished by the growth of exceedingly long feathers in their tail, and by their putting on, for some part of the year at least, a plumage generally white, but almost always quite different from that worn by the females, which is of a more or less deep chestnut or bay color, though in both sexes the crown is of a glossy steel-blue. They are found pretty well throughout Africa and tropical Asia to Japan, and seem to affect the deep shade of forests rather than the open country. The best-known species is perhaps the Indian *T. paradisi;* but the Chinese *T. incii*, and the Japanese *T. princeps*, from being very commonly represented by the artists of those nations on screens, fans, and the like, are hardly less so; and the cock of the last named, with his bill of a pale greenish-blue and eyes surrounded by bare skin of the same color—though these are characters possessed in some degree by all the species—seems to be the most beautiful of the genus. *T. bourbonnensis*, which is peculiar to the islands of Mauritius and Réunion, appears to be the only species in which the outward difference of the sexes is but slight. In *T. corvina* of the Seychelles, the adult male is wholly black, and his middle tail-feathers are not only very long but very broad. In *T. mutata* of Madagascar, some of the males are found in a blackish plumage, though with the elongated median rectrices white, while in others white predominates over the whole body; but whether this sex is here actually dimorphic, or whether the one dress is a passing phase of the other, is at present undetermined. Some of the African species, of which many have been described, seem always to retain the rufous plumage, but the long-tail feathers serve to mark the males; and the whole group deserves far more investigation than it has ever received, as it is likely to reveal facts of the highest importance in regard to the theory of "Sexual Selection."

On the other groups of the Family there is not room to descant. A few are distinguished by the brilliant blue they exhibit, as *Myiagra azurea*, and others as *Monarcha* (or *Arses*) *chrysomela* by their golden-yellow. The Australian forms assigned to the *Muscicapidæ* are very varied, and probably require much further scrutiny. *Sisura inquieta*, for instance, has some of the habits of a Water-Wagtail (*Motacilla*), and hence has received from the colonists the name of "Dishwasher," bestowed in many parts of England on its analogue; and the many species of *Rhipidura* or Fantailed Flycatchers, which occur in various parts of the Australian Region, have manners still more singular—turning over in the air, it is said, like a Tumbler Pigeon, as they catch their prey; but concerning the mode of life of the majority of the *Muscicapidæ*, and especially of the numerous African forms, hardly anything is known. (A. N.)

FLYING AND FLYING MACHINES. See FLIGHT.

FLYING-FISH are of two different kinds. The one (*Dactylopterus*) belongs to the Gurnard family (*Triglidæ*), and is more properly called Flying Gurnard; the other (*Exocœtus*) has been called Flying Herring, though more nearly allied to the Gar-pike than to the Herring. Some other fishes with long pectoral fins (*Pterois*) have been stated to be able to fly, but this has been proved to be incorrect. The Flying Gurnards are much less numerous than the *Exocœti* with regard to individuals as well as species, there being only three or four species known of the former, whilst more than fifty have been described of the latter, which, besides, are found in numerous shoals of thousands. The *Dactylopteri* may be readily distinguished by a large bony head armed with spines, hard keeled scales, two dorsal fins, etc. The *Exocœti* have thin, deciduous scales, only one dorsal fin, and the ventrals placed far backwards, below the middle of the body; some have long barbels at the chin. In both kinds the pectoral fins are greatly prolonged and enlarged, modified into an organ of flight, and in many species of *Exocœtus* the ventral fins are similarly enlarged, and evidently assist in the aërial evolutions of these fishes. Flying fishes are found in the tropical and sub-tropical seas only, and it is a singular fact that the geographical distribution of the two kinds is nearly identical. The literature on the subject of flying fishes is very extensive, and great diversity of opinion exists among observers as regards the mode and power of their flight; but the most reliable agree that the fishes do not leave the water for the purpose of catching insects, and that they are unable to move their fins in the manner of a bat or bird, or to change voluntarily the direction of their flight, or to fly beyond a very limited distance. The most recent inquiries are those of K. Möbius (*Die Bewegungen der Fliegenden Fische durch die Luft*, Leip. 1878, 8vo), the chief results of which may be summed up thus. Flying fish are more frequently observed in rough weather and in a disturbed sea than during calms; they dart out of the water when pursued by their enemies or frightened by an approaching vessel, but frequently also without any apparent cause, as is also observed in many other fishes; and they rise without regard to the direction of the wind or waves. The fins are kept quietly distended, without any motion, except an occasional vibration caused by the air whenever the surface of the wing is parallel with the current of the wind. Their flight is rapid, but gradually decreasing in velocity, greatly exceeding that of a ship going 10 miles an hour and a distance of 500 feet. Generally it is longer when the fishes fly against, than with or at an angle to, the wind. Any vertical or horizontal deviation from a straight line is not caused at the will of the fish, but by currents of the air; thus they retain a horizontally straight course when flying with or against the wind, but are carried towards the right or left whenever the direction of the wind is at an angle with that of their flight. However, it sometimes happens that the fish during its flight immerses its caudal fin in the water, and by a stroke of its tail turns towards the right or left. In a calm the line of their flight is always also vertically straight or rather parabolic, like the course of a projectile, but it may become undulated in a rough sea, when they are flying against the course of the waves; they then frequently overtop each wave, being carried over it by the pressure of the disturbed air. Flying fish often fall on board of vessels, but this never happens during a calm or from the lee side, but

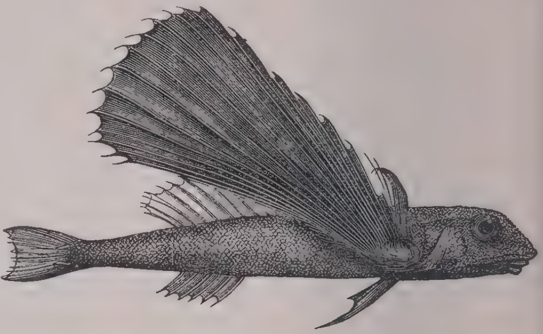

FIG. 1.—*Dactylopterus volitans.*

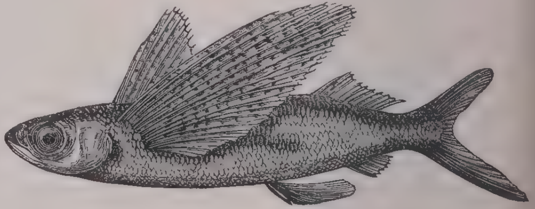

FIG. 2.—*Exocœtus callopterus.*

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[1] By some writers this section is distinguished as *Butalis* of Boie, but to do so seems contrary to rule.

during a breeze only and from the weather side. In day time they avoid a ship, flying away from it, but during the night, when they are unable to see, they frequently fly against the weather board, where they are caught by the current of the air, and carried upwards to a height of 20 feet above the surface of the water, whilst under ordinary circumstances they keep close to it. All these observations point clearly to the fact that any deflexion from a straight course is due to external circumstances, and not to voluntary action on the part of the fish.

FLYING FOX, or more correctly Fox Bat, a name applied to a family of fruit-eating bats (*Pteropidæ*), found only in the Eastern hemisphere, and there confined to the tropical regions and Australia. It comprises 9 genera and 65 species, a considerable proportion of which occur in the islands of the Malay Archipelago. They are also found throughout Africa, and extend northward and eastward to China and Japan, and southward to Tasmania. They are likewise included among the few indigenous mammals of the South Sea Islands, being found in Samoa and the Marianne Islands. The flying foxes are the largest of the bats, the kalong of Java (*Pteropus edulis*) measuring nearly a foot and a half in length, and having an expanse of wing-membrane measuring nearly five feet across. The flesh of this species is esteemed a delicacy in many parts of Malaya; but its use in this respect by no means compensates for the enormous amount of fruit which it destroys. The flying foxes are gregarious, nocturnal animals, suspending themselves during the day head downwards by thousands from the branches of trees, where, with their wings gathered about them, they bear some resemblance to huge, shrivelled-up leaves, or to clusters of some peculiar fruit. In Batchian, according to Wallace, they suspend themselves chiefly from the branches of dead trees, where they are easily caught or knocked down by sticks, the natives carrying them home in basketfuls. They are then cooked with abundance of spices, and "are really very good eating, something like hare." Towards evening these bats bestir themselves, and fly off in companies to the village plantations, where they feed on all kinds of fruit, and so numerous and voracious are they, that no garden crop has much chance of being gathered which is not specially protected from their attacks. The flying fox of India (*Pteropus medius*) is a smaller species, but is found in great numbers wherever fruit is to be had in the Indian peninsula. Of this species Mr. Francis Day, who has had special opportunities of studying it, says—"In their diet they are exclusively frugivorous, and they do very great injury to cocoa-nut plantations and mango gardens. Their habits are very intemperate, and they often pass the night drinking the toddy from the chatties in the cocoa-nut trees, which results either in their returning home in the early morning in a state of extreme and riotous intoxication, or in being found the next day at the foot of the trees sleeping off the effects of their midnight debauch." No fossil fox bats have yet been found.

FOGARAS, the capital of an Hungarian county of the same name, in Transylvania, is situated on the left bank of the river Aluta, 55 miles east of Hermannstadt, 45° 47′ N. lat., 24° 54′ E. long. Among the principal buildings are a Franciscan monastery, five churches, and a county courthouse. The population in 1870 amounted to 4714. It was near this town that Bem was defeated by the Russian generals Engelhardt and Lüders on the 12th July, 1849. The county of Fogaras lies on the Wallachian frontier, between the county of Brassó or Cronstadt on the east, and that of Nagy Szeben or Hermannstadt on the west. The climate being cold, and the surface of the country for the most part mountainous and unfavorable to agriculture, the inhabitants are chiefly employed in rearing cattle. The population of the old district in 1870 amounted to 82,852, of whom the greater number were Wallachians, the remainder being Saxons and Hungarians. The transformation of the district of Fogaras into a county took place in 1876.

FOGELBERG, Benedict Erland (1786-1854), a Swedish sculptor, was born at Gothenburg in 1786. His father, a copper-founder, encouraging an early-exhibited taste for design, sent him in 1801 to Stockholm, where he studied at the school of art. There he came much under the influence of the sculptor Sergell, who communicated to him his own enthusiasm for antique art and natural grace. Fogelberg worked hard at Stockholm for many years, although his instinct for severe beauty rebelled against the somewhat rococo quality of the art then prevalent in the city. In 1818 the grant of a Government pension enabled him to travel. He studied from one to two years in Paris, first under Pierre Guerin, and afterwards under the sculptor Bosio, for the technical practice of sculpture. In 1820 Fogelberg realized a dream of his life in visiting Rome, where the greater part of his remaining years were spent in the assiduous practice of his art and the careful study and analysis of the works of the past. Visiting his native country by royal command in 1854, he was received with great enthusiasm, but nothing could compensate him for the absence of those remains of antiquity and surroundings of free natural beauty to which he had been so long accustomed. Returning to Italy, he died suddenly of apoplexy at Trieste, December 22, 1854. The subjects of Fogelberg's earlier works are mostly taken from classic mythology. Of these, Cupid and Psyche, Venus entering the Bath, A Bather (1838), Apollo Citharede, Venus and Cupid (1839), and Psyche (1854) may be mentioned. His native Scandinavian mythology forcibly engaged the attention of Fogelberg, and in his representations of that mythology he showed, perhaps for the first time, that he had powers above those of intelligent assimilation and imitation. His Odin (1831), Thor (1842), and Balder (1842), though influenced by his study of Greek art, still display considerable power of independent, self-reliant imagination. His portraits and historical figures, as those of Gustavus Adolphus (1849), of Charles XII. (1851), of Charles XIII. (1852), and of Birger Jarl, the founder of Stockholm (1853), are faithful and dignified works. Thirty-eight copperplate engravings of Fogelberg's works, with a portrait and biographical notice, were published by M. Casimir Leconte, Paris, 1856.

FOGGIA, a city of Italy, capital of the province of Capitanata, situated near the centre of the great plain of Apulia, 122 miles by rail E.N.E. of Naples. It is well built, and the main streets are wide and clean. The principal church, originally a stately Norman edifice, was almost destroyed by an earthquake in 1731, and the upper part has been rebuilt in a different style, which greatly injures the effect. There are numerous other churches, a fortified palace, now in ruins, a large theatre, a customhouse, an orphanage, a college for daughters of the nobility, a public library, an agricultural society, an economical society, an ornithological museum, and an artesian well. The town has now become a great railway junction, just as it was formerly the meeting-place of the principal roads of the country. It is a staple market for corn and wool, and one of the largest fairs of southern Italy is held there in May. The corn magazines or *fosse* are very extensive, consisting of vaults lined with masonry under the principal streets and squares. Other articles of export are capers, wine, and oil. The flocks of sheep that descend annually in autumn from the mountains of Abruzzo into the plains of Apulia pay a toll as they pass through the city. The population in 1872 was 34,181.

Foggia was probably founded in the 9th century, and it is supposed that it occupied the site of the ancient Arpi or Argyripa, and derives its name from the *foveæ* or pits that were dug among the ruins. It was a favorite residence of Frederick II., who in 1240 held a parliament within its walls; and there he lost his third wife, Isabella, daughter of King John of England. In 1254 Manfred, the natural son of Frederick, defeated the forces of Pope Innocent IV. outside the city, which was not long afterwards laid in ruins by Charles of Anjou. Ferdinand I. summoned his barons and prelates to Foggia to prepare a crusade against the Turks.

FOIL, thin silvered sheet-copper, highly polished, and coated with mixtures of isinglass and transparent colors, is employed by jewellers to place at the back of paste and inferior stones to improve their tints and lustre. Copper foil, known also as Nuremberg or German foil, is made from thin hammered copper plates by heating between sheets of iron, boiling in solution of tartar and salt, drying, hammering, and lastly polishing with whiting on a convex smooth surface of copper.

FOIX (Lat. *Fuxum*), a town of France, capital of an arrondissement, and also of the department of Ariége, is situated on the left bank of the Ariége, in the gorge of a narrow valley at the foot of the Pyrenees, 44 miles south of Toulouse. It is badly built, and its streets are uneven and irregular. In the middle of the town rises the old castle of the counts of Foix, situated on a rock 50 feet high, and possessing three fine towers, all anterior to the 15th century. The principal industries of the town are connected with the manufacture of iron, but there are also breweries, tanneries, and dye works. Foix is the seat of a tribunal of justice of the first instance, and possesses a communal college, a teachers' seminary, a library connected with the prefecture, a prison, and a correction house. The population in 1876 was 5127.

FOIX, Counts of, an ancient French family which flourished from the 11th to the 16th century. The title was first assumed by Roger, nephew of Peter Roger count of Carcassonne, on his inheriting the town of Foix with the adjoining lands from his uncle. He died in 1064, and was succeeded by his brother Peter, who died in 1070 and was succeeded by his eldest son Roger II. This count was excommunicated by Pope Pascal II. for taking possession of ecclesiastical property, but in 1095 he took part in the crusade, and afterwards by rich donations made his peace with the church. He died in 1125, and was succeeded by Roger III., who on his death in 1141 was succeeded by his eldest son Roger Bernard I. Roger Bernard was succeeded in 1188 by his only son Raymond Roger, who in 1190 accompanied Philip Augustus to the Holy Land, and distinguished himself at the capture of Acre. He was afterwards engaged in the wars of the Albigenses, and on his being accused of heresy, Simon de Montfort was put in possession of his estates. He, however, made his peace with the church some time before his death, which took place in 1223 from exposure and fatigue at the siege of Mirepoix. This count was a patron of the Provençal poets, and reckoned himself one of their number. He was succeeded by his son Roger Bernard II., surnamed the Great, who distinguished himself in the wars against the Albigenses, joined in an alliance against Louis VIII. of France, lost his lands but succeeded in regaining them, was twice excommunicated but obtained absolution, and died in 1241 in the abbey of Bolbone, where he was for a short time a monk. Roger IV., his son and successor, did homage for his lands to the king of France and the count of Carcassonne. He died in 1265. His son and successor, Roger Bernard III., was more famous as a poet than a warrior. He was taken prisoner by Philip the Bold and again by Peter III. of Aragon; and before his death in 1302 began the quarrel of the house of Foix with that of Armagnac. His son and successor, Gaston I., continued the war, was excommunicated in 1308 by Clement V. and imprisoned in the Châtelet, Paris, but, regaining his freedom shortly afterwards, joined Louis X. in 1315 in the expedition against Holland, and died on the way home. To him succeeded his eldest son Gaston II., who became reconciled with the house of Armagnac, joined the Navarrese in their wars against the Castilians, over whom he won a great victory at Tudela in 1335, took part in the war of the French against the English in 1337, and in 1343 assisted Alphonso XI. of Castile against the Moors. He died at Seville in September of the same year. His son Gaston III. (1331–1391), surnamed on account of his beauty Phœbus, was the most famous of the old Foix family. He took part in the wars against the English in 1345, and was on that account appointed by the king of France governor of Languedoc and Gascony. In 1346 he married Agnes of Navarre, but on account of a dispute with her brother Charles the Bad, he divorced her in 1373. On suspicion of being concerned in a conspiracy in conjunction with his brother-in-law he in 1356 suffered a short imprisonment in the Châtelet. After obtaining his release he took part in the wars against the heretics of Prussia, and on his return in 1358 he assisted in releasing the royal princesses from the hands of the Jacquerie at Meaux. In the same year he recommenced the quarrels with the house of Armagnac, and took the count of Armagnac prisoner at the battle of Launac in 1372. In 1380 he was again appointed governor of Languedoc by Charles V., but that king dying the same year the regency replaced the count of Foix by the duke of Berry. Gaston defeated and slew the duke, but was afterwards induced to resign his claims. In 1390 Gaston entertained Charles VI. in his castle of Mazères, and agreed for a sum of money to make him heir of his dominions. He died suddenly of apoplexy the same year when returning from the chase. Shortly after his death Charles VI. ceded the estate of Foix to Matthew, great-great-grandson of Roger I., who died without issue in 1398. On his death his sister's husband Archambault de Grailly took possession of the estates, and in 1401 assumed the title. Dying in 1412 he was succeeded by his son Jean de Grailly, who became governor-general of Languedoc, Auvergne, and Guienne, and, dying in 1436, was succeeded by his son Gaston IV., who took part in the wars of Charles VII. against the English, and was raised to the peerage of France. Gaston's father-in-law, Jean II. of Navarre, declared him in 1455 his successor; and Louis XI. conferred on him the seignory of Carcassonne and the countships of Roussillon and Cerdagne. In 1471 he joined in a league against Louis, which, however, was rendered abortive by the death of the king's brother. On the death of Gaston in 1472, the house of Foix became merged in that of Navarre.

FOIX, Gaston de. See Nemours.

FOIX, Paul de (1528–1584), a French prelate and diplomatist, was born in 1528. He studied Greek and Roman literature at Paris, and jurisprudence at Toulouse, where, shortly after finishing his curriculum, he delivered a course of lectures on civil law, which gained him great reputation. At the age of nineteen he was named councillor of the *parlement* of Paris. Having in this capacity expressed himself favorable to the adoption of mild measures in regard to certain persons accused of Lutheranism, he was arrested, but escaped punishment, and subsequently regained the favor of the French court. At the end of 1561 he was sent ambassador to England, where he remained four years, and in 1565 endeavored in vain to persuade Elizabeth to consent to the surrender of Havre to the French. He was afterwards sent to negotiate a marriage between Elizabeth and the duke of Anjou. On account of his former toleration of the Lutherans, Foix only with difficulty escaped perishing in the Massacre of St. Bartholomew in 1572; but having been sent in 1573 on an embassy to Italy, he was admitted to an audience of the pope, and succeeded in thoroughly establishing his reputation for orthodoxy. In 1576 he was made archbishop of Toulouse. He was afterwards employed by the king of France on various important missions, and in 1579 was appointed ambassador to Rome, where he remained till his death in 1584.

Les Lettres de Messire de Paul de Foix, archevesque de Toloze et ambassadeur pour le roy auprès du pape Grégoire XIII., au roi Henry III., were published in 1628, but there are some doubts as to their authenticity.

FOKSHAN, or Fokshani, a town of Roumania, is situated 104 miles N.E. of Bucharest on the river Milkov, which forms the boundary line between Wallachia and Moldavia—the larger portion of the town being in Wallachia. It possesses a normal school, and is the seat of a prefecture and of a criminal and district court of justice. It has a considerable trade in corn with Galatz, and is in the vicinity of the district which produces the best Moldavian wine. A congress between Russian and Turkish diplomatists was held near the town in 1772. In the neighborhood the Turks suffered a severe defeat from the Austrians and Russians in 1789. The population in 1873 was 20,323.

FOLARD, Jean Charles de (1669–1752), a French writer on military tactics, was born at Avignon, 13th February, 1669. His military ardor was first awakened by reading Cæsar's *Commentaries*, and became so strong that he twice made his escape from parental control, the second time being successful in obtaining the fulfilment of his wishes. When he joined the army he was only sixteen years of age, but the zeal with which he studied the scientific department of his profession soon brought him into notice, and in 1702 he became aide-de-camp to the duke of Vendôme, who was then in command of the French forces in Italy. For his services with the duke's brother in Lombardy in 1705 Folard received the cross of St. Louis, and in the same year he distinguished himself at the battle of Cassano, where he was severely wounded. In 1706 he defended Modena against Prince Eugene. He was dangerously wounded at the battle of Malplaquet, and a few months afterwards was taken prisoner by the Austrians. In 1711 he was appointed governor of Bourbourg, and he afterwards entered the service of Charles XII. of Sweden, and accompanied him in the invasion of Norway; but after the death of Charles he returned to France, and served as colonel in the Spanish campaign of the duke of Berwick. On the conclusion of peace he applied himself with renewed diligence to the study of military tactics, and expounded his views in the following works:—*Nouvelles Découvertes* *sur la Guerre*, 1724; *Commentaires sur Polybe*, 1727; and *Fonctions et Devoirs d'un Officier de Cavalrie*, 1733. The system of column formation advocated by Folard, and many of his other opinions, have met with nothing but ridicule from tacticians; but Frederick the Great, while condemning his general system of tactics, nevertheless published an abridgment of his works, under the title of *Esprit du Chevalier Folard*, 1761, in the preface to which he expressed a high opinion of the sagacity of Folard's criticism of certain French generals, strongly recommended many of his tactical rules and methods of defence, and admitted that even in his most visionary plans hints were to be found very valuable and suggestive. Folard died at Avignon in 1752.

See *Mémoires pour servir à l'histoire de la vie du Chevalier Folard*, 1753.

FOLDVÁR, or **DUNA FÖLDVÁR** (Danube Földvár), a town of Hungary in the county of Tolna, on the right bank of the Danube, 48 miles south of Buda, 46° 48′ N. lat., 18° 45′ E. long., is situated partly on the crest and partly on the side of a hill. Among the principal buildings are a circuit judge's court, customs office, barracks, four churches, a Franciscan monastery, and a high school. Földvár, on account of its position, is an important steampacket station, and carries on a considerable trade in wood for building purposes by means of the Danube; it is moreover a dépôt for salt, and has an extensive sturgeon fishery. The surrounding country is fertile both in corn and wine, and the inhabitants are much engaged in agricultural and commercial pursuits, fruit-growing, the manufacture of pottery, and fishing. The town, which is a domain of the university of Pesth, had formerly strong fortifications, of which some remains still exist. In the revolution of 1848–49 Földvár was considered an important strategical position, on account of its commanding the communications between the upper and lower Danube. In 1869 the population was 12,382.

FOLENGO, TEOFILO (1491–1544), otherwise known as Merlino Coccajo or Cocajo, one of the principal macaronic poets of the 16th century, was born of noble parentage at Cipada near Mantua, November 8, 1491. From his infancy he showed great vivacity of mind, and a remarkable cleverness in making verses. At the age of sixteen he entered the monastery of Monte Casino near Brescia, and eighteen months afterwards he became a professed member of the Benedictine order. For a few years his life as a monk seems to have been tolerably regular, and he is said to have produced a considerable quantity of Latin verse, written, not unsuccessfully, in the Virgilian style. About the year 1516 he forsook the monastic life for the society of a wellborn young woman named Girolama Dieda, with whom he wandered about the country for several years, often suffering great poverty, having no other means of support than his talent for versification. His first publication was the *Merlini Cocaii Macaronicon*, which relates the adventures of a fictitious hero named Baldus. The coarse buffoonery of this work is often relieved by touches of genuine poetry, as well as by graphic descriptions and acute criticisms of men and manners. Its macaronic style is rendered peculiarly perplexing to the foreigner by the frequent introduction of words and phrases from the Mantuan patois. Though frequently censured for its occasional grossness of idea and expression, it soon attained a wide popularity, and within a very few years passed through several editions. Folengo's next production was the *Orlandino*, an Italian poem of eight cantos, written in rhymed octaves. It appeared in 1526, and bore on the title-page the new pseudonym of Limerno Pitocco (Merlin the Beggar) da Mantova. In the same year, wearied with a life of dissipation, Folengo returned to his ecclesiastical obedience; and shortly afterwards wrote his *Chaos del tri per uno*, in which, partly in prose, partly in verse, sometimes in Latin, sometimes in Italian, and sometimes in macaronic, he gives a veiled account of the vicissitudes of the life he had lived under his various names. We next find him about the year 1533 writing in rhymed octaves a life of Christ entitled *L'Umanità del Figliuolo di Dio*; and he is known to have composed, still later, another religious poem upon the creation, fall, and restoration of man, besides a few tragedies. These, however, have never been published. Some of his later years were spent in Sicily under the patronage of Don Fernando de Gonzaga, the viceroy; he even appears for a short time to have had charge of a monastery there. In 1543 he retired to Santa Croce de Campesio, near Bassano; and there he died on the 9th of December in the following year. Among writers of macaronics Folengo undoubtedly holds a very high place; nor has his title to the name of poet been disputed even by his most hostile critics. He is frequently quoted and still more frequently copied by that other Benedictine, his great French contemporary, Rabelais. The earlier editions of his *Opus Macaronicum* are now extremely rare. The often reprinted edition of 1530 exhibits the text as revised by the author after he had begun to amend his life.

FOLEY, JOHN HENRY (1818–1874), sculptor, R. A., was born at Dublin, May 24, 1818. Through a distant relative, a sculptor in the city, his attention was early directed to the profession which was to occupy his life, and at thirteen he began to study drawing and modelling at the schools of the Royal Dublin Society, where he took several first-class prizes. In 1834 he proceeded to London, and in 1835 was admitted a student in the schools of the Royal Academy. He first appeared as an exhibitor in 1839 with his Death of Abel and Innocence. Ino and Bacchus, exhibited in 1840, gave him immediate reputation, and the work itself was afterwards commissioned to be done in marble for the earl of Ellesmere. Conceived entirely without classical or other affectation, this work has the charm of rare simplicity and grace. Lear and Cordelia and Death of Lear were exhibited in 1841, Venus rescuing Æneas and The Houseless Wanderer in 1842, Prospero and Miranda in 1843. In 1844 Foley sent to the exhibition at Westminster Hall his Youth at a Stream, and was, with Calder Marshall and John Bell, chosen by the commissioners to do work in sculpture for the decoration of the Houses of Parliament. Statues of John Hampden and Selden were executed for this purpose, and received liberal praise for the propriety, dignity, and proportion of their treatment. Commissions of all kinds now began to come rapidly, and without going out of his way to seek it, Foley had from this time until his death work sufficient to occupy not only the whole of his own time, but also that of the numerous assistants and pupils whom he trained. Fanciful works, busts, bas-reliefs, tablets, and monumental statues were in great numbers undertaken and executed by him with that steady equality of worthy treatment which is perhaps the next best thing to the inspiration of great genius. In 1849 he was made an associate and 1858 a member of the Royal Academy; but although until his death his name remained on the list of Royal Academicians, he, after 1861, owing, it is said, to some misunderstanding with the hanging committee of that year, ceased not only to exhibit but also to hold any communication with the body of which he was a member. Among his numerous works the following may be noticed, besides those mentioned above:—The Mother; Egeria, for the Mansion House; The Elder Brother in Comus, his diploma work; The Muse of Painting, the monument of James Ward, R. A.; Caractacus, for the Mansion House; Helen Faucit (Mrs. Theodore Martin); Goldsmith and Burke, for Trinity College, Dublin; Faraday; Reynolds; Barry, for Westminster Palace Yard; John Stuart Mill, for the Thames embankment; O'Connell and Gough, for Dublin; Clyde, for Glasgow; Clive, for Shrewsbury; Hardinge, Canning, and Outram, for Calcutta; Hon. James Stewart, for Ceylon; the symbolical group Asia, as well as the statue of the prince himself, for the Albert Memorial in Hyde Park; and Stonewall Jackson, for South Carolina. The statue of Outram is probably his masterpiece, and certainly displays more imaginative fire than any other of his works, while well exhibiting that perfect sanity of conception as well as that full mastery of the means of his art by which all his works are characterized. Foley's early fanciful works have some charming qualities; but he will probably be always best remembered for the workmanlike and manly style of his monumental portraits. His life was entirely devoted to his art, and he seems to have addressed himself to it with all the workday docility of a craftsman, and at the same time with strong feelings of duty and responsibility. Of great modesty, and rather reserved in manner, he was open to all that influences a refined nature; in poetry and music he was not only a student and admirer, but a composer and performer. He died at Hampstead of a pleuritic effusion after a short illness, preceded by a long indisposition, August 27, 1874, and was on the 4th of September buried in St. Paul's Cathedral. He left his models to the Royal Dublin Society, his early school, while a great part of his property goes eventually to the Artists' Benevolent Fund.

FOLIGNO, or Fuligno (ancient *Fulginium*), a town in the Italian province of Perugia, is situated in a beautiful and fertile valley on the Topino, 20 miles S.E. of Perugia by railway. It is an active and industrious town, its manufactures being chiefly woollen fabrics, silk, paper, wax-candles, and soap. Its principal buildings are the cathedral, the Palazzo del Governo, the Palazzo Comunale, the theatre, and the churches of S. Anna and S. Niccolò, both of which contain some fine paintings. Foligno was the seat of a school of painting, the most distinguished master of which is Niccolò Alunno, to whom a monument was erected there in 1872. Foligno is the Umbrian Fulginium, and afterwards became a Roman municipality. In the Middle Ages it was known as Fulignum, and for a long time retained its independence, but in 1281 it was destroyed by the Perugians. After it was rebuilt it was ruled by the Trinci family until 1439, when it was united to the States of the Church. In 1832, it was much damaged by an earthquake, and it suffered from the same cause, but less severely, in 1839, 1853, and 1854. The population in 1871 was 8471.

FOLKES, Martin (1690–1754), an eminent English antiquary, was born at London, October 29, 1690. At the age of seventeen he entered at Clare College, Cambridge; where he distinguished himself so much in mathematics that when only twenty-three years of age he was chosen a fellow of the Royal Society. He was elected one of the council in 1716, and in 1723 Sir Isaac Newton, president of the society, appointed him one of the vice-presidents. On the death of Newton he became a candidate for the presidency, but the higher standing and superior influence of the other candidate, Sir Hans Sloane, carried the election against him. In 1733 he set out on a tour through Italy, in the course of which he found opportunity of consulting the best furnished cabinets of that country, and composed his admirable "Dissertations on the Weights and Values of Ancient Coins," which he read before the Society of Antiquaries. Before the same society he read in 1736 his "Observations on the Trajan and Antonine Pillars at Rome," and also communicated his "Table of English Gold Coins from the 18th year of King Edward III., when gold was first coined in England, to the present time, with their Weights and Intrinsic Values." In 1745 he printed this work along with another on the history of silver coinage. He also contributed both to the Society of Antiquaries and to the Royal Society various other papers, chiefly on Roman antiquities, which were published in their transactions. In 1741 he succeeded Sir Hans Sloane as president of the Royal Society; in the following year he was made a member of the French Academy; and in 1746 was honored with the degree of LL.D. from Cambridge and Oxford. He died in 1754.

FOLKESTONE, or Folkstone, a municipal borough, seaport, and market-town of England, county of Kent, is situated on the London and South-Eastern Railway, 7 miles W.S.W. of Dover. It is very irregularly built, part of it lying in a hollow between the chalk and greensand hills, and other portions on the hills. Folkestone is much frequented in summer for sea-bathing, and steam packets ply daily between the town and Boulogne. Many of the inhabitants are engaged in the fisheries, and there is also a considerable shipping trade. The pier-harbor is 19 acres in extent, and admits vessels of 150 tons burden. In 1861 a low-water landing pier was erected, which enables passengers to land from the steamers at all states of the tide. The coast is defended by three martello towers, and a battery situated on the heights protects the town. During 1877 the number of vessels that entered the port was 885, with a tonnage of 154,897, and 854 cleared, with a tonnage of 153,208. Of these the number engaged in trade with foreign countries was—entered 46, with a tonnage of 9333; cleared 148, with a tonnage of 22,452. Among the public buildings may be mentioned the free grammar-school, the harbor-house, the town-hall and market-house, and the parish church a cruciform structure in the early Gothic style, with a tower rising from the intersection. It has recently been enlarged and restored. The original church of St. Eanswitha was built in 1095, and attached to it was a monastery for Benedictine monks, but the devastations of the sea compelled the removal of both to the cliff on which the church now stands. The monastery was destroyed at the dissolution of religious houses in 1535. At a very early period Folkestone was a place of some importance, and Roman remains have been found near it. It was one of the manors attached to the Saxon crown, and it was granted by William the Conqueror to his knight William d'Avranches, who built a Norman stronghold near the site of the old castle founded by Eadbald, king of Kent, about 630. The cliff on which these stood has been almost wholly swept away by the encroachments of the sea. In the time of Queen Elizabeth Folkestone contained only 120 houses, and it was a mere fishing village until the formation of a harbor in 1809. The opening of the railway in 1844, and the establishment of the steam packet service with Boulogne lent additional impulse to the town, and for some years it has been rapidly increasing. Harvey, the discoverer of the circulation of the blood, was born there in 1578. Folkestone unites with Hythe in returning a member to parliament. The population in 1871 was 12,694.

FOLK-LAND, or Folc-land, in early English law was the land belonging to the community at large—the *ager publicus*—as distinguished from *boc-land*, or land granted to individuals in private ownership. The conception of the land as primarily belonging to the nation or tribe appears to be universal in early civilization. As civilization advances the rights of individuals emerge and increase in importance until, as in England at the present day, the original conception has entirely disappeared. The process by which it was lost may be shortly stated as follows. (1) Grants of land were made to individuals and to religious corporations (boc-land), subject only to the *trinoda necessitas* (military service, and building bridges and fortresses). The king might hold land so granted. (2) Temporary rights over the folk-land were also granted to individuals, subject to various rent services or money payments. (3) The remaining portion of the folk-land not disposed of in this way came to be regarded as belonging to the king. Ultimately all land was said to be held of the king. Even where traces of the original conception remained in the rights of commoners the natural order was reversed, and they were regarded as deriving their right from the grant of some individual lord. While the folk-land became the *terra regis*, the private property of the king in land merged in the folk-land, and the king of England for many centuries occupied the anomalous position of being ultimate owner of all the land, and sole owner of the old folk-land, and yet, at the same time, incapable of holding land in private ownership. If a king purchased land with any private moneys of his own, it devolved upon his successor in office like the rest of the crown lands. All this, however, has now been changed. The crown lands have become public lands again, and the management of these is vested in the Commissioners of Woods, Forests, and Land Revenues; and the private estates of the sovereign are now held on the same conditions as those of ordinary persons.

FOLK-LORE. This word, formed in imitation of such German compounds as "Volksepos," "Volksfest," "Volkslied," has recently become current in the English language[1] as a convenient though somewhat vague general heading under which to arrange all that has been observed or recorded of the traditions current among the "common people" of different countries, civilized or uncivilized, whether in ancient, mediæval, or modern times. Each nation and each locality has, of course, a "folk-lore" as it has a language; and it is obvious that to set forth any given folk-lore, with all its stratifications, in a comprehensive and orderly way, would virtually be equivalent to exhibiting fully the past and present intellectual, moral, religious, and social condition of the people to whom it belonged. An exhaustive account of the folk-lores of the world would be equivalent to a complete history of the thoughts of mankind.

The eccentricities of traditionary story and traditionary practice have always been found a more or less interesting and amusing study by the contemplative observer of human nature; and almost all travellers and historians, from Herodotus downwards, have occasionally condescended to add something to the general collection of curiosities in that department. But to make a thorough investigation of the "vulgar antiquities" of any country, and especially of one's own, was, until very recently, regarded as childish and useless. An exception, indeed, was made in favor of the folk-lores of ancient Greece and Rome, as being intrinsically beautiful and exceptionally instructive. But the very fact that these had been beautified by artistic treatment impaired their usefulness from the purely antiquarian point of view; and in any case the floating traditions of Attica and Latium were too few, too fragmentary, and gathered from too narrow an area to furnish adequate data for the anthropologist and the sociologist. Here, as in so many other instances, it was necessary that men should greatly extend the area of their investigations before they could rightly understand that which alone they were curious to know.

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[1] It was first suggested by Mr. Thoms in the *Athenæum* of 1846 (p. 862). Its equivalent does not actually occur in German.

It was in Germany that the study of folk-lore first entered upon its scientific stage. One of the earliest symptoms of the awakening of a wider and more sympathetic interest in the various products of a nation's mind, its legends and its tales, its manners and its customs, its laws, government, religion, and daily life, was the appearance in 1778–79 of Herder's celebrated collection of popular songs. But the new day was fairly ushered in by the successive publications of the brothers Grimm, more particularly of the *Kinder- und Haus-Mährchen* in 1812, and of the *Deutsche Mythologie* in 1835. The latter work, which was closely dependent on the former, showed for the first time what results may be hoped for by an intelligent investigator, if only, laying aside all prejudice, he will put himself to the trouble of collecting largely and widely, and of interpreting faithfully and rationally, a nation's oral traditions and unwritten customs. It was seen that, although many relics of the past had been irrecoverably lost, enough had been preserved to furnish conclusive proof of the oneness in faith as well as in speech of the Teutonic race, and also to give indications, in many instances, of the precise points at which the divergences had occurred. This new knowledge, derived to a large extent from the skilful use of folk-lore "collected from the mouths of old women in the spinning-rooms of German villages," acquired an altogether peculiar interest and importance from the other discovery by which the philological labors of Bopp and others had been crowned,—the discovery, namely, of the original unity of all the Aryan races, and the demonstration of the fact that the Teutons themselves were but one branch of a greater family, including Hindus and Celts, which had at one time inhabited the central plain of Asia, and before dispersing eastward and westward, had developed an ineffaceably characteristic speech, civilization, and religion. The identification verbally of Dyaus, Zeus, Jo(vi)s, Tiw, Zio, and Tyr was followed, as investigation proceeded, by the identification really of many of the strange forms in which religious sentiment had found expression; and comparative mythology became an inseparable companion of comparative philology. (See MYTHOLOGY and PHILOLOGY.) It was thenceforward obvious that every mythology, in the Aryan family at least, however puerile or absurd it might at first sight appear, was a fit subject for scientific investigation, and capable of yielding scientific results. The problem in each case was to trace the nursery tale to the legend, and the legend to the myth, and the myth to its earliest germ, and as far as possible to indicate the foreign interpolations when they occurred, and account for the local accretions. In this way the history of a story, like the history of a word, was frequently found to be more interesting and more instructive than the history of a campaign. Once this had been realized, the new field of folk-lore found many skilled laborers; and the quantity of material available for examination and classification rapidly increased. Each fresh comparison made it increasingly plain that in groundwork and plot the stories current among the Indo-European peoples were substantially identical. The reader of the fables of La Fontaine found nothing essentially and absolutely strange in the Pankatantra or Hitopadesa; the Indian ayah was discovered to have unmistakably the same stock of stories as the German, Norwegian, or Celtic nurse. In a few cases, indeed, it could be shown that the wide diffusion of some particular fable was attributable to migrations which had taken place within the historic period;[1] and in other cases it could hardly be doubted that certain very remarkable coincidences were still mere coincidences and nothing more;[2] but in a great majority of instances, it was plain that the notion of borrowing or copying having occurred was inadmissible, and that nothing could account for their constant similarity except the theory of a common origin. They were "primitive or organic legends, representing one common ancient stratum of language and thought reaching from India to Europe;" the others were secondary or inorganic, consisting of "boulders of various strata carried along by natural and artificial means from one country to another."[3]

The aboriginal Aryan legends may be arranged under one or other of two categories, the myth or the fable. That primitive fables actually exist, stories expressly invented for a moral or didactic purpose, seems a well-established fact. The fable of the King and the Bee, for example, crops up alike in India, in Greece, and in Norway, in forms that cannot be accounted for by direct oral or literary transmission;[4] and it would seem that the story of the Master-Thief (ἀρχὸς φηλητέων) which is to be met with in the Hitopadesa, in Herodotus, in the *Tales of the Alhambra*, and which is current in Norway and also in the Western Highlands of Scotland, must probably also be regarded as embodying at least a fable-germ.[5] The organic fables, however, are not so numerous as the organic myths,—those stories, that is to say, which, whether based on mistaken metaphor or distorted history, are at least the product of the unconscious play of fancy. The same characters and the same incidents constantly recur under innumerable names and shapes. "The story of the heroes of Teutonic and Hindu folk-lore, the stories of Boots and Cinderella, of Logedas Rajah and Surya Bai, are the story also of Achilleus and Oidipous, of Perseus and Theseus, of Helen and Odysseus, of Baldur, and Rustem, and Sigurd. Everywhere there is the search for the bright maiden who has been stolen away, everywhere the long struggle to recover her. The war of Ilion has been fought out in every Aryan land" (Cox). What we are accustomed to associate with the name of William Tell is told of many archers under other names, in England (William of Cloudsle), Germany, Denmark, Norway, Iceland, and Lapland;[6] the same story of the young hero dying in the fulness of youth is told of Baldur and Isfendiyar, Sifrit, and Achilles. The stories vary widely under the influence of climate, religion, and civilization, and yet remain substantially the same. The sun-myth, when transferred from southern to northern latitudes, cannot but undergo some change of shape; the *dramatis personæ* are as various in each fable as the fauna and flora of the regions in which it is told. Odin, when no longer recognized as a deity, becomes simply the wild huntsman or Hellequin; when civilization makes even such a being no longer credible, he still survives possibly as Harlequin or Robin Hood.

Hitherto the systematic study of comparative folk-lore has been almost exclusively confined within Aryan limits. But the successful application of scientific method in that field has encouraged many laborers in other regions, and an amount of material is being accumulated which may be expected ultimately to yield very important results in ethnology and anthropology. So far as the savage tribes of the world are concerned, it would seem that the greater proportion of trustworthy data is to be derived from that department of their "folk-lore" which manifests itself in traditionary practices; but in no case, indeed, can the comparative mythologist afford to overlook the qualifying or corroborative evidence supplied by what may be called comparative "ethology." Every custom has an instructive history if we can but succeed in interpreting its lore. In ascertaining when, where, and how any given tribe came first to worship plants, or animals, or ghosts, we get definitely nearer the solution of the fundamental problem of anthropology. Even the modern usages of social and domestic life, the observances that accompany such incidents as marriage, birth, and death, when skilfully read, are capable of telling us something at least of the condition of primitive man. See ANTHROPOLOGY, ANIMISM, DEMONOLOGY, FIRE, FUNERAL RITES, MARRIAGE, etc.

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[1] See Max Müller's paper "On the Migration of Fables," in the *Contemporary Review* for 1870, republished, with additions, in *Chips from a German Workshop*, vol. iv.

[2] The Hottentots, for example, have a version of the "vestigia nulla retrorsum" fable, and a number of traces of the stories of Renard the Fox. The Zulus also have tales resembling that of Jack the Giant-Killer. See Max Müller, *Chips*, ii. 212; iv. 156. So with the large family of stories which turn on the idea of gods wandering on earth in the likeness of men.

[3] Max Müller, *Chips*, ii. 245.

[4] Max Müller, *Chips*, ii. 232; iv. 153. Sir George W. Cox also finds that the legend of "The Carter, the Dog, and the Sparrow" would never have found its way into the nurseries of German peasants if written by Grimm himself in imitation of some other Aryan tale (*Mythology of the Aryan Races*, i. 124–129, 167).

[5] Cox, *Mythology of the Aryan Races*, i. 124 *seq.*

[6] But also, it ought to be added, among Turks, Mongolians, and Samoyedes,—in other words, beyond the Aryan territory.

Literature.—The oldest professed collections of English folklore are those of Aubrey (*Miscellanies*, 1686, and frequently reprinted), and Bourne (*Antiquitates Vulgares*, 1725). The latter was incorporated by Brand in his *Observations on Popular Antiquities*, 1777, republished by Sir Henry Ellis in 1813, and again in 1841. *The Every-Day Book* of Hone appeared in 1826, and *The Year Book* in 1829. Among the more recent publications of a similar class may be mentioned the *Book of Days*, and *Popular Rhymes of Scotland*, by Chambers. Max Müller's *Essay on Comparative Mythology* was first published in 1856; Dasent's *Tales from the Norse*, with an introduction, in 1859; Campbell's *Popular Tales of the West Highlands* in 1861; Kelly's *Curiosities of Indo-European Tradition and Folk-Lore* in 1863; see also Hardwick's *Traditions, Superstitions, and Folk-Lore* (1872); and *Folk-Lore of the Northern Counties of England and the Borders*, by W. Henderson, with an appendix on Household Stories, by S. Baring-Gould (1876). As for Germany, since the publication of the *Kinder- u. Hausmährchen* (1812), and of the *Deutsche Mythologie* (1835), "the myths, the legends, the nursery-tales, the songs, proverbs, and popular customs of the Scandinavo-Germanic race have had a whole host of faithful expounders and affectionate illustrators, who have scarcely left a single foot unexplored of that vast and interesting field of tradition" (De Gubernatis). Special reference may be made to the *Deutsche Mythologie*, by Mannhardt, and to the *Zeitschrift für Deutsche Mythologie und Sittenkunde*, edited by Mannhardt and Wolf (1853–59). The collection of Norse popular tales by Asbjörnsen and Moe (1842–43) has for the most part been translated by Dr. Dasent (as above). Castrén has given an account of the mythology of Finland (*Finnische Mythologie*, edited by Schiefner); Kreuzwald of the popular tales of Esthonia (*Ehstnische Mährchen*, 1869); and Afanassieff of the folk-lore of Russia. The Slavonic mythology has been specially treated by Popoff, Kaisaroff, and Hanusch; while Osinski and Grohmann have dealt respectively with the folk literatures of Poland and Bohemia. Hahn has published a collection of *Griechische u. Albanesische Mährchen* (1864), in the introduction to which he gives forty "story-roots" (Märchen- und Sagformeln); and something has been done for the folk-lore of Rome by R. H. Busk (1874). For Spain reference may be made to Fernan Caballero; for Brittany to Villemarqué; for Iceland to Powell and Magnusson among others; for Eskimo tales to Rink. Radloff has dealt with the folk literature of the Turkish races of south Siberia; and a volume of *Kalmuck and Mongolian Traditionary Tales* was published in 1873. For Corea, see Dallet (*Église de la Corée*, 1874); for China, the works of Doolittle and Dennys; for Dardistan, Leitner; and for Southern Africa, the *Zulu Nursery Tales*, by Rev. Henry Callaway, M. D. (1866), and the *Hottentot Fables and Tales* of Dr. Bleek (1864). For American folk-lore, see Brinton's *Myths of the New World*, and Bancroft's *Races of the Pacific*. The works of Sir John Lubbock, and Messrs. Herbert Spencer, Tylor, M'Lennan, and Morgan deal largely with the folk-lore of various savage tribes. As bearing upon the general subject of comparative mythology, see the works of Kuhn, especially his *Herabkunft des Feuers und des Göttertranks* (1859); Bastian (*Der Mensch in der Geschichte*); Roth (*Ueber den Mythus von den fünf Menschen-geschlechtern*); Max Müller (*Lectures on Science of Language*, 2d series. and *Chips from a German Workshop*, vol. ii.); M. Michel Bréal (*Hercule et Cacus, Étude de mythologie comparée*, and *Le Mythe d'Œdipe*); Husson (*La Chaine Traditionelle, Contes et Légendes au point de vue Mythique*, 1874); Fiske (*Myths and Myth-makers*, 1873); and Gubernatis (*Zoological Mythology*, 1872). (J. S. BL.)

FOLLEN, AUGUST (or, as he afterwards called himself, **ADOLF**) **LUDWIG** (1794–1855), a German poet, was born at Giessen in Hesse-Cassel, January 21, 1794. He studied theology at Giessen and law at Heidelberg, and after leaving college edited the *Elberfeld Allgemeine Zeitung*. For connection, real or supposed, with some radical plots, he was imprisoned for two years at Berlin. When released in 1821 he went to Switzerland, where he taught in the canton school at Aarau, farmed from 1847 to 1854 the estate of Liebenfels in Thurgau, and then retired to Bern, where he lived till his death (26th December, 1855). Besides a number of minor poems he wrote *Harfengrüsse aus Deutschland und der Schweiz* (1823), and *Malegys und Vivian* (1829), a knightly romance after the fashion of the romantic school, edited parts of *Tristan und Isolde* and the *Niebelungenlied*, translated the Homeric Hymns in company with R. Schwenck (Giessen, 1814), *Tasso's Jerusalem Delivered* (1818), and a collection of Latin hymns and sacred poetry (Elberfeld, 1819). In 1846 he published a brief collection of sonnets entitled *An die Gottlosen Nichts-Wüthериche*. This was aimed at Ruge, and was the occasion of a literary duel between the two authors. Follen's posthumous poem *Tristan's Aeltern* (Giessen, 1857) may also be mentioned, but his best-known work is a well-executed collection of German poetry entitled *Bildersaal Deutscher Dichtung* (2 vols., 1827).

FOLLEN, CHARLES (1796–1840), brother of the preceding, was born at Romrod, in Hesse-Darmstadt, September 4, 1796. He studied theology and law at Giessen, where he acted for some time as privatdocent. His liberal sentiments and writings, and the part he took in the defence of popular rights, made him obnoxious to the Government of his own province. He accordingly went to Jena to lecture there, but the assassination of Kotzebue by Sand happened almost immediately after his arrival, and the Government believed or affected to believe that Follen was an accomplice. The inquiries that were made conclusively proved his innocence, but notwithstanding this he found it necessary to remove to Switzerland, where he taught in the cantonal school of the Grisons at Chur, and at the University of Basel. Whilst thus engaged the Prussian Government demanded his surrender as a political prisoner. Twice the Government of Basel refused, but the third request was so peremptory that they were unwillingly preparing to comply, when Follen saved himself by a hurried flight. In the beginning of 1825 he arrived in the United States, and was employed for the next ten years in teaching ecclesiastical history, ethics, and the German language and literature at Harvard College. He then acted as Unitarian clergyman at New York and East Lexington. He perished, along with 175 fellow-travellers, at the burning of the steamship "Lexington," in Long Island Sound, January 13, 1840. Follen was the author of several very celebrated and popular songs written in the interests of liberty. The best is perhaps the *Bundeslied*, beginning "Brause du Freiheitssang." It is certainly one of the most spirited odes in modern German lyric poetry. Whilst in America Follen wrote a German grammar and reader. His wife Eliza Lee (1787–1860), an American authoress of some reputation, published after his death his lectures and sermons, with a biography written by herself (5 vols., Boston, 1841).

FOLLETT, SIR WILLIAM WEBB (1798–1845), attorney-general of England, was born at Topsham in Devonshire, December 2, 1798. He was the son of Captain Benjamin Follett, who had retired from the army in 1790, and engaged in business at Topsham. His mother was an Irish lady of Kinsale. The early indications which he gave of superior abilities induced his father to bring him up for the bar. He received his early education at Exeter grammar-school, of which Dr. Lempriere, author of the well-known *Classical Dictionary*, was then head-master. After a short course of study under a private tutor, he entered, in 1814, Trinity College, Cambridge, and two years later the Inner Temple. In 1818 he took his degree of B.A. without academical honors, and the same year settled in London, becoming a pupil of Godfrey Sykes and Robert Bayley, two of the most eminent special pleaders of the day. He began to practise as a pleader below the bar in 1821, was called to the bar in 1824, and joined the western circuit in 1825. At the very outset his great qualifications were universally recognized, and his rapid rise was assured. He was thoroughly master of his profession, having devoted himself to it with exclusive zeal; and with remarkable quickness of perception he combined a solidity and ripeness of judgment such as are rarely seen in one so young. The statements current soon after his death as to the frequent interruption of his studies by ill health are emphatically contradicted by Lord Brougham. His rapid and continuous success was owing not only to his unquestionable superiority, but to his singular courtesy, kindness, and sweetness of temper. In 1830 he married the eldest daughter of Sir Ambrose Harding Gifford, chief justice of Ceylon. His reputation in Westminster Hall being solidly established, he sought in 1832 an entrance into parliament, and offered himself as candidate for the city of Exeter on the Conservative side. On this occasion he failed; but in 1835 he was returned for the same city at the head of the poll. In parliament he early succeeded in gaining the ear of the house, and attained a position of high distinction. Under the first administration of Sir Robert Peel, Follett was appointed solicitor-general (November, 1834), but resigned with the ministry in April, 1835. In the course of this year he was knighted. On the return of Peel to power in

1841 Sir William was again appointed solicitor-general, and in April, 1844, he succeeded Sir Frederick Pollock as attorney-general. But his health, which had begun to fail him in 1838, and had been permanently injured by a severe illness in 1841, now broke down, and he was compelled to relinquish practice and to visit the south of Europe. He returned to England in March, 1845; but the disease, consumption, reasserted itself, and he died in London on the 28th of June following. His death was mourned as a loss not only to the profession but to his country, and the public esteem for his character was marked by the attendance at his funeral in the Temple Church of many distinguished persons,—the lord chancellor, the first lord of the treasury, and the chief justice of the common pleas being among the pall-bearers. A noble statue of Follett, executed by Behnes, was erected by subscription it St. Paul's cathedral. (See Brougham's notice of Follett, *Works*, vol. iv.)

FONBLANQUE, ALBANY WILLIAM (1793-1872), was descended from a noble French Huguenot family, the Greniers of Languedoc. The titles of Comte de Hautserre et de Fonblanque were conferred by Henry IV. on the sons of the famous Sieur Pierre de Grenier, known in history by his gallant defence of the castle of Cessenan against the Duc de Montmorenci in 1584. After the revocation of the edict of Nantes, the Greniers underwent severe persecutions on account of their devotion to the Huguenot cause; and in 1740, Abel de Grenier, Comte de Fonblanque, sent his two sons, Antoine and Jean, to England that they might be educated in the Protestant faith. John became nationalized in this country under the name of Fonblanque; and his son, John Samuel Martin Fonblanque, a distinguished equity lawyer, and the author of a standard legal work, a *Treatise on Equity*, became the father of the most brilliant journalist of his day. The father of Albany Fonblanque was, like his son, a staunch Liberal; he represented the borough of Camelford in parliament; and throughout his career was remarkable for the integrity and courage, as well as for the ability, with which he supported Liberal principles.

The subject of the present notice was born in London in 1793. At fourteen he was sent to Woolwich to prepare for the Royal Engineers. His health, however, failed, and for two years his studies had to be suspended. Upon his recovery, he studied for some time with Chitty, the eminent special pleader, with a view to being called to the bar. Fonblanque had no inclination for law, but he valued very highly the course of training he thus obtained, and in after life maintained that a study of law should be included in a liberal education. At the age of nineteen (1812) he commenced writing for the newspapers, and very soon attracted notice both by the boldness and liberality of his opinions, and by the brilliance of his style. Fonblanque's manner of working might have lent some color to the definition of genius as an infinite capacity for taking trouble. His nephew, Mr. Edward Fonblanque, to whose biography we are indebted for the details given in this notice, tells us that in his earlier days he frequently wrote an article ten times before sending it to press, and this not from timidity or anxiety, for from the first his popularity was assured, but because his own ideal of political thought and composition was infinitely higher than that of the public.

As a result of this arduous and earnest cultivation he soon obtained sufficient popularity as a journalist to be able to renounce all idea of following law as a profession; but at the same time that he was eagerly taking his share in all the political struggles of this eventful period, he was also continuing his studies, devoting no less than six hours a day to the study of classics and political philosophy. Under this severe mental training his health once more broke down. At the age of twenty-one he had a long and dangerous illness, and continued weak and subject to nervous depression for the remainder of his life. His energy, however, was not impaired. He became a regular contributor to the newspapers and reviews, realizing a fair income, which, as his habits were simple and temperate, secured him against pecuniary anxieties. From 1820 to 1830 Albany Fonblanque was successively employed upon the staff of the *Times* and the *Morning Chronicle*, whilst he contributed to the *Examiner*, to the *London Magazine*, and to the *Westminster Review*. In 1828 the *Examiner* newspaper, which had been purchased by the Rev. Dr. Fellowes, the learned and amiable author of the *Religion of the Universe*, etc., was given over to Fonblanque's complete control; and for a period of seventeen years (1830 to 1847) he not only sustained the high character for political independence and literary ability which the *Examiner* had gained under the direction of Leigh Hunt and his brother John Hunt, but even compelled his political opponents to acknowledge a certain delight in the boldness and brightness of the wit directed against themselves. When it was proposed that the admirers and supporters of the paper should facilitate a reduction in its price by the payment of their subscription ten years in advance, not only did Mr. Edward Bulwer (Lord Lytton) volunteer his aid, but also Mr. Disraeli and Mr. Clay, M.P., who were thus voluntarily prolonging the reign and spreading the influence of the representative Radical organ. But the *Examiner* under the direction of Fonblanque did not confine itself to the sphere of politics; the fine arts, literature, and the drama occupied a due share of its attention. Amongst its contributors were such men as Thackeray, Marmion Savage, John Stuart Mill, Walter Savage Landor, Charles Dickens, etc., names which do not belong exclusively to any political party, but which, associated in the work of criticism, give firm assurance that the "discovery of the best that is known and thought in the world" (Mr. Arnold's admirable definition of the true function of literary criticism) was for once at any rate in competent and impartial hands. During his connection with the *Examiner*, Fonblanque had many advantageous offers of further literary employment; but he devoted his energies and talents almost exclusively to the service of the paper he had resolved to make a standard of literary excellence in the world of journalism. Whatever he wrote was as carefully prepared and revised as when he was only an aspirant to fame; every reference made and every anecdote used as an illustration he was careful to verify, and in Mr. E. Fonblanque's biography of his distinguished relative are given several racy answers he received from Count d'Orsay and others, concerning some witty story or saying which had taken his fancy, but which he was too scrupulous to repeat from memory. Fonblanque was offered the governorship of Nova Scotia; but although he took great interest in colonial matters, and had used every effort to advocate the more generous political system which had colonial self-government for its goal, he decided not to abandon his beloved *Examiner* even for so sympathetic an employment. In 1847, however, domestic reasons induced him to accept the post of Statistical Secretary of the Board of Trade. This of course compelled him to resign the editorship of the *Examiner*, but he still continued to contribute largely to the paper, which, under the control of John Forster, continued to sustain its influential position. During the later years of his life, Fonblanque took no prominent part in public affairs; and when he died at the age of seventy-nine (1872) he seemed, as his nephew rightly observes, "a man who had lived and toiled in an age gone by and in a cause long since established." The present generation, in the full enjoyment of those reforms he had labored so bravely and unweariedly to promote, found it difficult to realize how much had been effected by Liberals of the stamp of Albany Fonblanque, in days not so remote from our own after all, before the passing of the Reform Act, when, to quote his own words—"The Test Acts were unrepealed; the Catholics were excluded from the legislature; slavery existed in our colonies; the prestige of the perfection of the law was unbroken, and the sanguinary character of the criminal code unmitigated; the corporations were sinks of corruption; a few individuals nominated nearly half the members of the House of Commons; and a parliamentary reformer was in common acceptation another word for a visionary."

The character of Albany Fonblanque's political activity may be judged of by a study of his *England under Seven Administrations*, in comparison with the course of social and political events in England from 1826 to 1837. Although these volumes contain only articles reprinted from the *Examiner*, they give a vivid and spirited history of one of the most important and stormy phases of Parliamentary Reform. Fonblanque, although an ardent upholder of popular rights and an uncompromising opponent of bigotry and oppression, will never be found upon the side of violence or license. The Chartists received from no source more complete condemnation than from the *Examiner*, which consistently advocated the principle that moral force was in every case to be relied upon, and that the liberties of the constitution were to be enlarged by means which were also constitutional. "In describing Lord Durham's politics," says Mr. Edward Fonblanque, "he unconsciously depicted himself. He was not a reformer of the republican class, but he occupied as it were the frontier line of constitutional reform." In a word, Fonblanque was an honorable example of the constitutional Radical who follows after liberty, but uses the pathway of the law. As a journalist, he must also be regarded in the light of a reformer. Journalism before his day was regarded as a somewhat discreditable profession; men of true culture were shy of entering the hot and dusty arena lest they should be confounded with the ruder combatants who fought there before the public for hire. But the fact that Fonblanque, a man not only of strong and earnest political convictions but also of exceptional literary ability, did not hesitate to choose this field as a worthy one in which both a politician and a man of letters might usefully as well as honorably put forth his best gifts, must have helped, in no small degree, to correct the old prejudice.

Life and Labors of Albany Fonblanque, edited by his nephew, Edward Barrington de Fonblanque, 1874; *England under Seven Administrations*, by Albany Fonblanque, 1837. (J. MA.)

FOND DU LAC, a city of the United States, capital of Fond du Lac county, Wisconsin, is beautifully situated on a rising ground at the southern end of Lake Winnebago, 63 miles N.W. of Milwaukee. Railways radiate from it in various directions, and its situation on Winnebago lake gives it access to a wide district of inland navigation. It has a considerable shipping trade in wood, hay, and cattle, and possesses a large tannery, foundries, sawmills, cigar factories, carriage and wagon factories, and a railway-car factory. The water supply is obtained chiefly from artesian wells, which vary in depth from 90 to 130 feet. The population in 1860 was 5400, and in 1870, 12,764.

FONDI, the ancient *Fundi*, a town of Italy in the province of Caserta, about 11 miles N.W. of Gaeta. Its principal street lies along the Appian way, and portions of its old polygonal or Cyclopean walls are still in good preservation. The castle, now in a sadly dilapidated condition, is of interest for its connection with the Colonna family, and the Dominican convent contains a chapel which was occupied as a cell by Thomas Aquinas, and an orange-tree said to have been planted by the saint. The church of Santa Maria is a building in the Italian Gothic style, much disfigured in the interior. Between the town and the sea lies the Lago de Fondi or *Lacus Amyclanus*, in the midst of a marshy tract which has recently been greatly diminished by draining; and near this is a cave, where, according to Tacitus, Sejanus saved the life of Tiberius. The district was in ancient times famous for its wine, including the Ager Cæcubus, which gave its name to the Cæcuban of the Latin poets. Population in 1871, 6632.

Fundi was probably at first a Volscian town. Its citizens were rewarded in 190 B.C. with full Roman citizenship, and enrolled in the Æmilian tribe. Under Augustus it received a colony of veterans. In the time of the barbarian invasions it suffered severely, more especially from the Saracens in 845. The election of the anti-pope Clement VII. took place in the town in 1378, and in 1534 it was attacked and plundered by the Turkish corsair Barbarossa, who was anxious to capture the beautiful countess Giulia Gonzaga as a present for the sultan.

FONT (Lat. *fons*, It. *fonte*, Fr. *fonts*), the vessel used in churches to hold the water for Christian baptism. The modes of administering baptism have varied at different periods of the existence of the Christian churches, causing corresponding changes in the forms and auxiliaries of the receptacle of the consecrated water. There is reason to believe that in the times of the apostles and early missionaries the rite was administered by sprinkling, as whole multitudes of people, and even whole kingdoms, were baptized in one day. But a very general method in early times was no doubt that of total immersion, the catechumens being received by the priest in the water. As Christianity became more general of course fewer adults would present themselves for baptism, and consequently the size of the vessel would not need to be beyond what would allow of the total immersion of an infant. In fact down to the time of the Reformation fonts continued to be made quite large enough to allow of the total immersion of infants, and there is little doubt that down to that date the method was occasionally employed. Baptism by infusion and by aspersion followed this method, though they were no doubt used concurrently, and in a sense combined, for in certain representations of the rite in illuminations and stained glass the infant is represented as seated naked in the font, while from a vessel the priest pours the water upon the head. Originally used only for sick or infirm persons, the method of baptism by infusion became gradually the established practice, and all doubts as to its validity were removed by appeal to papal and other high authority.

In early times the font was placed in the baptistery, a structure often entirely separate from the body of the church, of which the celebrated Baptistery at Florence is the finest example. In these the well or basin for containing the water was usually reached by descending steps. The baptisteries were round, square, octagonal, or crosslike in form, and in design bear the impress of the period to which they belong. Few are found of late date, and the only existing structure at all recalling them in English churches is found at Luton in Bedfordshire. The font at Luton belongs to the Decorated style of English art, and is inclosed in an octagonal structure of freestone, consisting of eight pillars about 25 feet in height, supporting a canopy. The space around the font is large enough to hold comfortably half a dozen people. At the top of the canopy is a vessel for containing the consecrated water, which when required was let down into the font by means of a pipe. The space around the font in the ancient baptisteries was of size to admit several catechumens at the same time; and not only was the whole rite of baptism performed within them, but that of the holy eucharist likewise, and even the baptism of infants. As baptism was administered in early times by bishops only, baptisteries were rare except at the principal church of the diocese. Easter, Whitsuntide, and Epiphany were the principal seasons of its administration. In the 9th century fonts became general in all churches, and baptism was performed at all times by priests of all ranks.

Of fonts still in existence few are older than the 11th century. The material in the Western Church was generally stone, and the outsides and accessories are frequently ornamented with some of the loveliest and most characteristic of the national arts of the Middle Ages. In the Eastern Church it was different. "The font, κολυμβήθρα," says Neale (*Eastern Church*, i. 214), "in the Eastern Church is a far less conspicuous object than it is in the west. Baptism by immersion has been retained; but the font seldom or never possessed any beauty. The material is usually either metal or wood. In Russia the columbethra is movable, and only brought out when wanted." The proper material for fonts in the Western Church was hard stone, as marble, porphyry, or granite. Fonts of bronze and lead are, however, sometimes found, and the basins of many stone fonts were lined with lead to prevent the absorption of the water by the porous stone. A font shaped from one block of oak is in the church at Evenechtyd, Denbighshire. Continental fonts bear distinctly the impress of the time to which they belong. They appear very early, ornamented with bas-reliefs, columns, and arches, as well as with the characteristic details of the ornamentation of their period. Representations of St. John the Baptist are very common. At Pont-à-Mousson on the Moselle, one bears bas-reliefs of that saint preaching in the wilderness, and of the baptism of Christ, executed with that simple sincerity which is more valuable than the highest refinement and finish in design and execution. In the 11th and 12th centuries cup-shaped and cylindrical forms were most common, either as simple cylinders and truncated cones or supported by one or more pillars. Frequently the basin is hollowed out of one large square or oblong slab, supported at the centre by a broad column, with auxiliary columns at the corners, all bearing the mouldings and ornaments characteristic of the period. Caryatids sometimes take the place of the pillars, and sculptured animals and other grotesques of curious design sometimes form the bases. Octagonal forms are not altogether absent from this period, and even hexagons have been occasionally found. Pentagons are very rare. The font, however, at Cabourg, on the north coast of France, is formed of a pentagonal block rather bare of ornamentation, and supported by a group of columns. In the 13th century octagonal forms became more prevalent, although the earlier kinds were not discontinued.

The very remarkable font at Hildesheim in Hanover belongs to the 13th century, and is in complete preservation. The basin rests upon the shoulders of four kneeling figures, each bearing a vase from which water is running, emblematic of the four rivers of Paradise. Above is an inscription which explains the connection of these rivers with the virtues temperance, courage, justice, and prudence. On the sides of the cup itself are bas-reliefs representing the Passage of the Jordan, the Passage of the Red Sea, the Baptism of Christ, and the Virgin and Child. These are separated by columns, by scrolls bearing inscriptions, and by medallions with figurative heads of the abstract virtues named above, and with heads of the prophets. The font has a conical lid, similarly ornamented, and bearing also four bas-reliefs. A cast of this font is now in the South Kensington Museum. At Mayence the font, which belongs to about the year 1328, is of lead, and bears images of the Saviour, the Virgin, St. Martin, and the Twelve Apostles.

Cylindrical fonts become much more rare in the 14th century, the almost universal shape being the octagon. In the 15th and 16th centuries the most elaborate and remarkable of Continental fonts were produced, and some are indeed works of the highest art in sculpture. This superiority is probably more due to increased delicacy and moderation of design, than to any great change in the shape or in the mode of attaching ornament. In early fonts, though the exterior is polygonal, the cup itself is generally circular; but it is characteristic of the 15th century fonts that the octagonal form is carried out even in the cup. The fonts at Strasburg, Freiburg, and Basel are examples of this. Few if any English fonts date from before the Conquest, but a great number of Norman fonts, perhaps more than of any other period before the Reformation, are still in existence, and form some of the most characteristic of the architectural remains of the time. In form circular or square, they are generally supported on one or more columns, and are ornamented with bas-reliefs, net-work of columns and arches, grotesques, rude foliage, niches with figures, and many other forms. Good examples of Norman fonts may be seen at Lincoln Cathedral; Iffley, Oxon; Newenden, Kent; Coleshill, Warwickshire; East Meon, Hants; and Castle Frome, Herefordshire. In the Late Norman and Early English periods, octagonal fonts became common, and with few exceptions this form continued in use until the Reformation. Early English fonts are comparatively rare. They bear the moulding, foliage, and tooth ornament in the usual style of the period. A good example of an Early English font is at All Saints, Leicester; others may be seen at St. Giles, Oxford, and at Lackford, Suffolk. Fonts of the Decorated period are also less common than those of the precedent Norman or subsequent Perpendicular periods, but are superior in detail and execution to those of any other stage of our art. Fonts of the Perpendicular period are very common, and are generally raised upon steps, which, together with the body of the font, are frequently richly ornamented with panelling. It was also the custom during this period to ornament the font with shields and coats of arms, and other heraldic insignia, as at Herne, Kent.

Leaden fonts of Norman date are found at Dorchester, Oxon, at Avebury, Wilts, and other places. In Holyrood Chapel there was a brazen font in which the royal children of Scotland were baptized. It was carried off in 1544 by Sir R. Lea, and given by him to the church at St. Alban's, and was afterwards destroyed by the Puritans. A silver font was at Canterbury, which was sometimes brought to Westminster on the occasion of a royal baptism. At Chobham, Surrey, there is a leaden font covered with oaken panels of the 16th century.

In 1236 it was ordered by Edmund, archbishop of Canterbury, that baptismal fonts should be kept under lock and key, as a precaution against sorcery: "Fontes baptismales sub sera clausi teneantur propter sortilegia." The lids appear at first to have been quite simple and flat. They gradually, however, partook of the ornamentation of the font itself, and are often of pyramidal and conical forms, highly decorated with finials, crockets, mouldings, and grotesques. Some very rich font covers may be seen at Ewelme, Oxon; St. Gregory, Sudbury; North Walsingham, Norfolk; Worlingworth, Suffolk. The ordinary position of the font in the church was near the entrance, usually to the left of the south door.

See Caumont, *Cours d'antiquités monumentales*, Paris, 1830; Simpson, *Series of Antient Baptismal Fonts;* Paley, *Ancient Fonts;* Viollet-le-Duc, *Dict. de l'Architecture*, vol. v.; Parker's *Glossary of Architecture.* (W. HE.)

FONTAINE, JEAN DE LA. See LA FONTAINE.

FONTAINE, PIERRE FRANÇOIS LÉONARD (1762–1853), French architect, was born at Pontoise, September 20, 1762. He was of a family several of whose members had distinguished themselves as architects, and he early showed the taste and the ability which promised to revive in his person the family distinction. Leaving the college of Pontoise at the age of sixteen he was sent to L'Isle-Adam, to assist in hydraulic works undertaken by the architect André. To facilitate his improvement André allowed him to have access to his plans and to copy his designs. At this time he formed a friendship with another young student of his art, Thibaut, whose passion quickened his own. In October, 1779, he was sent to Paris to study in the school of Peyre the younger, and there began his acquaintance with Percier, which ripened into a life-long friendship. After six years of study he competed for a prize at the Academy, and, winning the second, received a pension and was sent to Rome (1785). Percier accompanied him. The Revolution breaking out soon after his return to France, he took refuge in England; but after the establishment of the consulate, he was employed by Bonaparte to restore the palace of Malmaison. Henceforth he was fully engaged in the principal architectural works executed in Paris, as architect successively to Napoleon I., Louis XVIII., and Louis Philippe. In conjunction with Percier (till his death) he was employed on the Arch of the Carrousel, the restoration of the Palais-Royal, the grand staircase of the Louvre, and the works projected for the union of the Louvre and the Tuileries. In 1812 he was admitted a member of the Academy of Fine Arts, and in 1813 was named first architect to the emperor. With Percier he published the following works,—*Palais, Maisons, et autres Édifices Modernes dessinés à Rome* (1798); *Description des Fêtes et Cérémonies du Mariage de Napoléon et de Marie Louise* (1810); and *Recueil de Décorations Intérieures* (1812). Fontaine lost his friend and associate Percier in 1838, and died himself at Paris, October 10, 1853.

FONTAINEBLEAU, a town of France, at the head of an arrondissement, in the department of Seine-et-Marne, about 37 miles S.E. from Paris on the railway to Lyons, in 48° 24′ 23″ N. lat. and 2° 42′ 1″ E. long. It stands in the midst of the forest of Fontainebleau, is well built, and has broad, clean, handsome streets. Among the more important buildings and institutions are the hôtel de ville, the barracks, the court-house, two hospitals, a college, and a public library. The Pompadour mansion, and a portion of that which belonged to the cardinal of Ferrara, are still preserved; and a statue of General Damesme adorns the principal square. Wood-turning and the manufacture of porcelain and earthenware are the chief industries; and wine, grapes, garden produce, and paving-stones are articles of export. The population in 1871 was 11,545. In the immediate vicinity of the town is the celebrated palace of Fontainebleau—one of the largest, and in the interior one of the most sumptuous, of the royal residences of France. The origins of the name and of the building are equally unknown; but the old manor-house was used by Louis VII. in the latter part of the 12th century, and continued a favorite residence of Philip Augustus and St. Louis. The existing edifice was begun by Francis I., who laid out immense sums of money in its erection, employing Primaticcio, a famous Italian architect, to draw the plans, and commissioning Leonardo da Vinci, Andrea del Sarto, and Benvenuto Cellini to expend the resources of their arts in making it a truly royal residence. Henry IV. doubled the area of the buildings and gardens, adding, among other portions, the great Diana gallery, the Court of the Princes, and the Galerie des Cerfs. A canal which he constructed was afterwards filled up by Louis XIV. With Louis XV. the palace fell into disfavor, and for a time it was used as a military school. Napoleon I. restored it with great splendor, at a cost of 6 million francs, and often resided in it; but after the return of the Bourbons it was again allowed to fall into disrepair. Louis XVIII. and Louis Philippe both did somewhat to its restoration. The congeries of buildings is very extensive, the roofing, it is said, covering no less than 14 acres. There are five great courts, distinguished as the Court of the White Horse, the Court of the Fountain, the Oval or Donjon Court, the Court of Princes, and the Court of the Kitchens or of Henry IV. The first is also called the Court of Adieux, in memory of the parting scene between Napoleon and his Old Guard in 1814, at the foot of the Horse Shoe staircase. The chapel of the Holy Trinity was built under Francis I., and the chapel of St. Saturnin dates from the same period, and occupies the site of an older building which was consecrated by Thomas à Becket. It is impossible to do more than mention a few of the historical events which have taken place at Fontainebleau. Philip the Fair, Henry III., and Louis XIII. were all born in the palace, and the first of these kings died there. James of Scotland was there received by his intended bride; and Charles V. of Germany was entertained there in 1539. Christina of Sweden lived there for years, and the gallery is still shown where she caused her secretary Monaldeschi to be murdered, or, as she regarded it, executed. In 1685, Fontainebleau saw the signing of the revocation of the edict of Nantes, and in the following year the death of Condé. In the 18th century it had two illustrious guests in Peter the Great of Russia and Christian VII. of Denmark; and in the early part of the 19th it was twice the residence of Pius VII.,—in 1804, when he came to consecrate the emperor, and in 1812–1814, when he was that emperor's prisoner. It was within its walls that the sentence of divorce was passed against Josephine. The forest of Fontainebleau is one of the most beautiful wooded tracts in France, and for generations it has been the chosen haunt of French landscape painters. The most celebrated spots are the Vallé de la Solle, the Gorge au Loupe, the Gorge d'Apremont, and the Fort l'Empereur. The whole area extends to 81,740 acres, and it is traversed by 12,000 miles of road and pathway.

See Pfnor, *Monographie de Fontainebleau*, with text by Champollion Figeac, Paris, 1866.

FONTANA, Domenico (1543–1607), Italian architect and mechanician, was born at Mili, a village on the lake of Como, in 1543. After a good training in mathematics, he went in 1563 to join his elder brother, then studying architecture at Rome. He made rapid progress, and was taken into the service of Cardinal Montalto, for whom he erected a chapel in the church of Santa Maria Maggiore and the villa Negroni. When the cardinal's pension was stopped by the pope, Gregory XIII., Fontana volunteered to complete the works in hand at his own expense. The cardinal being soon after elected pope, under the name of Sixtus V., he immediately appointed Fontana his chief architect. Amongst the works executed by him were the Lateran Palace, the palace of Monte Cavallo (the Quirinal), the Vatican Library, etc. But the undertaking which brought Fontana the highest repute was the removal of the great Egyptian obelisk, brought to Rome in the reign of Caligula, which was lying in the circus of the Vatican, and its erection in front of St. Peter's. This he accomplished in 1586. After the death of Sixtus V., charges were brought against Fontana of misappropriation of public moneys, and Clement VIII. dismissed him from his post (1592). This appears to have been just in time to save the Colosseum from being converted by Fontana into a huge cloth factory, according to a project of Sixtus V. Fontana was then called to Naples, and accepted the appointment of architect to the viceroy, the count of Miranda. At Naples he built the royal palace, constructed several canals, and projected a new harbor and bridge, which he did not live to execute. The only literary work left by this architect is his account of the removal of the obelisk, 1589. He died at Naples in 1607, and was honored with a pompous funeral in the church of St. Ann.

FONTANA, Lavinia (1552–1614), daughter of Prospero (see below), was a painter of no little fame, especially in portraits. She was greatly employed by the ladies of Bologna, and, going thence to Rome, painted the likenesses of many illustrious personages, being under the particular patronage of the family (Buoncampagni) of Pope Gregory XIII., who died in 1585. The Roman ladies, from the days of this pontiff to those of Paul V., elected in 1605, showed no less favor to Lavinia than their Bolognese sisters had done; and Paul V. was himself among her sitters. Some of her portraits, often lavishly paid for, have been attributed to Guido. In works of a different kind also she united care and delicacy with boldness. Among the chief of these are a Venus in the Berlin Museum; the Virgin lifting a veil from the sleeping infant Christ, in the Escorial; and the Queen of Sheba visiting Solomon. Her own portrait in youth—she was accounted very beautiful—was perhaps her masterpiece; it belongs to the Counts Zappi of Imola, the family into which Lavinia married. She is deemed on the whole a better painter than her father; from him naturally came her first instruction, but she gradually adopted the Caraccesque style, with strong quasi-Venetian coloring. She was elected into the Academy of Rome, and died in that city in 1614.

FONTANA, Prospero (1512–1597), a painter, was born in Bologna, and became a pupil of Innocenzo da Imola. He afterwards worked for Vasari and Pierino del Vaga. It was probably from Vasari that Fontana acquired a practice of offhand, self-displaying work. He undertook a multitude of commissions, and was so rapid that he painted, it is said, in a few weeks an entire hall in the Vitelli Palace at Città di Castello. Along with daring, he had fertility of combination, and in works of parade he attained a certain measure of success, although his drawing was incorrect, and his mannerism palpable. He belongs to the degenerate period of the Bolognese school, under the influence chiefly of the imitators of Raphael—Sabbatini, Sammachini, and Passerotti being three of his principal colleagues. His soundest successes were in portraiture, in which branch of art he stood so high that towards 1550 Michelangelo introduced him to Pope Julius III. as a portrait-painter; and he was pensioned by this pope, and remained at the pontifical court with the three successors of Julius. Here he lived on a grand scale, and figured as a sort of arbiter and oracle among his professional brethren. Returning to Bologna, he opened a school of art, in which he became the preceptor of Lodovico and Agostino Caracci; but these pupils, standing forth as reformers and innovators, finally extinguished the academy and the vogue of Fontana. His subjects were in the way of sacred and profane history and of fable. He has left a large quantity of work in Bologna,—the picture of the Adoration of the Magi, in the Church of S. Maria delle Grazie, being considered his masterpiece—not unlike the style of Paul Veronese. His death took place in Rome in 1597.

FONTANES, Louis, Marquis de (1757–1821), French poet and politician, was born at Niort, in Poitou, March 6, 1757. He was a descendant of a noble Protestant family of Languedoc, banished by the revocation of the edict of Nantes, but afterwards converted to the Catholic faith and restored to their native land. Having completed his education at the college of Niort, he went in 1777, after the death of his father and brother, to Paris. He had already made several attempts in verse; and in 1778 he published a short descriptive poem entitled *La Forêt de Navarre.* This procured him the notice and friendship of Ducis, and he was encouraged to persevere. During the next twelve years he published *Le Cri de mon Cœur: Le Jour des Morts dans une Campagne*, an imitation of Gray's *Elegy;* a translation of Pope's *Essay on Man* (1783), with an elegant introduction which attracted more attention than the poem itself; *Le Verger; La Chartreuse de Paris;* and *L'Essai sur l'Astronomie* (1789). In this year appeared also his *Épître sur l'Édit en Faveur des non-Catholiques*, which was crowned by the Academy. The Revolution converted the poet into a journalist, and he took part in the editorship of the *Mercure François* and the *Moderateur.* Compelled to leave Paris after the death of the king, he withdrew to Lyons, where he married and remained till the arrival of Collot d'Herbois in 1793. Driven again to lead a wandering life, he displayed at once his literary power, his patriotism, and his intrepidity in the eloquent petition on behalf of the Lyonnese victims of Collot d'Herbois and his colleagues, which was presented to the Convention in December of that year. For this bold appeal he was proscribed, and he owed his protection in concealment to the friendship of Madame Dufresnoy. After the fall of Robespierre, Fontanes was appointed professor of belles lettres at the central school, and admitted a member of the Institute. About the same time he was associated with La Harpe in the conduct of the *Mémorial.* For one of his articles he was condemned to banishment by the Directory and expelled from the Institute. He escaped to England, and there renewed his acquaintance with Chateaubriand, also an exile. Returning to France after the 18th Brumaire, he was soon after commissioned by the first consul to write the funeral oration on Washington, and this opened a new chapter in his life. Bonaparte, satisfied with the *Éloge*, admitted Fontanes to frequent intercourse with him;

he was soon reinstated at the Institute, and became a member of the legislative body, of which in 1804 he was made president. He was also one of the first members of the Legion of Honor; and in 1808 he was made grand master of the university. Fontanes was censured by the republican party for alleged servility to the emperor; but apparently without reason. He was created count, and in 1810 was called to the senate. He voted for the deposition of Napoleon, retained his offices under the provisional government, and was made a peer by Louis XVIII. In February, 1815, the post of grand master of the university was suppressed, and Fontanes was promoted grand cordon of the Legion of Honor. He remained passive during the Hundred Days, and after the second restoration of the Bourbons was made a privy councillor. The title of marquis was conferred on him in 1817. In January, 1821, he was chosen president of the Société des Bonnes Lettres; but his health had long been declining, and he died at Paris on the 17th of March of that year. He left unfinished a poem entitled *La Grèce Delivrée*, of which high expectations had been formed. A collected edition of the works of Fontanes was first published by Sainte-Beuve, with a critical and biographical memoir, in 1837.

FONTARABIA. See FUENTERRABIA.

FONTENAY-LE-COMTE, the chief town of an arrondissement in the department of Vendée, France, is situated on both sides of the river Vendée at the point where it becomes navigable, 35 miles S.E. of La Roche-sur-Yon (Napoléon Vendée). The town has an antique and straggling appearance, but there are some good houses in the suburbs. It possesses a communal college, a prison, a hospital, a theatre, the remains of an old castle which formerly belonged to the counts of Poitiers, and two old and beautiful churches, Notre Dame and St. John. Both are of Romanesque architecture, terminated with Gothic spires, the spire of Notre Dame being 311 feet in height. The principal industries are the manufacture of coarse linen and woollen cloths, brewing and tanning; and there is a considerable trade in wine, fruits, timber, hemp, flax, and cattle.

Fontenay occupies the site of an old Roman town. It was captured by the English in 1361, and during the wars of the Huguenots it was ten times besieged. Louis XIII. in 1621 ordered the demolition of its fortifications, and in 1649 during the rebellion against the parliament, it fell into the hands of the nobles of Poitou. In the time of the Revolution it was called Fontenay-le-Peuple. Population in 1876, 7309.

FONTENELLE, BERNARD LE BOVIER DE (1657–1757), author of the *Dialogues des Morts*, *Entretiens sur la Pluralité des Mondes*, etc., was born at Rouen on the 11th of February, 1657, and died at Paris on the 9th of January, 1757, having thus very nearly attained the age of 100 years. His father was an advocate settled in Rouen, his mother a sister of the great Corneille. He was educated at the college of the Jesuits in his native city, and distinguished himself by the extraordinary precocity, as well as the amazing versatility, of his talents. His teachers, who readily appreciated these, were anxious to allure him into their order, but his father had designed him for the bar, and an advocate accordingly he became; but, having lost the first cause which was entrusted to him, he soon abandoned law in disgust and gave himself wholly to literary pursuits. His attention was first directed to poetical composition; and more than once he competed for the poetry prizes of the French Academy, but never with success. He had also the sorrow of witnessing, in 1680, the total failure of his tragedy *Aspar*, a failure which was all the more mortifying because, for the purpose of annoying Racine, Thomas Corneille had previously sounded forth in the *Mercure* the praises of his nephew as the most gifted of all the younger dramatists. Fontenelle afterwards acknowledged the justice of the public verdict by burning his unfortunate drama, of which nothing but the name now survives. But for several years he persisted in the belief that poetry was his true vocation, and continued to produce dramatic compositions, the mediocrity of which, considering the author's real talent, is positively astonishing. His opera of *Thétis et Pélée*, though highly praised by Voltaire, cannot be said to rise much above the others; and it is significant that of all his dramatic works, not one has kept the stage. His *Poésies Pastorales* have no greater claim to permanent repute, being characterized by stiffness and affectation; and the utmost that can be said for his poetry in general is that it displays much of the *limæ labor*, great purity of diction, and occasional felicity of expression. It was by his *Dialogues des Morts*, published in 1683, that Fontenelle first established a genuine claim to high literary rank; and that claim was very much enhanced three years later by the appearance of the *Entretiens sur la Pluralité des Mondes*, a work which was among the very first to illustrate the possibility of being scientific without being either uninteresting or unintelligible to the ordinary reader. It was precisely the kind of work which Fontenelle was capable of executing well, both from the natural bent of his intellect and from the course of his previous studies. His object was to popularize among his countrymen the astronomical theories of Descartes; and it may well be doubted if that philosopher ever ranked a more ingenious or successful expounder among the number of his disciples. Hitherto Fontenelle had continued to reside in Rouen, but in 1687 he removed to Paris for permanent residence there; and in the same year he published his *Histoire des Oracles*, a book which made a considerable noise in the theological as well as in the philosophical world. It was not so much an original work as a reduction from the Latin of Van Dale, and consisted of two essays, the first of which was designed to prove that oracles were not given by the supernatural agency of demons, and the second, that they did not cease with the birth of Christ. The clearness and precision of the style, and the smooth flow of the reasoning in this treatise, have been always much admired. It excited the suspicion of the church, however, and a Jesuit, by name Baltus, published a ponderous refutation of it; but the peace-loving disposition of its author impelled him to leave his opponent unanswered. He was too busy, he wrote to Leclerc, and added, "Enfin, je n'ai point du tout l'humeur polémique, et toutes les querelles me déplaisent. J'aime mieux que le diable ait été prophète, puisque le père jésuite le veut, et qu'il croit cela plus orthodoxe." To the following year (1688) belongs his *Digression sur les Anciens et les Modernes*, in which he took the modern side in a somewhat unnecessary controversy then raging; his *Doutes sur le Système Physique des Causes Occasionelles* (against Malebranche) appeared shortly afterwards. In 1691 he was received into the French Academy in spite of the determined efforts of Racine and Boileau, who on four previous occasions had secured his rejection. He subsequently was admitted a member both of the Academy of Inscriptions and of the Academy of Sciences; and in 1699 he became perpetual secretary to the latter body. This office he actually held for the long period of forty-two years; and it was in this official capacity that he wrote the *Histoire de l'Académie des Sciences*, containing extracts and analyses of the proceedings, and also the *Éloges* of the members. These last are written with great simplicity and delicacy; while of the prefaces to the *Histoire*, Saint-Beuve declares that in them "il à atteint à une véritable perfection, encore agréable et presque sévère." The only other works of Fontenelle that require to be mentioned are his *Géométrie de l'Infini* and his *Apologie des Tourbillons*. Of the former, his Academy composition, he himself is reported to have said (so far justly) —"There, now, is a book which only eight men in Europe can understand, and the author is not one of the eight." Fontenelle forms a link of connection between two very widely different periods of French literature, that of Corneille, Racine, and Boileau on the one hand, and that of Voltaire, D'Alembert, and Diderot on the other. It is not in virtue of his great age alone that this can be said of him; he actually had much in common with the *beaux esprits* of the 17th century, as well as with the *philosophes* of the 18th. But it is to the latter rather than to the former period that he properly belongs; and it is not a little significant that while as a poet and man of fashion he was "the butt of all the clever men in Paris" during the first fifty years of his life, he latterly came to be "a force and an authority in the intellectual life" of the period. He has no claim to be regarded as a genius; but, as Sainte-Beuve has said, he well deserves a place "dans la classe des esprit infiniments distingués"—distinguished, however, it ought to be added by intelligence rather than by intellect, and less by the power of saying much than by the power of saying a little well. In personal character he has sometimes been described as having been revoltingly heartless; and it is abundantly plain that he was singularly incapable of feeling strongly the more generous emotions—a misfortune, or a fault, which revealed itself in many ways. "Il faut avoir de l'âme pour avoir du gout." But the cynical expressions of such a man are not to be taken too literally; and the mere fact that he lived and died in the esteem of many friends suffices to show that the theoretical selfishness which he sometimes professed cannot have been consistently and at all times carried into practice.

There have been several collective editions of Fontenelle's works. The best are those of Paris, in 8 vols. 8vo, 1790, and 5 vols. 8vo, 1825. Some of his separate works have been very frequently reprinted and also translated. The *Pluralité des Mondes* was translated into modern Greek in 1794. Sainte-Beuve has an interesting essay on Fontenelle, with several useful references, in the *Causeries du Lundi*, vol. iii.

FONTEVRAULT, or FONTEVRAUD, in Latin *Fons Ebraldi*, a town of France, with a population of about 2500, in the department of Maine-et-Loire, 10 miles S.E. of Saumur, and 2 miles from the confluence of the Loire and Vienne. It is situated in the midst of a forest district, and the inhabitants carry on various minor industries fostered by the timber trade. The interest of the place centres in its abbey, which since 1804 has been utilized and abused as a central house of detention for convicts. In spite of mutilation and "translation" the building remains a fine example of the architecture of the 12th century. The church, of which only the choir and apse are appropriated to divine service, has a beautiful nave covered by four cupolas. In a chapel in the south transept are the effigies of Henry II. of England and his wife Eleonora of Guienne, and of Richard the Lion Heart and his wife Isabella of Angoulême—Eleanora's being of oak and the rest of stone. The second court of the abbey contains a remarkable building, which long went under the misnomer of *chapelle funéraire*, but was in reality the old kitchen. Details and diagrams will be found in Viollet-le-Duc's *Dictionnaire de l'Architecture*. There are three stories, of which the first is an octagon, the second a square, and the third an octagon; and the whole is surmounted by a sort of pyramidal structure. Fontevrault was founded about the end of the 11th century by Robert of Arbrissel, who was born in the village of Arbrissel or Arbresec, in the diocese of Rennes, and attained great fame as a preacher and ascetic. It consisted of a nunnery for virgins and widows, a magdaleneum, a hospital for lepers and other diseased folk, a convent, and a church. The church was used both by the monks and the nuns, but no communication was permitted between the two sexes. The order of Fontevrault was recognized by Pascal II. in 1106, and again more expressly by a bull in 1113. It was placed by its founder under the patronage of the Holy Virgin, and entrusted to the superintendence of an abbess, who was supreme not only over the nuns but also over the monks. The first who held the office was Petronella de Craon-Chemillé. The success of the order was so great that at Robert's death it is said there were no fewer than 3000 nuns. It ultimately numbered fifty-seven priories, divided into the four provinces of France, Aquitaine, Auvergne, and Brittany. It continued till the French Revolution, and the abbey of Fontevraud was the usual place to which the princesses of the blood royal of France were sent for their education. The last abbess, Julie Sophie Charlotte de Pardaillan, died at Paris in 1799 in great destitution.

See Édouard, *Fontevrault et ses monuments, ou Histoire de cette royale abbaye depuis sa fondation jusqu' à sa suppression (1100–1793), ornée d'une gravure et des armoiries des abbesses*, 2 vols., 1875.

FOOCHOW. See FUH-CHOW.

FOOD. See DIETETICS.

FOOL. The class of fools, buffoons, or jesters, which reached its culminating point of influence and recognized place and function in the social organism during the Middle Ages, appears to have existed in all times and countries. Not only have there always been individuals naturally inclined and endowed to amuse others; there has been besides in most communities a definite class, the members of which have used their powers or weaknesses in this direction as a regular means of getting a livelihood. Savage jugglers, medicine-men, and even priests, have certainly much in common with the jester by profession. There existed in ancient Greece a distinct class of professed fools whose habits were not essentially different from those of the jesters of the Middle Ages. Of the behavior of one of these, named Philip, Xenophon has given a picturesque account in the *Banquet*. Philip of Macedon is said to have possessed a court fool, and certainly these (as well as court poets and court philosophers, with whom they have sometimes been not unreasonably confounded) were common in a number of the petty courts at that era of civilization. *Scurræ* and *moriones* were the Roman parallels of the mediæval witty fool; and during the empire the manufacture of human monstrosities was a regular practice, slaves of this kind being much in request to relieve the languid hours. The jester again has from time immemorial existed at eastern courts. Witty stories are told of Bahalul (see D'Herbelot, *s.v.*) the jester of Haroun Al Raschid, which have long had a place in Western fiction. On the conquest of Mexico court fools and deformed human creatures of all kinds were found at the court of Montezuma. But that monarch no doubt hit upon one great cause of the favor of monarchs for this class when he said that "more instruction was to be gathered from them than from wiser men, for they dared to tell the truth." Mr. Douce, in his essay *On the Clowns and Fools of Shakespeare*, has made a ninefold division of English fools, according to quality and place of employment, as the domestic fool, the city or corporation fool, the tavern fool, the fool of the mysteries and moralities. The last is generally called the "vice," and is the original of the stage clowns so common among the dramatists of the time of Elizabeth, and who embody so much of the wit of Shakespeare. A very palpable classification is that which distinguishes between such creatures as were chosen to excite to laughter from some deformity of mind or body, and such as were so chosen for a certain (to all appearance generally very shallow) alertness of mind and power of repartee,—or briefly, butts and wits. The dress of the regular court fool of the Middle Ages was not altogether a rigid uniform. To judge from the prints and illuminations which are the sources of our knowledge on this matter, it seems to have changed considerably from time to time. The head was shaved, the coat was motley, and the breeches tight, with generally one leg different in color from the other. The head was covered with a garment resembling a monk's cowl, which fell over the breast and shoulders, and often bore asses' ears, and was crested with a cockscomb, while bells hung from various parts of the attire. The fool's bauble was a short staff bearing a ridiculous head, to which was sometimes attached an inflated bladder, by means of which sham castigations were effected. A long petticoat was also occasionally worn, but seems to have belonged rather to the idiots than to the wits.

The fool's business was to amuse his master, to excite him to laughter by sharp contrast, to prevent the over-oppression of state affairs, and, in harmony with a well-known physiological precept, by his liveliness at meals to assist his lord's digestion. The names and the witticisms of many of the official jesters at the courts of Europe have been preserved by popular or state records. In England the list is long between Hitard, the fool of Edmund Ironside, and Muckle John, the fool of Charles I., and probably the last official royal fool of England. Many are remembered from some connection with general or literary history. Scogan was attached to Edward IV., and under his name Andrew Boorde published a collection of poor jests. Will Sommers, of the time of Henry VIII., seems to have been a kind-hearted as well as a witty man, and occasionally used his influence with the king for good and charitable purposes. Arnim, who, in his *Nest of Ninnies*, gives a full description of Sommers, and introduces many popular fools, says of him—

> "Only this much, he was a poor man's friend,
> And helpt the widow often in her end.
> The king would ever grant what he would crave,
> For well he knew Will no exacting knave."

The literature of the period immediately succeeding his death is full of allusions to Will Sommers. John Heywood was an educated man, a poet and dramatist, as well as jester to Queen Mary. Some of his dialogues have in conception a racy national humor. John Tarleton, famous as a comic actor, cannot be omitted from any list of jesters. A book of Tarleton's *Jests* was published in 1611, and, together with his *News Out of Purgatory*, was reprinted by Mr. Halliwell for the Shakespeare Society in 1844. Archie Armstrong, for a too free use of wit and tongue against Laud, lost his office and was banished the court. The conduct of the archbishop against the poor fool is not the least item of the evidence which convicts him of a certain narrow-mindedness and pettiness. In French history, too, the figure of the court-jester flits across the gay or sombre scene at times with fantastic effect. Caillette and Triboulet are well-known characters of the times of Francis I. Triboulet appears in Rabelais's romance, and is the hero of Victor Hugo's *Le Roi s'amuse*, and, with some changes, of Verdi's opera *Rigoletto;* while Chicot, the lithe and acute Gascon, who was so close a friend of Henry III., is portrayed with considerable justness by Dumas in his *Dame de Monsoreau.* In Germany Rudolph of Hapsburg had his Pfaff Cappadox, Maximilian I. his Kunz von der Rosen (whose features, as well as those of our own Will Sommers, have been preserved by the pencil of Holbein), and many a petty court its jester after jester. Late in the 16th century appeared *Le Sottilissime Astuzie di Bertoldo,* which is one of the most remarkable books ever written about a jester. It is by Giulio Cesare Croce, a street musician of Bologna, and is a comic romance giving an account of the appearance at the court of Alboin king of the Lombards of a peasant wonderful in ugliness, good sense, and wit. The book was for a time the most popular in Italy. A great number of editions and translations appeared, and it was even versified. Though fiction, both the character and the career of Bertoldo are typical of the jester. That the private fool existed as late as the last century is proved by Swift's epitaph on Dicky Pearce, the earl of Suffolk's jester.

See Flögel, *Geschichte der Hofnarren,* Leipsic, 1789; Doran, *The History of Court Fools,* 1858. (W. HE.)

FOOTBALL is a game which consists, as the name implies, in giving motion to a ball with the feet alone. It has been aptly designated the "winter game" of Great Britain, and justly takes the place of cricket from Michaelmas to Lady Day. The ball requires to be larger than in all handball pastimes, in order that it may be easily kicked. This was accomplished in ancient times by inflating a bladder or skin termed *follis.* In Greece the ἐπίσκυρος seems to have borne a resemblance to the modern game. Of this we read in Smith's *Dictionary of Antiquities*—"It was the game at football, played in much the same way as with us, by a great number of persons divided into two parties opposed to one another." Amongst the Romans the *harpastum,* derived from the Greek verb ἁρπάζω, to seize, thus showing that carrying the ball was permissible, bore a certain resemblance. Basil Kennett, in his *Romæ Antiquæ Notitia,* terms this missile a "larger kind of ball, which they played with, dividing into two companies and striving to throw it into one another's goals, which was the conquering cast,"—a description which, if correct, certainly bears a strong resemblance to the modern game of football. The antiquity of football in Great Britain (introduced, there can be little doubt, by the Romans) goes some centuries farther back than cricket, probably because the requisites—only an inflated ball and rude goals—were fewer and simpler than in the summer game. The birthplace of the latter was in the southern counties, that of football in the north. In early times the great football festival of the year was Shrove Tuesday, though the connection of the game with this particular date is lost in obscurity. William Fitzstephen, in his *History of London* (about 1175), speaks of the young men of the city annually going into the fields after dinner to play at the well-known game of ball on the day *quæ dicitur Carnilevaria.* As far as is known this is the first distinct mention of football in England. A clear reference is made "ad pilam . . . pedinam" in the Rotuli Clausarum, 39 Edward III. (1365), memb. 23, as one of the pastimes to be prohibited on account of the decadence of archery, and the same thing occurs in 12 Richard II. c. 6 (1388). Down to the end of the first quarter of the present century Shrove Tuesday continued to be the high festival of football, but it had never taken root, like cricket, amongst the aristocracy and gentry. It was confined to the middle and lower classes. No clubs or code of rules had been formed, and the sole aim seems to have been to drive the ball through the opposing side's goal by fair means or foul. So rough did the game become that James I. forbade the heir apparent to play it, and describes the exercise in his *Basilikon Doron* as "meeter for laming than making able the users thereof." Both sexes and all ages seem to have taken part in it on Shrove Tuesday; shutters had to be put up and houses closed in order to prevent damage; and it is not to be wondered that the game fell into bad repute under such violent horse-play and eccentric usages. Accidents, sometimes fatal, occurred; and Shrove Tuesday "football-day" gradually died out about 1830. For some thirty years football was only practised at the great public schools, at which there were, as still, two distinct forms of play. The Rugby game, so aptly described in *Tom Brown's School Days,* resembles the Roman *harpastum* and the rough Shrove-tide play, since seizing and carrying the ball, charging, and one player's holding another are freely allowed, and actual hacking was abolished at Rugby only as lately as 1877. Harrow and Winchester are the chief exponents of the game wherein kicking alone is allowed as a means of propulsion. Eton plays a hybrid game in two different ways, viz., "At the Wall" and "In the Field," the latter being a sort of mixture of both kinds of play. All other schools have arrayed themselves under one or other of these banners, with slight modifications in their rules. About the year 1860, when the great volunteer movement and the institution of amateur athletic sports gave a zest to many kinds of exercises, there came a revival of football amongst old public school and university men. It was soon found that a universal code of rules and a society to legislate on matters of dispute were necessary. Followers of the strict foot game were the first to recognize these wants, and the "Football Association" was accordingly formed in 1863, the exponents of the other method not banding themselves together till the "Rugby Football Union" was instituted in 1871.

Football has extended most rapidly throughout the United Kingdom during the past few years, as is evinced by the fact of all large towns, villages, and schools now possessing football clubs, and has regularly taken the place of cricket during the winter months. It is a game more adapted to youths than to middle-aged persons, and should not be indulged in after the frame is full-grown and set, when the tumbles and scrimmages incidental to the Rugby code are apt to be baneful. The balls are now made of inflated india-rubber bladders, covered with strong leather laced together, the Rugby balls being elliptical or egg-shaped, and the association ones a perfect sphere.

The two games may be briefly described thus:—

Under the Rugby code a level piece of turf is the scene of action, and fifteen a side the usual number of players—ten "forwards," two "half backs," one "three-quarters back," and two "backs." Each goal is composed of two upright posts, exceeding 11 feet in height, and placed 18½ feet apart, with a cross-bar 10 feet clear from the ground. The choice of goals is decided by lot, the side which wins the choice either availing themselves of any favorable breeze or gradients which may prevail, or electing to play at a disadvantage for the first period of the game till "half time" is called. The game is commenced by the opposite side to that which has choice of goals kicking off the ball (placed on the ground) from midway between the two goals. The object of both sides then is to drive the ball over the cross-bar, and between the line of the two upright posts of their opponents' goal, which achievement constitutes "obtaining a goal." This can be accomplished either by a player's touching the ball down behind his adversaries' goal line, then carrying it out, and thus obtaining a "try" or place kick at goal, or by kicking at goal with a direct drop-kick instantly the ball rebounds from the ground. A match is decided by a majority of goals; if their number be equal, by a majority of ties; and if none of either be obtained, the match is drawn. The other minutiæ are so numerous that no less than sixty rules are required for their regulation.

The intricacies of the Association game are far fewer, and only require a very plain set of thirteen rules. No handling or touching the ball, except by the goal-keeper, is permissible, "dribbling" or kicking with the feet being the sole mode of propulsion. The goal posts are 24 feet apart, and the cross-bar only 8 feet from the ground, the ball in this case having to be driven *under* the latter in order to obtain a goal. "Tries" are unknown, and the gaining of goals is the sole point whereby the game is decided.

The rules of both games will be found in most football works, the chief of which are Routledge's *Handbook of Football,* 1867; C. W. Alcock's *Football Annual,* annually from 1868; Alcock's *Football, our Winter Game,* 1874; G. H. West's *Football Calendar,* annually from 1874. (H. F. W.)

FOOTE, SAMUEL (*c.* 1720–1777), comic dramatist and actor, was born at Truro about the year 1720. Of his attachment to his native Cornwall he gives no better proofs as an author than by making the country-booby Timothy (in *The Knights*) sound the praises of that county and of its manly pastimes; but towards his family he showed a loyal and enduring affection. His father was a man of good family and position; his mother, the daughter of a baronet (Sir Edward Goodere), is said, in person as well as in disposition, to have strongly resembled her famous son. According to tradition, she afterwards fell into pecuniary embarrassments closely analogous to his own; but in the days of his prosperity he liberally supported both her and an unfortunate clerical brother. After her death he indignantly vindicated her character from the imputations recklessly cast upon it by the revengeful spite of the duchess of Kingston. About the time when Foote came of age, a family quarrel between his two maternal uncles ended in the brutal murder, under extraordinary circumstances, of the one by the other, who was, with his accomplices, hanged for the crime. By this event Foote came into his first fortune, through which he ran with great speed in the beginning of his London life. Before this he had completed his education in the collegiate school at Worcester, and at Worcester College, Oxford, distinguishing himself in both places by practical jokes, mimicry, and audacious pleasantries of all kinds, but also acquiring a classical training which afterwards enabled him neatly to turn a classical quotation or allusion, and helped to give to his prose style, when he chose to write seriously, a sufficient degree of fluency and elegance.

Foote was, it is stated, "designed" for the law, but certainly not by nature. In his chambers at the Temple, and in the Grecian Coffee-house hard by, he learned to know something of lawyers if not of law, and picked up a smattering of law-terms, and a knowledge of the forms and features of ordinary law-suits. Thus he was afterwards able to jest at the jargon and to mimic the mannerisms of the bar, and to satirize the Latitats of the other branch of the profession with particular success. The famous argument in Hobson *v.* Nobson (in *The Lame Lovers*) is as good of its kind as that in Bardell *v.* Pickwick itself; and doubtless Foote had duly studied some of the most ludicrous or contemptible types among the 1175 barristers ("if we reckon one barrister to twenty attorneys") and 23,518 attorneys (if we "only quarter one attorney upon fifty houses"), of whom, according to the lecturer in *The Orators*, the profession was in his day composed. But a stronger attraction drew him to the Bedford Coffee-house in Covent Garden, and to the theatrical world of which it was the social centre. After he had got rid of a second fortune (which he appears to have inherited at his father's death), and had in the interval passed through severe straits of want, he gave up playing the part of a fine gentleman, and in 1744 made his first appearance on the actual stage. Whether before this time Foote had married remains a very doubtful question. It is said that about the time of the family catastrophe he had married a young lady in Worcestershire—actually, and not in imagination only, like young Wilding in *The Liar;* but the traces of his wife (he affirmed himself that he was married to his "washerwoman") are mysterious, and probably apocryphal; in after days no lady presided at his table, or controlled the libations of claret which flowed with equal abundance in his servants' hall, and his two sons were illegitimate.

Foote's first appearance as an actor was made little more than two years after that of Garrick, as to whose merits the critics, including Foote himself, were now fiercely at war. His own first venture, as Othello, was a failure; and though he was fairly successful in genteel comedy parts, and was, after a favorable reception at Dublin, enrolled as one of the regular company at Drury Lane in the winter of 1745–46, he had not as yet made any palpable hit. Finding that his talent lay neither in tragedy nor in genteel comedy, he had begun to wonder (as he tersely expressed it) "where the devil it *did* lie," when his successful performance of the part of Bayes in *The Rehearsal* at last suggested to him the true outlet for his peculiar talent. Following the example of Garrick, he had introduced into this famous part imitations of actors, and had added a variety of other satirical comment in the way of what in stage parlance is called "gag." He lost no time in availing himself of the discovery that in his powers of mimicry lay his surest means of securing a hold over the public. After engaging a small company of actors, he boldly announced for April 22, 1747, at the theatre in the Haymarket ("*gratis*"), "a new entertainment called the *Diversions of the Morning*," to which were to be added a farce adapted from Congreve, and an epilogue "spoken by the B—d—d Coffee-house." Though, of course, nine-tenths of the fun in all such entertainments would evaporate even in a shorthand report, and though of these *Diversions* it is only possible to form a notion from scattered recollections and from such parts as were afterwards incorporated in one of Foote's comedies (*Taste*, act i.), or adapted for later reproduction at Drury Lane (act ii., printed in Cooke' *Memoirs*), yet there is no difficulty in understanding the secret of Foote's immediate success, which is said at once to have obtained for him the name of "the English Aristophanes." The absurdity of this compliment has often been remarked upon; but it may be worth observing that Foote was probably himself the first (in his letter on *The Minor*) to decline the comparison, while "leaving the task of pointing out the mistake to his enemies." The *Diversions* consisted of a series of imitations of actors and other well-known persons, whose various peculiarities of voice, gesture, manner or dress were brought directly before the spectators; while the epilogue introduced the wits of the Bedford engaged in ludicrous disputation, and specially "took off" an eminent physician and a notorious quack oculist of the day. The actors ridiculed in this entertainment having at once procured the aid of the constables for preventing its repetition, Foote immediately advertised an invitation to his friends to drink a dish of tea with him at the Haymarket on the following day at noon—"and 'tis hoped there will be a great deal of comedy and some joyous spirits; he will endeavor to make the morning as diverting as possible. Tickets for this entertainment to be had at St. George's Coffee-house, Temple-Bar, without which no person will be admitted. N. B.—*Sir Dilbury Diddle will be there, and Lady Betty Frisk has absolutely promised.*" The device succeeded to perfection; further resistance was abandoned as futile by the actors, whom Foote mercilessly ridiculed in the "instructions to his pupils" which the entertainer pretended to impart (typifying them under characters embodying their several chief peculiarities or defects—the massive and sonorous Quin as a watchman, the shrill-voiced Ryan as a razor-grinder, the charming Woffington, whose tones had an occasional squeak in them, as an orange-woman crying her wares and the bill of the play); and Mr. Foote's *Chocolate*, which was afterwards converted into an evening *Tea*, became an established favorite with the town.

The way to fame and its fruits having now at last been found, the remainder of Foote's professional career was on the whole prosperous enough. He seems, indeed, after this to have contrived to spend a third fortune, and to have found it necessary to eke out his means by a speculation in small-beer, as is recorded in an amusing anecdote told of him by Johnson. But whatever abstract arguments he might find in favor of the life of a man in debt and against the practice of "muddling away money in tradesmen's bills," he could now command a considerable income; and when money came he seems (like a true actor) to have freely divided it between the pleasures of hospitality and the claims of charity. During his engagements at Covent Garden and at Drury Lane (of which he was, in passing, joint-manager), and in professional trips to Scotland, and more especially to Ireland, he appeared both in comedies of other authors and more especially in his own. Among the latter, of which something will be said below, *Taste* (1752) is the first of a series numbering (exclusively of the *Diversions* and one or two similar pieces) eighteen. The majority of them were produced at the Haymarket, which continued the favorite home of Foote's entertainments, and for which in 1760 he succeeded in obtaining a license from the lord chamberlain, afterwards (in 1766) converted into a license for summer performances for life. The entertainments in question may be briefly described as a succession of variations on the original idea of the *Diversions* and the *Tea*. Now, it was an *Auction of Pictures* (1748), of part of which an idea may be formed from the second act of the comedy *Taste;* now, a lecture on *Orators* (1754), suggested by some bombastic discourses given by Macklin in his old age at the Piazza Coffee-house in Covent Garden, where Foote had amused the audience and confounded the speaker by interposing his humorous comments. *The Orators* is preserved in the shape of a hybrid piece, which begins with a mock lecture on the art of oratory and its representatives in England, and ends with a very diverting scene of a pot-house forum debate, to which Holberg's *Politician-Tinman* can hardly have been a stranger. At a later date (1773) a new device was introduced in a *Puppet-*

show; and it is a pity that the piece played in this by the puppets should not have been committed to print. It was called *Piety in Pattens*, and professed to show "by the moral how maidens of low degree might become rich from the mere effects of morality and virtue, and by the literature how thoughts the most commonplace might be concealed under cover of words the most high flown." In other words, it was an attack upon sentimental comedy, to which more than one blow had been already dealt, but which was still not altogether extinguished. Indeed, though no one now reads *Pamela*, it may be doubted whether she and her cousinhood will ever be altogether suppressed on the modern stage. The *Puppet-show* was also to have contained a witty attack upon Garrick in connection with the notorious Shakespeare jubilee; but this was withdrawn, and thus was avoided a recurrence of the quarrel which many years before had led to an interchange of epistolary thrusts, when the manager of Drury Lane had permitted Woodward to attempt an imitation of Foote. On the whole, the relations between the two public favorites were very friendly, and on Foote's part (notwithstanding a number of witticisms directed especially against Garrick's interest in Queen Anne's farthings and the like) unmistakably affectionate; and they have been by no means fairly, or at least generously, represented by Garrick's most recent biographer. A comparison between the two as actors is of course out of the question; but, though Foote was a buffoon, and his tongue a scurrilous tongue, there is nothing in the well-authenticated records of his life to suggest that his character was one of malicious heartlessness. On the other hand, it was not altogether the fault of his position that he was unable to conciliate the respect of society, though, unlike Garrick, he could hardly have expected to form one of the chosen circle into which (though not without protest) the former gained admittance. It is at the same time characteristic of the difference between the London of that day and the London of our own, where club secrets are among the favorite morsels of public gossip, that the famous Club had been ten years in existence before Foote knew of it. Of Johnson's opinions of him many well-known records remain in Boswell; and if it is remembered that when Johnson had at last found his way into Foote's company (he afterwards found it to Foote's own table) he was unable to "resist" him, it should likewise not be forgotten that on hearing of Foote's death he recognized his career as worthy of a lasting biographical record.

Meanwhile most of poor Foote's friendships in high life were probably those that are sworn across the table, and require "t'other bottle" to keep them up. It is not a pleasant picture—of Lord Mexborough and his royal guest the duke of York, and their companions, bantering Foote on his ignorance of horsemanship, and after he had weakly protested his skill, taking him out to hounds on a dangerous animal. He was thrown and broke his leg, which had to be amputated, the "patientee" (in which character he said he was now making his first appearance) consoling himself with the reflection that he would now be able to take off "old Faulkner" (a pompous Dublin alderman with a wooden leg, whom he had brought on the stage as Peter Paragraph in *The Orators*) "to the life." The duke of York made him the best reparation in his power by promising him a life-patent for the theatre in the Haymarket (1766); and Foote not only resumed his profession, as if, like Sir Luke Limp, he considered the leg he had lost "a redundancy, a mere nothing at all," but ingeniously turned his misfortune to account in two of his later pieces, *The Lame Lover* and *The Devil on Two Sticks*, while, with the true instinct of a public favorite, making constant reference to it in plays and prologues. He seemed to have lost none of his energy with his leg, though it may be observed that the characters played by him in several of his later plays are comparatively short and light. He continued to retain his hold over the public, and about the year 1774 was beginning to think of withdrawing, at least for a time, to the Continent, when he became involved in what proved a fatal personal quarrel. Neither in his entertainments nor in his comedies had he hitherto (except in Garrick's case, and it is said in Johnson's) put the slightest restraint upon the personal satire by which he terrified his victims and delighted their neighbors. One of his earlier experiments of this kind (*The Author*), in which, under the infinitely humorous character of Cadwallader, he had brought a Welsh gentleman of the name of Ap-Rice on the stage, had, indeed, ultimately led to the suppression of the play. But, to an extent of which it is impossible fully to judge, he had pursued his hazardous course, mercilessly exposing to public ridicule and contempt not only fribbles and pedants, quacks or supposed quacks in medicine (as in *The Devil on Two Sticks*), impostors or supposed impostors in religion, such as Dr. Dodd (in *The Cozeners*) and Whitfield and his connection (in *The Minor*). He had not only dared the wrath of the whole Society of Antiquaries (in *The Nabob*), and been rewarded by the withdrawal, from among the pundits who rationalized away Whittington's Cat, of Horace Walpole and other eminent members of the body, but had in the same play attacked a well-known representative of a very influential though detested element in English society,—the "Nabobs" themselves. But there was one species of cracked porcelain or blemished reputation which he was not to try to hold up to contempt with impunity. The rumor of his intention to bring upon the stage, in the character of Lady Kitty Crocodile in *The Trip to Calais*, the notorious duchess of Kingston, whose trial for bigamy was then (1775) impending, roused his intended victim to the utmost fury; and the means and influence she had at her disposal enabled her, not only to prevail upon the lord chamberlain to prohibit the performance of the piece (in which, it should be observed, there is no hint as to the charge of bigamy itself), but to hire agents to vilify Foote's character in every way that hatred and malice could suggest. After he had withdrawn the piece, and letters had been exchanged between the duchess and him equally characteristic of their respective writers, Foote took his revenge upon the chief of the duchess's instruments, a "Reverend Doctor" Jackson, who belonged to the "reptile" society of the journalists of the day, so admirably satirized by Foote in his comedy of *The Bankrupt*. This man he gibbeted in the character of Viper in *The Capuchin*, under which name the altered *Trip to Calais* was performed in 1776. But the resources of his enemies were not yet at an end; and a discharged servant of Foote's was suborned by Jackson to bring a charge and apply for a warrant against him. Though the attempt utterly broke down, and Foote's character was thus completely cleared, his health and spirits had given way in the struggle—as to which, though he seems to have had the firm support of the better part of the public, including such men as Burke and Reynolds, the very audiences of his own theatre had been, or had seemed to be, divided in opinion. He thus resolved to withdraw, at least for a time, from the effects of the storm, let his theatre to Colman, and after making his last appearance there in May, 1777, set forth in October on a journey to France. But at Dover he fell sick on the day after his arrival there, and after a few hours died (October 21st). His epitaph in St. Mary's Church at Dover (written by his faithful treasurer Jewel) records that he had a hand "open as day for melting charity." His resting-place in Westminster Abbey is without any memorial; nor indeed is it the actor's usual lot to receive from posterity any recognition which the contemporaries whom he has delighted have denied to him.

Foote's chief power as an actor must clearly have lain in his extraordinary gift of mimicry, which extended, as the best kind of mimicry always does, to the mental and moral, as well as the mere outward and physical peculiarities of the personages whose likeness he assumed. He must have possessed a wonderful flexibility of voice, though his tones are said to have been harsh when his voice was not disguised, and an incomparable readiness for rapidly assuming characters, both in his entertainments and in his comedies, where he occasionally "doubled" parts. The excellent "patter" of some of his plays, such as *The Liar* and *The Cozeners*, must have greatly depended for its effect upon rapidity of delivery. In person he seems to have been by nature ill-qualified for light comedy parts, being rather short and stout, and coarse featured; but the humor with which he overflowed is said to have found full expression in the irresistible sparkle of his eyes.

As a dramatic author, although he displays certain distinctive characteristics of indisputable brilliancy, he can only be assigned a subordinate rank. He was himself anxious to limit the definition of comedy to "an exact representation of the peculiar manners of that people among whom it happens to be performed; a faithful imitation of singular absurdities, particular follies, which are openly produced, as criminals are publicly punished, for the correction of individuals and as an example to the whole community." This he regarded as the *utile*, or useful purpose, of comedy; the *dulce* he conceived to be "the fable, the construction, machinery, conduct, plot, and incidents of the piece." For part at least of this view (advanced by him in the spirited and scholarly "Letter" in which he replied, "to the Reverend Author of the 'Remarks, Critical and Christian,' on *The Minor*") he rather loftily appealed to classical-authority. But he failed to point out the relation between the *utile* and the *dulce*, and to remember the indispensableness of the latter to the comic drama under its primary aspect as a species of art. His comic genius was particularly happy in discovering and reproducing characters deserving of ridicule; for "affectation," he says (in the introduction to *The Minor*, where he appears in person), "I take to be the true comic object;" but he failed in putting them to true artistic use. That he not only took his chief characters from real life, but closely modelled them on well-known living men and women, was not in himself an artistic sin, though it may have been a practice of doubtful social expediency, as it certainly involved considerable personal risk. Nor was the novelty of this absolute, but rather one of degree and quantity; other comic dramatists before and after him have done the same thing, though probably no other has ever gone so far in this course, or has pursued it so persistently. The public delighted in his "d——d fine originals," because it recognized them as copies; and he was himself proud that he had taken them from real persons, instead of their being "vamped from antiquated plays, pilfered from the French farces, or the baseless beings of the poet's brain." But the real excellence of Foote's comic characters lies in the fact that, besides being incomparably ludicrous types of manners, many of them remain admirable comic types of general human nature. Sir Gregory Gazette, and his imbecile appetite for news; Lady Pentweazel, and her preposterous vanity in her superannuated charms; Mr. Cadwallader, and his view of the advantages of public schools (where children may "make acquaintances that may hereafter be useful to them; for between you and I, as to what they learn there, does not signify twopence"); Major Sturgeon and Jerry Sneak; Sir Thomas Lofty, Sir Luke Limp, Mrs. Mechlin, and a score or two of other characters, are excellent comic figures in themselves, whatever their origin; and many of the vices and weaknesses exposed by Foote's vigorous satire will remain the perennial subjects of comic treatment so long as a stage exists. The real defect of his plays lies in the abnormal weakness of their construction, in the absolute contempt which the great majority of them show for the invention or conduct of a plot, and in the unwarrantable subordination of the interest of the action to the exhibition of particular characters. In a good play, whether it be tragedy or comedy, the characters are developed out of and by means of the action; but of this there is little trace in Foote. His characters are ready-made, and the action is only incidental to them. With the exception of *The Liar* (which Foote pretended to have taken from Lope de Vega, but which was really founded on Steele's adaptation of Corneille's *Le Menteur*), and perhaps of *The Bankrupt*, there is hardly one of Foote's "comedies" in which the conception and conduct of the action rise above the exigences of the merest farce. Not that sentimental scenes and even sentimental characters are wanting, that virtue is not occasionally in distress, or fails to vindicate itself triumphantly from the semblance of vice; but these familiar procedures are as incapable of exciting real interest as the ordinary course of a farcical action is in itself calculated to produce more than the most transitory amusement. In his earlier plays Foote constantly resorts to the most hackneyed device of farce—a disguise—which helps on the progress of a slender fable for which nobody cares to a close which everybody foresees. Of course Foote must have been well aware of the defect under which his rapidly manufactured productions labored; he knew that if he might sneer at "genteel comedy" as suited to the dramatists of the servants' hall, and pronounce the arts of the drama at the great houses to be "directed by the genius of insipidity," he, like the little theatre where he held sway, was looked upon as "an eccentric, a mere summer fly."

His merits as a comic dramatist are not, however, obscured by his incontestable defects. He was inexhaustible in the devising of comic scenes of genuine farce, in which the humor and wit of the dialogue are on a level with the general excellence of the conception. An oration of "old masters," an election of a suburban mayor, an examination at the College of Physicians, a newspaper conclave where paragraphs are concocted and reputations massacred—all these and other equally happy scenes are brought before the mere reader with unfailing vividness. And everywhere the comic dialogue is instinct with spirit and vigor, and the comic characters are true to themselves with a buoyancy which at once raises them above the level of mere theatrical conventionalism. Foote professed to despise the mere caricaturing of national peculiarities as such, and generally used dialect as a mere additional coloring; he was, however, too wide awake to the demands of his public not to treat France and Frenchmen as fair game, and perhaps there is nothing coarser in his plays than his constant appeal to national patriotic prejudice. His satire against those everlasting victims of English comedy and farce, the Englishman in Paris and the Englishman returned from Paris, was doubtless well warranted; and he was not slow to point out the fact—which Englishmen are wont to conceal when they come home from their travels—that they are nowhere more addicted to the society of their countrymen than abroad. In general, the purposes of Foote's social satire are excellent, and the abuses against which it is directed are those which it required courage to attack. The tone of his morality is healthy, and his language, though not aiming at refinement, is remarkably free from intentional grossness. Like all professed humorists, he made occasional mistakes; but he, too, was on the right side in the warfare against the pretentiousness of Cant and the effrontery of Vice, the two master evils of the age and the society in which he lived.

The following is a list of Foote's farces or "comedies," as he calls them, mostly in three, some in two acts, which remain in print. The date of production, and the character originally performed by Foote, are added to the title of each:—

The Knights (1748—Hartop, who assumes the character of Sir Penurious Trifle); *Taste* (1752); *The Englishman in Paris* (1753—Young Buck); *The Englishman Returned from Paris* (1756—Sir Charles Buck); *The Author* (1757—Cadwallader); *The Minor* (1760—Smirk and Mrs. Cole); *The Liar* (1760); *The Orators* (1762—Lecturer); *The Mayor of Garratt* (1763—Major Sturgeon); *The Patron* (1764—Sir Thomas Lofty and Sir Peter Peppercorn); *The Commissary* (1765—Mr. Zac. Fungus); *The Devil upon Two Sticks* (1768—Devil); *The Lame Lover* (1770—Sir Luke Limp); *The Maid of Bath* (1771—Mr. Flint); *The Nabob* (1772—Sir Matthew Mite); *The Bankrupt* (1773—Sir Robert Riscounter); *The Cozeners* (1774—Mr. Aircastle); *A Trip to Calais; The Capuchin* (1776—O'Donnovan).

Foote's biography may be read in W. ("Conversation") Cooke's *Memoirs of Samuel Foote* (3 vols., 1805), which contain a large collection of his good things and of anecdotes concerning him, besides two of his previously unpublished occasional pieces (with the act of the *Diversions* in a later form already mentioned), and an admixture of extraneous matter. From this source seems to have been mainly taken the biographical information in the rather grandiloquent essay on Foote prefixed to "Jon Bee's" useful edition of Foote's *Works* (3 vols., 1830). But few readers will care to go further than to the essay on Foote, reprinted with additions, from the *Quarterly Review*, in the late Mr. Forster's *Biographical Essays;* and none can fare better than those who turn to this delightful and discriminating study of a man of real though peculiar genius.

(A. W. W.)

FOPPA, Vincenzo, a painter, was born in Brescia soon after 1400, and died there in 1492. He settled in Milan towards 1425, and was the head of a school of painting which subsisted up to the advent of Leonardo da Vinci. His contemporary reputation was very considerable, his merit in perspective and foreshortening being recognized especially. Among his noted works are a fresco in the Brera Gallery, Milan, the Martyrdom of St. Sebastian; a Crucifix in the Carrara Gallery, Bergamo, executed in 1455; the Trinity, in the church of S. Pietro in Oliveto, Brescia; and other paintings in the same city.

FORAMINIFERA. This designation is part of that given by D'Orbigny in 1825 to an order of animals forming minute calcareous shells (found *recent* in shore-sand, and *fossil* in various Tertiary Limestones), for the most part many-chambered, and often bearing a strong resemblance in form (fig. 1) to those of *Nautilus Orthoceras*, and other chambered Cephalopods,—his (supposed) *Cephalopoda foraminifera* being distinguished from the (real) *Cephalopoda sipunculifera* (Nautilus and its allies) by the want of the "siphon" which passes from chamber to chamber in the latter, and its replacement in the former by mere "foramina" in the dividing septa. And it seems to have been the applicability of this term *Foraminifera* to the *shells* thus characterized which has caused it to be retained as their ordinary designation, notwithstanding that the knowledge since acquired of the *animals* that form these shells necessitates the removal of the group from the elevated position assigned to it by D'Orbigny, to nearly the lowest grade of the whole animal series. It was by the admirable observations upon living *Foraminifera* published by Dujardin, in 1835, that attention was first drawn to the existence of a type of animals more simple than any previously known,—their bodies consisting entirely of an apparently homogeneous semi-fluid substance, to which he gave the name "sarcode;" and this substance projecting itself through apertures of the shell into indeterminate ramifying extensions (which he termed *pseudopodia*), capable of being retracted and fused again (so to speak) into the general mass of the body. Regarding these animals as a section of the large group of *Infusoria*, whose bodies he supposed to have a like simplicity of sarcodic composition, he distinguished them as *Rhizopods*, on account of the root-like character of their pseudopodial extensions.

The general correctness of Dujardin's description of the animals that form Foraminiferal shells has been fully confirmed by subsequent researches; but the larger knowledge since obtained of the nature of the *Protozoa* has led to a more correct apprehension of the relations of the Rhizopoda to the other components of that group. What is now regarded as the simplest type of an animal, designated a *Moner* (see Animal Kingdom, vol. ii. p. 45), consists of an independent particle of the elementary form of living matter known as "protoplasm" (the "sarcode" of Dujardin), which is capable of growth and maintenance by the assimilation of nutrient material, and of multiplying itself either by subdivision or by some modification of that process. Now the first stage of differentiation of this apparently homogeneous substance into histogenetic elements consists in the appearance of certain rounded bodies termed *endoplasts*, which appear to be the equivalents of the *nuclei* of the "cells" whose individuation marks a higher stage of differentiation. And the next stage (well seen in *Amœba*) consists in the differentiation of a more consistent external layer, or "ectosarc," from the less consistent substance of the interior, or "endosarc," in which are observable "vacuoles" containing fluid, of which one or more (that seem bounded by a definite pellicle, and are known as "contractile vesicles") contract and dilate rhythmically. As yet, however, there is no definite point of entrance for alimentary particles, or of exit for excrementitious matter,—nutrient *ingesta* being admitted, and their unassimilable residue being got rid of, through any spot of the ectosarc. It is in the presence of a definite mouth, and usually of an anus also, that even the simplest of the true ciliated *Infusoria* show a decided advance upon the "rhizopodal" type,—an advance which is still more marked in the higher *Infusoria* by the complexity of their internal organization.

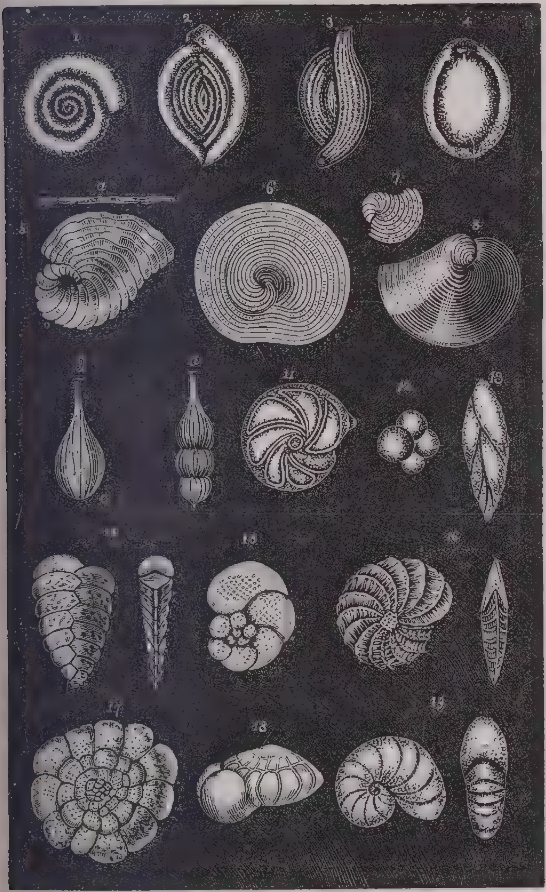

Fig. 1.—Various forms of *Foraminifera*:—1, Cornuspira; 2, Spiroloculina; 3. Triloculina; 4, Biloculina; 5, Peneroplis; 6, Orbiculina (cyclical); 7, Orbiculina (young); 8, Orbiculina (spiral); 9, Lagena; 10, Nodosaria; 11, Cristellaria; 12, Globigerina; 13, Polymorphina; 14, Textularia; 15, Discorbina; 16, Polystomella; 17, Planorbulina; 18, Rotalia; 19, Nonionina.

Now the animal bodies of *Foraminifera*, notwithstanding the regularity and complexity of the shells they form, show but a very slight advance on the simplest moneral type. For their protoplasmic substance does not seem to be differentiated into "ectosarc" and "endosarc,"—every part of it alike projecting itself into pseudopodial extensions, and these extensions being capable, not only of dividing and ramifying indefinitely, but also of reuniting by mutual fusion when they come into contact with each other, so as to constitute an irregular network (figs. 2, 3, 4). It is on account of this last peculiarity that the writer has distinguished the *reticulose* forms of the Rhizopod type from the *lobose* (consisting of *Amœba* and its allies) on the one hand, and from the *radiolarian* (of which *Actinophrys* is the type) on the other. The sarcodic bodies of *Foraminifera* were believed until recently to have neither "nuclei" nor "contractile vesicles;" but as the observations of Hertwig and F. E. Schulze have established the presence of these in some instances (the writer also having observed "endoplasts" in *Orbitolites*), it is probable that they exist universally.

The attention which has been given in recent years to the study of *Foraminifera* has invested the group—formerly considered as comparatively insignificant—with a new interest and importance. For (1) these minute testaceous Rhizopods, instead of having mere local *habitats*, are diffused abundantly through all save polar seas, and seem to do the first work of collecting by imbibition, and of converting into living substance, the organic matter which is contained, however sparingly, in all oceanic water, and the restoration of which, as fast as it is thus withdrawn, is effected by the various forms of marine vegetation.[1] Again (2), without anything that can be called organization, the protoplasmic bodies of these animals give origin to protective casings of marvellous regularity of form, and often of great complexity of structure,—these being sometimes "tests" built up by the apposition of sand-grains or other particles collected from the bottom on which they live, the animals only furnishing the cement by which they are held together, but being more often true "shells," formed (like the skeletons of higher animals) by an interstitial deposit of carbonate of lime drawn from the surrounding medium, in the substance of living tissue. Notwithstanding (3) the absence of any perceptible differences in the character of the animals they respectively contain, these protective casings, whether sandy "tests" or calcareous "shells," present a wide diversity of fundamental form, which is almost indefinitely augmented by subordinate modifications; and these modifications are generally so gradational as to render it impossible (when a sufficient number of specimens are compared) to draw any lines of separation between what appear, when only the extremes are regarded, to be clearly differentiated types. And this is true, not merely of *species* (which in the sense of constantly differentiated races cannot be said to have any existence among *Foraminif-*

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[1] That all *marine* animal life must ultimately depend upon *marine* vegetation is as certain as that all the animal life of the *land* ultimately depends upon *terrestrial* vegetation. And looking to the very large proportion which, not only among Fishes, but also in the higher Mollusca, Crustacea, and Echinodermata, the carnivorous bear to the phytophagous types, and to the abundance of the former on bottoms far too deep for the growth of the Algæ required for the sustenance of the latter, and on which there is no "raining down" of Diatoms from the surface (as in polar areas), it seems obvious either that there must be animals capable of generating organic compounds for themselves out of the gases contained in ocean-water, or that it must itself supply nutrient material in the liquid form to animals specially adapted to imbibe and assimilate it. Of the possibility of the former hypothesis we have no evidence whatever; and in the absence of light at great depths, any new production of organic compounds seems almost inconceivable. On the other hand, the analyses made by Dr. Frankland of the specimens of ocean-water brought home in the "Porcupine" expedition of 1869 have shown that it always contains an appreciable proportion of nitrogenous matter; while in *Foraminifera* there seems to be a special capability of imbibing and assimilating such matter by the extension of the soft body into a protoplasmic network, exposing a very large surface. Of the importance of this provision (first suggested by Sir Wyville Thomson) in the economy of nature the following is an apt illustration:—Large quantities of cod are taken by fishermen on the Faroe banks, attracted

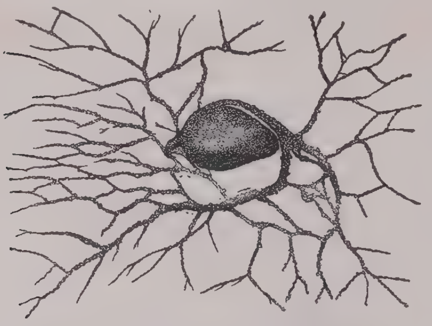

FIG. 2.—*Lieberkühnia*, with reticular pseudopodia.

era), but also of what would elsewhere be accounted *genera;* whilst even *families* cannot, as a rule, be sharply defined, many of them containing aberrant forms that defy all attempts at strict limitation. In fact, it would be scarcely a figure of speech to say that, within each of the three primary subdivisions of the group to be presently marked out, every form passes gradationally into every other. Hence the study of *Foraminifera*—whose small (but not *too* small) size and numerical abundance are peculiarly favorable to the comparison of large series of individuals—affords a most valuable lesson in taxonomy,—giving the best illustration that the whole animal kingdom can afford of the production of almost endless varieties of conformation by "descent with modification." Looking (4) to the almost universal diffusion of existing *Foraminifera*, and to the continuous accumulation of their calcareous *exuviæ* over vast areas of the ocean-bottom, there can be little doubt that they are at present doing more than any other tribe of marine animals to separate carbonate of lime from its solution in sea-water, so as to restore to the solid crust of the earth what is being continually withdrawn from it by the solvent action exerted by rain and rivers upon the calcareous material of the upraised land. And when (5) we look back into the past history of our globe, we not only find conclusive proof of the enormous contributions which *Foraminifera* have made to the calcareous strata of Tertiary and Secondary epochs (Nummulitic Limestone and Chalk having been almost entirely formed by their agency), but encounter strong reason for the belief that the principal mass of the Palæozoic Carboniferous Limestone had a similar origin. And when finally (6) we go still further back in geological time, and bring our knowledge of this type to bear on the very earliest calcareous formation that has yet been found in stratified rocks (the Serpentine Limestone of the Canadian Laurentians), we find distinct evidence that this also had its origin in Foraminiferal growth; which has thus stamped the impress of its existence even upon the oldest of those Archaic rocks, which, through a long subsequent succession, have as yet yielded no other distinct evidence of the existence of either animal or vegetable life on our planet, And thus in all parts of the geological series we not only recognize the constructive work of these humble organisms, but, interpreting the past by the present, find ever-increasing reason to believe that it has exceeded that of all other marine animals taken collectively.

A concise statement of the evidence in support of each of these positions will be embodied in the following sketch of the life-history, present and past, of this group; which will be so drawn as rather to bring into view its great features of general interest, than those details with which the systematist only is concerned.

Although the testaceous *Foraminifera* are all marine, certain shell-less animals essentially similar in nature occur in fresh water; and these, of which *Lieberkühnia* (fig. 2) is a characteristic example, afford the best means of studying the life-history of the "reticulose" type. In its inactive state *Lieberkühnia* is an ovate corpuscle of granular protoplasm about 1-400th of an inch in diameter, not presenting either any distinct differentiation of "endosarc" and "ectosarc" or "contractile vesicle," or any evident "nucleus," but including a large number of vacuoles filled with a homogeneous liquid. In its active state, on the other hand, the body puts forth a sort of stem, which soon branches irregularly into pseudopodia; and these subdivide and ramify with great minuteness to an extent two or three times as great as that represented in the figure, the ramifications coalescing whenever they come into contact with each other, so as to form an irregular network which may be compared to an animated spider's-web. This network serves to entangle either minute particles (such as chlorophyll granules) or larger bodies (such as Infusoria) that come in its way,—the former being transmitted to the central body by a sort of circulation (closely resembling the *cyclosis* of vegetable cells) which is constantly going on through the whole protoplasmic network, and the latter becoming enclosed in a kind of sheath formed by the blending of the neighboring pseudopodia, which apply themselves to its surface and draw it into the central mass by their gradual contraction. Although destitute of any protective envelope, *Lieberkühnia* does not put forth its pseudopodia indifferently from any part of its surface,—their primary stem being enveloped in a transparent sheath, which may be traced as a thin pellicle over the whole body.

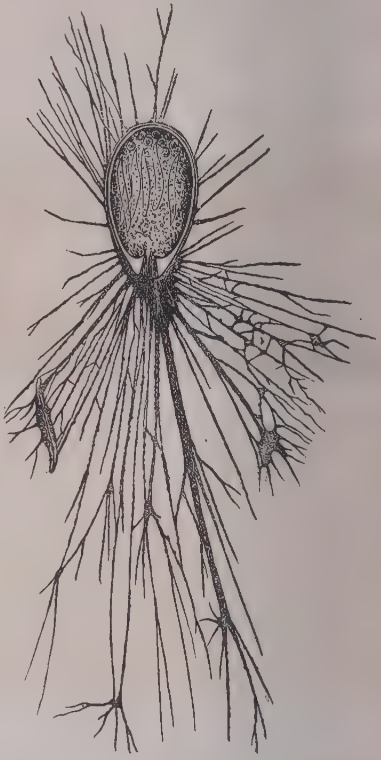

FIG. 3.—*Gromia*, with extended pseudopodia.

And in *Gromia* (fig. 3), of which some forms inhabit fresh water (attaining a size that renders them visible to the naked eye), whilst others are marine, this pellicle is thickened into a distinct casing or "test" of ovoidal shape (probably composed of chitin[1]), with a single round orifice of

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thither by the abundance of star-fish, on which they greedily feed; and the stomachs of these star-fish are found to be filled with *Globigerinæ*. Thus man is dependent for this "harvest of the sea"—in the first place upon the star-fish that feed the cod; secondly, on the foraminifers that feed the star-fish; thirdly, on the organic material (in very weak solution) which ocean-water supplies to the foraminifers; and finally, on the various forms of marine vegetation by which this supply is continually being renewed. The writer deems it probable that the same function is performed by *Sponges*, whose ramifying internal canal-system provides a vast extent of absorbent surface, and that this is the explanation of the otherwise singular fact, that the "cold-area" (temp. 30° Fahr.), not far from the Faroe banks, swarms with various types of boreal Echinoderms, notwithstanding the almost entire absence of *Foraminifera* caused by the depression of temperature, their place being taken by a particular type of *Sponge* which there finds a congenial *habitat*, and probably supplies food to higher marine animals.

[1] There seems reason for regarding this as representing the "cellu

moderate size, through which the sarcodic body puts forth its pseudopodial extensions. When the animal is in a state of repose, these are entirely retracted into the test; but when its activity recommences, they are put forth from its orifice, as from the stem of *Lieberkühnia*, and form a sarcodic network which is in a state of incessant change—new centres of radiation often arising where two or more pseudopodia coalesce, by the flowing of the protoplasm towards those points. It is specially noticeable in this type that the sarcodic body extends itself over the entire surface of the test, so as completely to enclose it, and that pseudopodia are put forth from every part of this extension, being especially numerous at the posterior end, where they probably serve to fix the test, and thus to enable the animal to put forth more power in seizing the larger creatures that serve as its food. For whilst it is partly nourished by the minute granules that adhere to its outspread network, it lays hold of the smaller Infusoria and Diatoms, the zoospores of Confervæ, etc., and draws them entire into the interior of the test, within which their indigestible remains may frequently be seen. Now, if the transparent pellicle of *Lieberkühnia* were consolidated by calcareous instead of by chitinous deposit, a monothalamous (single-chambered) "shell" would be produced (9 in fig. 1), such as constitutes the permanent form of the simplest *Foraminifera*, and the primordial form of even the most complex. This shell, like the test of *Gromia*, may have but a single aperture, from which the pseudopodial extensions are put forth, and through which alone nutriment is received into the contained body. But in a large portion of the polythalamous (many-chambered) *Foraminifera* (fig. 4), the shell-wall is perforated with minute pores over its entire surface, through which pseudopodia extend themselves in a radial direction; and while the coalescence of these at their origin forms a continuous sarcodic layer that covers the exterior of the shell, the coalescence of their extremities forms new centres of radiation at a distance from it. The aperture or mouth in these types is much smaller than in the preceding, and appears to serve rather for the projection of the stolon-process, by which new chambers are formed (in the manner to be presently described), than for the introduction of nutriment. And when it is considered that the diameter of the pores of the shell never exceeds 1-5000th of an inch (being often much less than 1-10,000th), and that the chlorophyll-granules, zoospores, etc., that nourish the fresh-water Rhizopods are altogether wanting in the sea-depths inhabited by the higher types of *Foraminifera*, there seems additional ground for the doctrine already propounded, that the nutrition of the animals of this group is mainly drawn rather from the organic matter that is dissolved in the medium they inhabit, than from solid particles suspended in it.

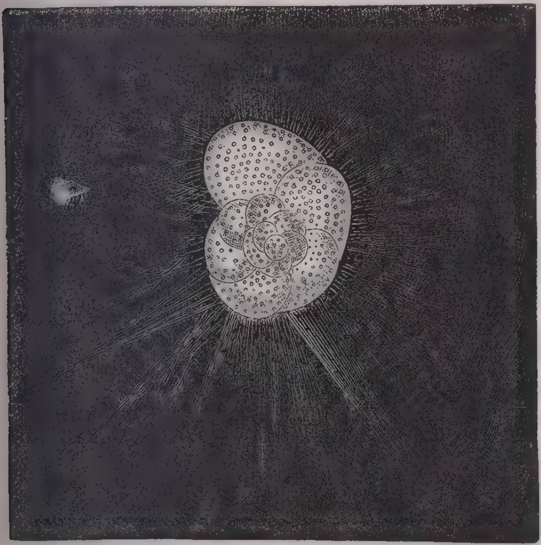

FIG. 4.—*Rotalia*, with pseudopodia extended through the pores of the shell.

In regard to the propagation of *Foraminifera*, little is as yet certainly known. The growth of the individual may proceed, as will be presently shown, to an almost indefinite extent, by the gemmiparous multiplication of the segments or divisions of its body, with a corresponding multiplication of the chambers of its shell; but it more frequently happens that when the organism has attained a certain limited size, the new segments detach themselves, each one growing into the likeness of its parent; and this is probably the ordinary way in which the continuance of the race is provided for. But it would also seem that under certain circumstances the sarcodic body of the parent breaks itself up into segments, each containing an "endoplast" or "nucleus," and that around each of these a shelly covering is formed while it is still enclosed within the original shell, the offspring finally escaping by its rupture. Whether this mode of propagation is preceded by any process of "conjugation," and is thus related to sexual generation, is still undetermined.

By far the greater number of *Foraminifera* are *composite* fabrics, evolved from a simple protoplasmic body by a process of continuous gemmation, each bud remaining in connection with the stock from which it was put forth; and according to the plan on which this gemmation takes place, will be the configuration of the composite fabric thereby produced. Thus if the bud be put forth from the aperture of the monothalamous *Lagena* (9 in fig. 1) in the direction of the axis of its body, if a second chamber be formed around this bud in continuity with the first (receiving the neck of the latter into its own cavity), and if this process be successionally repeated, it is obvious that a straight rod-like shell (10 in fig. 1) will be produced, having a series of chambers communicating with each other by the apertures that originally constituted their mouths, and opening externally by the mouth or aperture of the last formed chamber. The successive segments may be all of the same size, or nearly so; in which case the entire series may either resemble a string of beads, or may approach the cylindrical form, according to the shape of the chambers. But it more frequently happens that each segment somewhat exceeds its predecessor in size, so that the entire shell has a somewhat conical shape. If, on the other hand, the axis of growth should be slightly curved instead of straight, the resulting composite shell will be arcuate, while a more rapid deflection gives it a spiral curvature (5 and 11 in fig. 1). The form of the spire will depend in the first place upon whether its convolutions lie in the same plane, like those of a *nautilus*, so that the shell is equilateral (16 and 19 in fig. 1), or pass obliquely round a vertical axis, as in a *snail*, so that the shell becomes "inequilateral" (18 in fig. 1), having a more or less conical form, with the primordial chamber at its apex. In other cases, again, the vertical axis is greatly elongated, and the number of chambers forming each revolution around it is reduced to four, three, or even two (13 and 14 in fig. 1). But further, the spiral plan of growth may give place to the cyclical, successive circles of new chambers being formed around the interior growth, so as to give the shell a discoidal shape (6 and 17 in fig. 1). And sometimes all regularity of plan disappears in the later stages of growth, new chambers being added in various directions, so that the fabric becomes "acervuline."

In the older classifications of *Foraminifera*, these differences of plan of growth were adopted as characters of primary importance in the subdivision of the group. But it has now become obvious that comparatively little value is to be attached to them. For to associate together all rectilineal, all spiral, and all cyclical *Foraminifera*, is not only to run counter to the indications of natural affinity that are furnished by the intimate structure of the shell, the conformation of the individual chambers, and the mode of their intercommunication, but to set at naught two general facts of fundamental significance,—*first*, that one plan of growth often graduates insensibly into another, as does the straight into the spiral in the group of which 10 and 11 of fig. 1 are extreme forms; and, *second*, that it is not at all uncommon for the plan to change during the growth of one and the same individual,—the spire, for example, either straightening itself out, so as to revert to the rectilinear

lose wall" of the vegetable cell; which, in the curious *Chlamydomyxa* of Archer, opens at a certain stage of its life, and allows its protoplasmic contents to project themselves into a "reticulose" extension.

type, or returning into itself so as to make a complete circle, round which a succession of concentric annuli is then produced on the cyclical type, while the original regularity is sometimes lost altogether in the "acervuline" piling up of the later-formed chambers. On the other hand, the fundamental importance of the *perforation* or *imperforateness* of the external envelope, as affecting the physiological condition of the contained animal, is now universally admitted. For where (as in *Peneroplis*, 5 in fig. 1) that envelope, whether composed of calcareous shell or built up by the cementation of sand-grains, has no other communication with the exterior than by the single or multiple aperture of the last chamber through which the whole pseudopodial apparatus of the contained animal is put forth, the nutrition of the entire segmental body that occupies the previously formed chambers must be carried on by a continual interchange of protoplasmic substance extending through the entire mass, however great may be the multiplication of its segments. Where, on the other hand (as in *Rotalia*, fig. 4), the wall of each chamber is perforated for the passage of pseudopodia, the segment it contains is thereby placed in direct communication with the surrounding medium from which it derives its sustenance, so as to be independent of the remainder of the series. The "imperforate" calcareous shells of *Foraminifera* are also termed "porcellanous," from the opaque-white aspect they present when viewed by reflected light; though, when thin, they show a rich brown hue by transmitted light. Even under a high magnifying power, their substance appears entirely homogeneous. The perforated shells, on the other hand, having an almost glassy transparence (except where this is interrupted by tubulation), are known as "vitreous" or "hyaline." Where the shells are thin, the perforations are simply *pores* (fig. 4); but where they are thick, the perforations are *tubules* usually running straight and parallel from surface to surface (fig. 24).

Thus, then, the *Foraminifera* are naturally divisible in the first instance into two groups, the *Imperforata* and the *Perforata;* the former of which is again divisible into the *Arenacea*, which build up "tests" by the aggregation of sand-grains, and the *Porcellanea*, which form porcellanous shells; whilst the latter, *Vitrea*, includes all the perforate types. There is often a very curious parallelism between the forms contained in these three series respectively, still more between certain "porcellanous" and certain "vitreous" types; but this arises in each case from similarity in plan of growth, and does not indicate any real affinity. In fact the two calcareous-shelled series may be compared to two trees of different orders, which resemble each other in their mode of branching, but have dissimilar leaves and flowers.

I. Arenacea.—The calcareous shells of certain types of *Foraminifera*, alike in the "porcellanous" and in the "vitreous" series, are not unfrequently covered with sand-grains, cemented into the surface-layer of the true shell-substance. But in the group now to be described, the casing of the body is entirely composed of foreign particles (usually grains of sand, but sometimes minute *Foraminifera*, sponge-spicules, etc.), the animal furnishing nothing save the cement that holds them together; and in its lowest forms no special cement seems to be supplied, the sand-grains being simply imbedded in the sarcodic substance of the body. The increased attention which has of late been given to this group (our knowledge of which has been largely augmented by deep-sea dredging) seems to justify our regarding the "arenaceous" type as on the whole less advanced than either the "porcellanous" or the "vitreous,"—its lowest forms presenting a condition less specialized than even the simplest of the calcareous-shelled *Foraminifera*, whilst its highest, although sometimes attaining a comparatively gigantic size, build up their massive "tests" upon a very simple plan, exhibiting no approach to the complexity of structure to be found in the "shells" which some of them closely resemble in external form. A few of the more interesting types of the *Arenaceous* group will now be briefly noticed.

In the sandy mud which covers certain parts of the bottom of the 500-fathoms channel between the north of Scotland and the Faroes, the large monothalamous *Astrorhizæ* are so abundant as sometimes to form a great part of the contents of the dredge. Their typical shape (as the name implies) is discoidal with stellate radiations; but they are sometimes globular, sometimes cervicorn, and present every intermediate gradation between these forms. The "test" is composed of loosely aggregated sand-grains, not held together by any mineral cement; and it is *destitute of any definite orifice*, so that the sarcode-body (of a dark green color) which occupies the cavity must put forth its pseudopodial extensions between the sand-grains of its test. But there is, in the writer's belief, a lower form even than this. For in the same dredgings there were found a number of little globular masses varying in size from a pin's head to a large pea, formed of aggregations of sand grains, foraminiferal shells, etc., held together by a tenacious protoplasmic substance, without any definite structural arrangement. And although these might be supposed to be mere accidental agglomerations, yet there seems adequate reason for regarding them as living organisms of the simplest possible "monerozoic" type. For just as a simple "moner," by a differentiation of its homogeneous protoplasm, becomes an *Amœba*, so would one of these undifferentiated mixtures of sand and protoplasm, by the separation of its two components—the sand being limited to the superficial layer, so as to form an investing "test," of which the whole interior is occupied by the sarcode-body alone,—become an *Astrorhiza*.

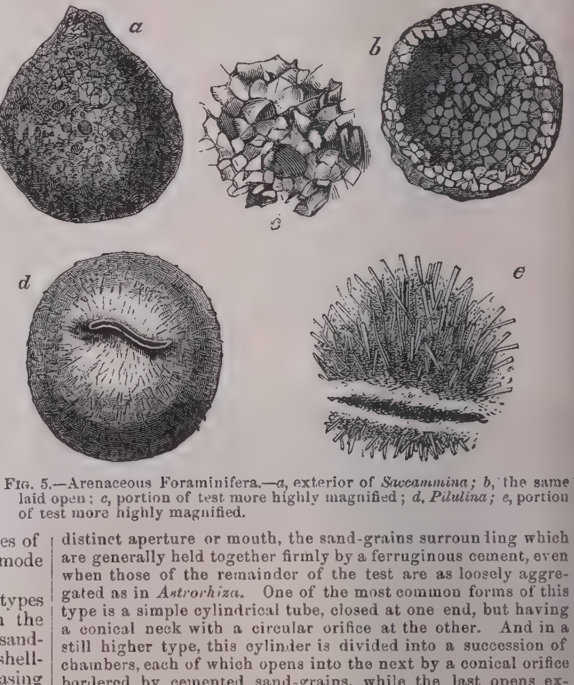

Fig. 5.—Arenaceous Foraminifera.—*a*, exterior of *Saccammina; b*, the same laid open; *c*, portion of test more highly magnified; *d*, *Pilulina; e*, portion of test more highly magnified.

The next degree of elevation is shown in the presence of a distinct aperture or mouth, the sand-grains surrounding which are generally held together firmly by a ferruginous cement, even when those of the remainder of the test are as loosely aggregated as in *Astrorhiza*. One of the most common forms of this type is a simple cylindrical tube, closed at one end, but having a conical neck with a circular orifice at the other. And in a still higher type, this cylinder is divided into a succession of chambers, each of which opens into the next by a conical orifice bordered by cemented sand-grains, while the last opens externally by a like orifice,—thus sketching out the "nodosarine" type of the "vitreous" Foraminifera, but on a much larger scale.

In the more advanced Arenaceous types, on the other hand, the sand-grains of the entire "test" are firmly united together by a cement composed of *phosphate of iron*, which must be exuded from the sarcodic body of the animal, its materials being originally derived from the sea water. In some instances the sand-grains selected are of such minute size that, when worked up with the cement, they form a sort of "plaster," the surface of which is quite smooth, both externally and internally. This is the case with the genus *Trochammina*, under which is ranged a whole series of forms ranging from a simple undivided tube to a perfect helical spire resembling a Catherine-wheel (whence the name given to the genus), and thence, by the alteration of its spire to the turbinoid, and by the subdivision of its cavity into chambers, to the "rotaline" type. In other instances the sand-grains are somewhat larger, but are apposed with such extraordinary regularity, and cemented together so artificially, as to form a most delicate but firm test of very uniform thickness, perfectly smooth both externally and internally. Tests of this kind present a singular series of adumbrations of the "orbuline," "globigerine," and "nodosarine" types of the vitreous series. In other cases, again, the sand-grains being larger, the "test" is constructed more coarsely, but still with remarkable symmetry. One of the most interesting of the simple coarse-grained forms is the little *Saccammina spherica*, whose flask-shaped tests (fig. 5, *a*, *b*) of the size of minute seeds, with prolonged necks and circular apertures, now found living abundantly in particular localities, have been also distinctly recognized in Carboniferous Limestone. That the size of the sand-grains used in the construction of such tests is not accidental (depending on the fineness of division of the sandy bottom on which the animals live), but is the result of selection on the part of the animals that use them, is shown not only by the fact that coarse-grained and fine-grained "tests" are brought up from the same bottom, but by the very curious difference in the materials used to form two kinds of tests nearly of the same size and of corresponding simplicity of type. The very same deep dredgings which yielded *Saccammina* brought up a number of other monothalamous spherical tests, filled with dark green sarcode, to which the name *Pilulina* has been given from their resemblance to homœopathic globules (fig. 5, *d*). These, instead of being constructed by the cementation of sand-grains, are composed of a sort of felt (*e*) made by the regular "laying" of siliceous fibres (the fine-pointed ends of elongated spongo spicules) with very minute sand grains dispersed among them; and the aperture, instead of being a round hole at the end of a short neck, is a sigmoid fissure with somewhat projecting lips. The constancy of these differences indicates a dissimilarity in the "potentialities" of the animals of the respective types, of which we find no indication in their apparently-homogeneous sarcodic bodies.

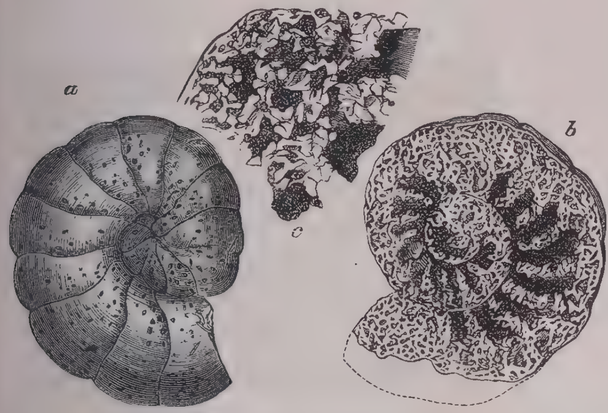

Fig. 6.—Nautiloid *Lituola*. *a*, exterior; *b*, chambered interior; *c*, portion of labyrinthic chamber-wall, showing component sand-grains.

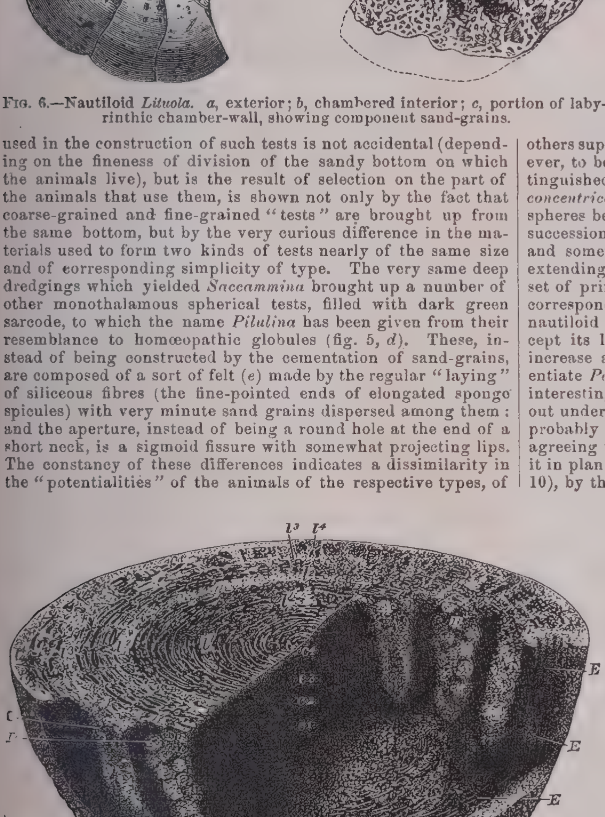

Fig. 7.—General view of the internal structure of *Parkeria*. In the horizontal section, l^1, l^2, l^3, l^4, mark the four thick layers; in the vertical sections, A marks the internal surface of a layer separated by concentric fracture; B, the appearance presented by a similar fracture passing through the radiating processes; C, the result of a tangential section passing through the cancellated substance of a lamella; D, the appearance presented by the external surface of a lamella separated by a concentric fracture which has passed through the radial processes; E, aspect of section taken in a radial direction so as to cross the solid lamella and their intervening spaces; c^1, c^2, c^3, c^4, successive chambers of nucleus.

The highest development of this type known to exist at the present time is shown in the large polythalamous "nautiloid" forms which have been brought up in considerable abundance from depths mostly ranging between 200 and 500 fathoms. The test (fig. 6, *a*) is for the most part composed of coarse sand-grains firmly cemented to each other; but it is generally smoothed over externally with a kind of "plaster" resembling that of which the "trochammine" tests are made up. On laying open the spire, it is found to be very regularly divided into chambers by partitions formed of cemented sand-grains (*b*), a communication between these chambers being maintained by a fissure left at the inner margin of the spire. So far, the plan of structure accords with that of the smaller "nonionine" forms (resembling 19 of fig. 1), which are found at much greater depths, ranging downward to more than three miles. But this more developed form is characterized by the extension of the principal cavity of each chamber into passages excavated in its thick external wall,—each passage being surrounded by a very regular arrangement of sand-grains, as seen at *c*. This "labyrinthic" structure is of great interest, from its relation on the one hand to the still higher development of the like structure in the large fossil *Lituola* of the chalk, whose crozier-like "test" has its principal chambers subdivided into "chamberlets," and on the other hand to that of two gigantic fossil *Arenacea*, one of the Cretaceous and the other of early Tertiary age.

Geologists who have worked over the Greensand of Cambridgeshire have long been familiar with solid spherical bodies, varying in size from that of a pistol-bullet to that of a small cricket-ball, which there present themselves not unfrequently, and have been regarded by some as mere mineral concretions, whilst others supposed them to be fossilized Sponges. They prove, however, to be "tests" of Arenaceous Foraminifera, which are distinguished from all other known foraminiferal types by their *concentrically-spherical* plan of growth (fig. 7),—the successive spheres being formed around a "nucleus," which consists of a succession of chambers arranged sometimes in a straight line and sometimes in a spiral, the last of them opening out and extending itself over its predecessors. Each sphere contains a set of principal chambers, with labyrinthic extensions of them, corresponding in all essential particulars with those of the nautiloid *Lituola* just described; so that there is nothing except its large size (which simply results from continuity of increase and spherically-concentric plan of growth) to differentiate *Parkeria* from ordinary *Foraminifera*. It is not a little interesting to find the very same plan of construction carried out under a different form in another gigantic fossil Arenacean, probably of the early Tertiary period, termed *Loftusia*; which, agreeing with *Parkeria* in all essential particulars, differs from it in plan of growth, *Loftusia* being formed, like *Alveolina* (fig. 10), by the rolling of a spiral round an elongated axis.

The discovery of these two singular types greatly enlarges our conceptions of the Arenaceous group, and shows how little justification there is for any attempt to lay down *a priori* restrictions as to the supposed "possibilities" of Foraminiferal organization.

II. Porcellanea.—In the sketch now to be given of the "porcellanous" series, it will be the writer's object to show the closeness of the relation between its simplest and its most complex and diversified forms (which he regards as all constituting but a single family, the *Miliolida*), and to indicate the chief of those gradational transitions by which a continuous affinity is established between them all.

Passing by the proteiform *Nubecularia*,—the tent-like incrusting shells of which rudely foreshadow almost every plan of growth to be met with among higher Foraminifera,—we commence with the simple *Cornuspira* (1 in fig. 1), whose spirally-coiled undivided tube, the exact isomorph of the helical arenaceous *Trochammina*, attaches itself to the Zoophytes and Sea-weeds of the British coasts. In full-grown specimens, the later turns of the spire generally flatten themselves out like those of *Peneroplis* (5 in fig. 1), so that the form of the mouth is changed from a circle to a long narrow slit. From this simple undivided spire we may pass along two divergent lines, one conducting us to the *milioline* and the other to the *orbiculine* type, and the latter again leading us to the *orbitoline*, in which the spiral plan of growth gives place in the very earliest stage to the cyclical. The shells of the *Miliolæ* (so named from their resemblance to millet-seeds) are at present found in the shore sands of almost every sea; and they accumulated in certain localities during the early Tertiary period to such an extent as to form massive beds of limestone. Their typical forms (3 and 4 in fig. 1) are composed of a succession of elongated chambers, usually arranged bi-serially on the opposite sides of a straight axis (3 in fig. 1), at one of the ends of which each chamber opens forwards into that which follows, whilst at the opposite end it opens backwards into that which preceded, the aperture in either case being partially closed by a "tongue" or "valve" (which may be considered an imperfect septum), as shown at 4, fig. 1. Indications of such a division may be sometimes noticed even in *Cornuspira,* but it shows itself fully in *Spiroloculina,* in which the spire has the form of an ellipse, at the two ends of whose major axis the new chambers commence alternately. The spiral plan of growth here remains obvious throughout; but in the typical Miliolines (3 and 4 in fig. 1) it is more or less obscured by the extension of the later chambers over the earlier, giving rise to the varied forms which have been distinguished under the generic names of *Biloculina, Triloculina,* and *Quinqueloculina,* according to the number of chambers visible externally. The extreme inconstancy, however, which is found to mark this distinction when large numbers of specimens are compared, entirely destroys its value as a differential character. Milioline shells, though frequently quite smooth, often show some kind of "sculpture," their surface being sometimes more or less deeply "pitted," sometimes regularly honeycombed, and sometimes longitudinally ribbed; and these diversities have been largely used for the characterization of species. Here again, however, the examination of a sufficiently large collection shows the futility of any such differentiation, since every gradation is found between the smooth and the most sculptured forms, while it is not at all uncommon for one and the same shell to be smooth on some parts of its surface, and deeply pitted, honeycombed, or ribbed on others—making it obvious that such differences have no more than a *varietal* significance. There is not, in fact, any group in the whole Animal Kingdom of which the study is more instructive than that of the *Miliolines,* in regard to the *extent of variation* which is compatible with conformity to a fundamental type.

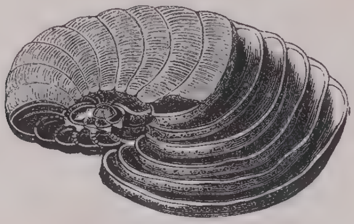

FIG. 8.—*Peneroplis.*

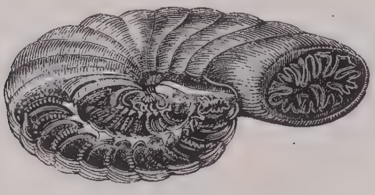

FIG. 9.—*Dendritina.*

The culminating form of the Milioline type may be considered to show itself in *Fabularia,* a fossil of the Paris Tertiaries not known to exist at present, in which the principal chambers are subdivided into "chamberlets," as in *Orbiculina* and *Orbitolites,* and the aperture is cribriform instead of single, the chamberlets opening externally by separate pores.

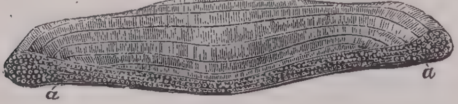

FIG. 10.—*Alveolina:*—*a, a,* septal plane, showing multiple ranges of pores.

The undivided helical tube of *Cornuspira,* again, graduates through *Hauerina* and the spiral forms of *Vertebralina* into the typical *Peneroplis* (fig. 8), a beautiful little shell that abounds in the shallow waters of many parts of the Mediterranean, and is remarkable alike for its glistening porcellanous surface, for the constancy of the ridge and furrow sculpturing which crosses the intervals between the septa, and for the flattening-out of its spire, and consequent narrowing and elongation of its septal plane (5*a* in fig. 1), which is perforated by a single linear series of pores. In tropical seas, however, this type shows itself under a very different aspect (fig. 9). The spire, instead of being flattened out, is turgid; and the septal plane, instead of being perforated by a linear series of pores, has a single large aperture, the dendritic shape of which has caused the name *Dendritina* to be assigned to this type. Now, although such marked differences between *Molluscan* shells would undoubtedly justify *generic* differentiation, yet among Foraminifera they prove to be not even of *specific* value; for when a sufficiently extensive series of this type is compared, its extreme forms graduate insensibly one into the other. In proportion apparently to the warmth of its *habitat* (the gradation being well seen in the Red Sea examples) the shell becomes less flattened and the septal plane broader, and the single row of pores becomes a double or even a triple series, the pores of different series being sometimes partially confluent. With a further increase in the turgidity of the spire, and with a progressive widening of the septal plane at the expense of its length, the pores lose their linear arrangement, and run together in groups, so as to form several irregularly fissured openings; and it is by the coalescence of these that the single dendritic aperture is formed in those examples whose general shape most nearly approaches that of *Nautilus.* This transition often shows itself in the successive stages of growth of one and the same shell. When we consider the physiological import of this variation, we find that it has no relation to any essential differences in the conformation of the animal,—all that it means being that the sarcodic *pseudopodia,* which issue separately in the one case, issue collectively in the other. It is interesting to remark, further, that in each of these types the spire often straightens itself out, so as to give to the shell the shape of a crozier (these "spiroline" forms being peculiarly common in the Red Sea), and that throughout the entire series the surface-marking is singularly constant.

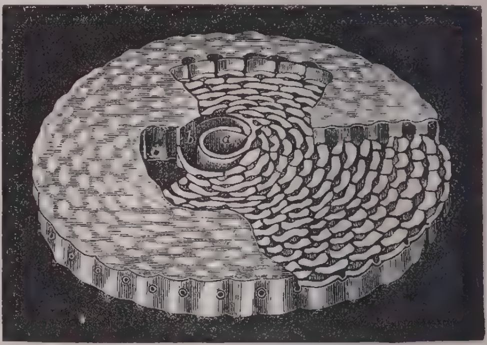

FIG. 11.—Shell of simple type of *Orbitolites,* showing primordial chamber, *a,* and circumambient chamber, *b,* surrounded by successive rings of chamberlets connected by circular galleries which open at the margin by pores.

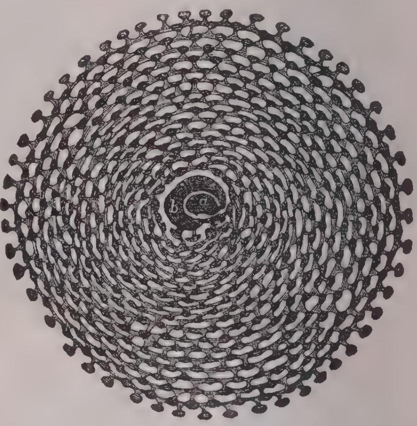

FIG. 12.—Animal of simple type of *Orbitolites,* showing primordial segment *a,* and circumambient segment *b,* surrounded by annuli of sub-segments connected by radial and circular stolon-processes.

From this simply-chambered type we pass on to that in which each chamber is more or less completely divided by transverse partitions (or secondary septa) into a series of "chamberlets," giving to the shell what is designated the "labyrinthic" structure. The first stage of this division, shown in figs. 11, 12, consists in a succession of contractions by which the sarcodic segment that occupies the cavity of each chamber acquires a moniliform or bead-like shape,—the sub-segments into which it is partially subdivided being connected by a continuous band or "stolon." And even where the separation of the chamberlets is most complete, there is still an aperture in each secondary septum, by which the lateral continuity of the sub-segments is maintained. The relation of the labyrinthic *Orbiculina* (6 and 8 in fig. 1), common in tropical seas, to the simple "peneropline" type, is well seen in the early stage (7 in fig. 1) of the former, which is obviously a *Peneroplis* with subdivided chambers. But as age advances, a remarkable change takes place. The later turns of the spire very commonly grow completely over the earlier, so as to make the umbilicus protuberant, as shown at 8 in fig. 1; and their thickness progressively increases by the vertical elongation of the sarcodic "blocks" that occupy their chamberlets into "columns," which communicate with the exterior and with each other through several ranges of marginal pores. In the very large and highly developed forms of this type (attaining a diameter of 7 or 8 lines), which make up the Tertiary Limestone of the Malabar coast, each surface of the spire has a thin layer of chamberlets divided off from the intermediate columnar portion, as in the "complex" type of *Orbitolites* to be presently described.

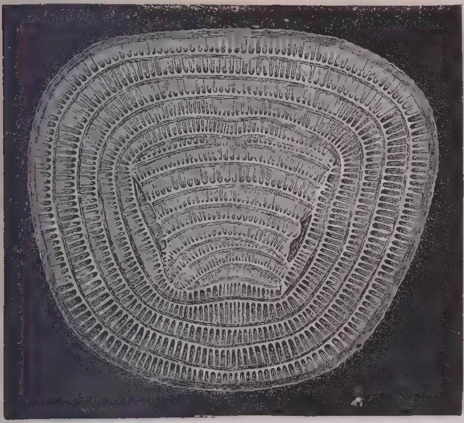
Fig. 13.—*Orbitolite* disk formed around a fragment of a previous disk, by the extension of the growing margin of the fragment along its broken edges.

Now if the axis round which this Orbiculine spire revolves were to undergo such an elongation (by a multiplication of its sub-segments in that direction) as to equal the diameter of the spire, the form would be changed to the globose, with a crescentic septal plane perforated by numerous separate pores; and a yet further increase in the comparative length of the axis would evolve the "fusiform" type characteristic of *Alveolina* (fig. 10), with an elongated and straightened septal plane showing several ranges of separate pores. The largest specimens of this type at present known seldom exceed 0·4 inch in length; and are greatly surpassed by those massive forms of the early Tertiaries whose accumulation in particular localities produced what is now known as the Alveolite Limestone.

Sometimes, on the other hand, even at an early age, the growing margin of *Orbiculina* extends itself laterally at both extremities, so that the two extensions meet on the opposite side of the original spire, which is thus completely enclosed by it. Its growth is thenceforth *cyclical* instead of spiral, concentric rings (each of them answering to one of the chambers of Peneroplis) being successively added, as shown at 6 in fig. 1, and the chamberlets into which they are subdivided opening by separate pores, usually arranged in several series, around the whole margin of the disk. Now, this is the plan of growth characteristic of *Orbitolites*, a type first known as fossil (abounding in the *Calcaire grossier* and other calcareous Eocene strata), but of which living forms have been since found abundantly in tropical and sub-tropical seas, frequently attaining a diameter of 8-10ths of an inch, and a thickness approaching 1-6th. While marginal portions of the disks of the cyclical *Orbiculina* could not be distinguished from those of certain forms of *Orbitolites*, there is such a difference in their origins and early histories as necessitates their generic separation. For in the typical Orbitolite the plan of growth is *cyclical* from the first, successive rings being formed around a "nucleus," which is never overlaid by later growths; and this nucleus consists of a "central" segment (*a*, figs. 11 and 12), which is more or less completely surrounded by a "circumambient segment" (*b*), that gives off numerous radiating stolon-processes to form the first ring of sub-segments. It is a fact of no small morphological interest, however, to find among the varietal forms of this type a distinct reversion to the *spiral* origin,—the most complete example of it being presented in the deep-sea *O. tenuissimus*, whose "nucleus" resembles a *Cornuspira* of three or four turns, of which the last turn rapidly opens itself out, showing a primary division into chambers and a secondary into chamberlets, thus distinctly connecting with the ordinary Milioline type the form whose plan of growth appears at first sight most fundamentally different. This plan is most readily apprehended by examining such small "simple" forms of this type (figs. 11, 12) as occur in the Ægean and Red Seas, in which the successive rings continue to be formed on the pattern of the first. Each chamberlet of the shell (fig. 11) is connected by a passage with those on either side of it; and it is from these intermediate passages, not from the chamberlets themselves, that the radiating passages proceed which lead to the chamberlets of the next ring, or which, in the case of the outermost ring, open at the margin between the protuberant walls of the chamberlets. So, in looking at the sarcodic body (fig. 12) of the animal which occupied the shell, we see that it consists of a succession of necklace-like rings, each consisting of an annular cord with bead-like enlargements at regular intervals, and giving off from the intervals between these beads the radiating stolon-processes which give origin to the sub-segments of the next annulus, as shown at the margin of the figure. These, extending themselves laterally at the growing edge of the shelly disk, will coalesce into a continuous cord, and a new ring of shell-structure will be formed by an excretion of calcareous matter from its surface. There is here no differentiation of parts whatever, every ring being a precise repetition (except as to number of parts) of that which preceded it; and in the living condition the semi-fluidity of the sarcode-body will allow of a perfectly free communication being kept up throughout the disk, so that nutrient matter taken in at the margin may be readily conveyed towards the centre The uniformity in the endowments of the segments is shown by

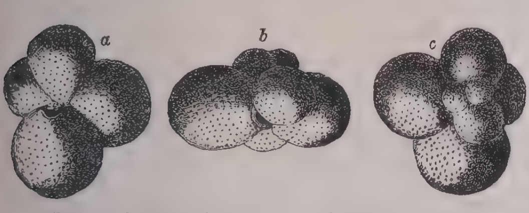

Fig. 14.—*Globigerina bulloides*, as seen in three positions.

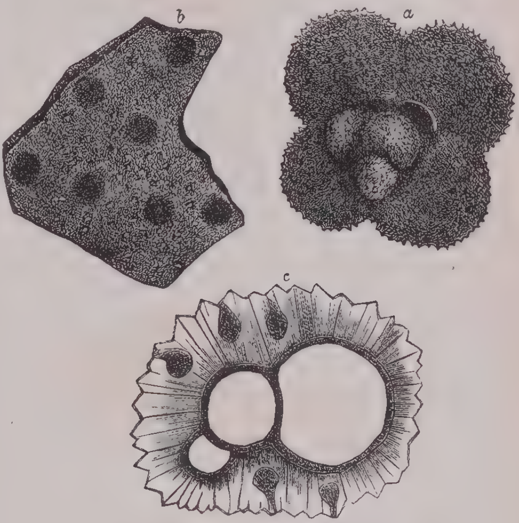

Fig. 15.—*Globigerina* from the Atlantic ooze, showing the thickening of the shell by exogenous deposit:—*a*, entire shell, showing the surface raised into areolated ridges; *b*, portion of shell more highly magnified, showing orifices of tubuli, and large cavities filled with sarcode; *c*, section of shell, showing exogenous deposit formed around the original chamber wall, which is raised into ridges with tubuli opening between them, and includes sarcodic cavities. (After Wallich.)

the fact, of which accident has repeatedly furnished proof, that a small portion of a disk entirely separated from the remainder, will not only continue to live, but will so increase as to form a new disk (fig. 13) whose concentric annuli form themselves regularly around the fragment, obviously by the extension of the annular sarcodic band from its proper growing margin around its whole periphery,—a fact of extreme significance, as showing that even in this elaborately constructed shell the animal body retains its original protoplasmic homogeneousness.

A yet greater complexity of structure presents itself in the large Orbitolite-disks of tropical seas, as also in those of whose fossil remains many Tertiary Limestones are chiefly composed. This complexity depends, in the first place, on the vertical elongation of the sub-segments into a columnar form, so as to produce a progressive thickening of the disk from the centre towards the margin, by which it comes to acquire a somewhat biconcave form: and with this there is an increase in the number of radiating stolon-processes, showing itself in a vertical multiplication of the ranges of marginal pores. The ends of the columns of each ring are connected laterally by two annular cords; and from each of these is given off a series of subsegments, that forms a layer of chamberlets on either surface of the disk, having no communication with those of the intermediate columnar structure except through the annular passages. Even this morphological differentiation does not seem connected with any diversity of function; and a careful comparison of a sufficiently extensive series of forms, from the most simple to the most complex, renders it clear that they are *gradationally connected*, the transition being a process of "evolution," on which heat (probably coupled with a more copious supply of food) exerts an important influence.

III. VITREA.—The vitreous-shelled *Foraminifera* constitute the most elevated division of the group, in regard alike to the high organization of their shell-substance, and to the elaborate construction shown in the shells of its most developed types. And it is in this division that we find the multiplication of individuals accomplishing by far the greater part of those two vast operations now in progress (as they seem to have been through all Geological time of which we know anything), which have been already specified as the great functions of the group:—the extraction from sea-water (1) of the minute quantity of organic matter universally diffused through it, which is converted into a *protoplasmic substance* fit to serve as food for higher animals, and (2) of the minute quantity of *carbonate of lime* held by it in solution, which is solidified into the substance of the shells whose accumulation gives rise to calcareous deposits on the ocean-bottom. The Vitreous *Foraminifera* may be grouped into three families, *Lagenida*, *Globigerinida*, and *Nummulinida*, the typical forms of which are distinguished by well-marked characters.

The chief feature of interest in the Family *Lagenida* is the unbroken succession of forms it presents, from the simple monothalamous *Lagena* to the complex polythalamous *Cristellaria*—all characterized by the very minute tubulation of the shell-substance, and by the circular form of the aperture of each chamber, which has usually an everted lip marked by radiating furrows. The *Lagena* (9 in fig. 1) is a minute flask-shaped shell, with a prolonged neck, having the mouth at its extremity; and its external surface usually presents some form of sculpture, such as prolonged ribs, separate tubercles, or honeycombed areolation. In *Nodosaria* (10 in fig. 1) we find a rectilinear succession of similar chambers, the neck of each received into the cavity of the next; while in *Cristellaria* (11 in fig. 1) a series of progressively enlarging chambers, still presenting the characteristic radiate aperture, is arranged in a nautiloid spiral. These composite types, which are connected by a series of intermediate degrees of curvature, show also the characteristic sculpturing of the simple *Lagena* with an endless variety of modifications; so that there is no group of *Foraminifera* which presents a more complete gradation between extremes so extremely diverse in form and surface-marking that, taken alone, they might fairly be adopted as types of distinct *genera*. Thus, as Mr. H. B. Brady[1] justly remarks, "if the word 'species' is anything more than a conventional term, the whole ought to constitute a single species. But governed by the exigences of a partially artificial arrangement, the modifications embraced in this single unbroken series constitute *thirteen genera*, or almost two entire families, in Professor Reuss's classification; while how many *hundreds*, if not *thousands*, of so-called 'species' have been founded upon the trivial characters above enumerated, it would need much patience to ascertain."

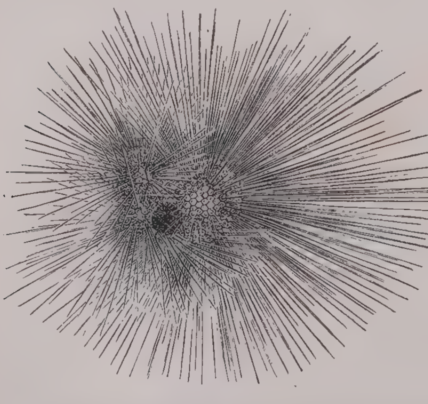

FIG. 16.—*Globigerina*, as captured by the tow-net floating near the surface.

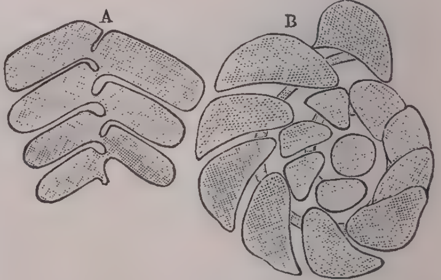

FIG. 17.—Internal casts of Foraminifera:—A, *Textularia*; B, *Rotalia*.

This variability shows itself also in the curious "polymorphism" sometimes exhibited during the growth of one and the same individual, which is especially characteristic of the genus *Polymorphina*. The young shell of this type is obviously made up of lageniform chambers regularly arranged in a double series alternating on the two sides of a rectilinear axis (13 in fig. 1); but from this plan there are often very wide departures in later stages of growth, both in the form and in the arrangement of the chambers—one of the most curious consisting in the backward prolongation of the last chamber over all that preceded it, and its extension into "stags-horn processes," which completely disguise the original conformation. In this aberrant type the characteristic "sculpturing" of the typical *Lagenida* is generally wanting—the shell in its young state being peculiarly thin and glassy: whilst in the large "wild-growing" forms the wall of the outer chamber is usually smooth, and has a porcellanous opacity.

The fundamental characters of the Family *Globigerinida*, which essentially consist in the coarse porosity of the shell (the pores being often $\frac{1}{5000}$th of an inch in diameter), and in the fissured, crescentic, or semioval form of the aperture of each chamber, are well seen in the typical genus *Globigerina*, the principal agent in that production of globigerina-ooze which is now repeating (rather, perhaps, continuing) the formation of the old Chalk. As obtained from the bottom by sounding or dredging, the *Globigerina* presents itself in the form shown in fig. 14—that is, as an aggregation of nearly spherical chambers, having coarsely porous walls like those of *Rotalia* (fig. 4), and cohering externally into a more or less regular turbinoid spire, each turn of which consists of four chambers, progressively increasing in size. These chambers, whose number seldom exceeds sixteen, do not communicate directly with each other, but each has its own separate mouth, opening into a common "vestibule" which occupies the centre of the under-side of the spire. The younger shells, consisting of from eight to twelve chambers, are thin and smooth; but the older shells are thicker, and are raised into ridges that form a hexagonal areolation round the pores (fig. 15, *a*); and this thickening is shown, by examination of thin sections of the shell (*b*) to be produced by an exogenous deposit (corresponding with the "intermediat skeleton" of the more complex types) that invests the origina shell-wall, sometimes containing little flask-shaped cavities filled with sarcode (Wallich). When taken alive by the tow-net, however, floating at or near the surface, the shells of *Globigerinæ* are found to be beset with multitudes of delicate calcareous spines, which extend themselves radially from the angles at which the ridges meet, to a length equal to four or five times the diameter of the shell (fig. 16).

"When the living *Globigerina* is examined under favorable circumstances, the sarcodic contents of the chambers may be seen to exude gradually through the pores of the shell, and spread out until it forms a kind of flocculent fringe round the shell, filling up the spaces among the roots of the spines, and rising a little way along their length. This external coating of sarcode is rendered very visible by the oil-globules, which are oval, and filled with intensely colored secondary globules, and are drawn along by the sarcode, and may be seen with a little care following its spreading or contracting movements. At the same time an infinitely delicate sheath of sarcode, containing minute transparent granules, but no oil-globules, rises on each of the spines to its extremity, and may be seen creeping up one side of the spine and down the other, with the peculiar *flowing* movement with which we are familiar in the pseudopodia of *Gromia*. If the cell in which the *Globigerina* is floating receive a sudden shock, or if a drop of some irritating fluid be added to the water, the whole mass of sarcode retreats into the shell with great rapidity, drawing the oil-globules along with it; and the outline of the surface of the shell and of the hair-like spines is left as sharp as before the exodus of the sarcode."[1]

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[1] *Monograph of Carboniferous and Permian Foraminifera*, p. 11.

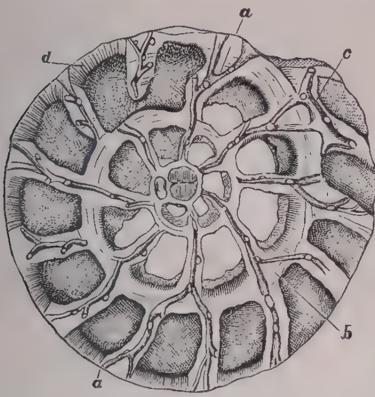

FIG. 18.—Section of *Rotalia Beccarii*, showing the canal system, *a*, *b*, *c*, in the substance of the intermediate skeleton; *d*, tubulated chamber-wall.

When a sample of the surface-layer of the "globigerina-ooze" is brought up from the sea-bottom by the sounding apparatus or the dredge, the shells are found for the most part perfect, except in the want of spines, but are of a more opaque whiteness than those captured near the surface, and hence have been supposed to be dead. This difference of aspect, however, may be attributed to the increase in the thickness of the shell by exogenous deposit, which is doubtless the cause of the like change in *Polymorphina;* and as a large proportion of these bottom-shells have their chambers filled with sarcode exactly resembling that of the types which unquestionably live at the bottom, the fact that in their young state they are found floating in the upper waters does not appear to the writer a sufficient disproof of the previously accepted belief that they live also at the bottom. And the fact that the thickened shells, when filled with their sarcodic contents, are so much heavier than sea-water as at once to sink to the bottom when placed in a vessel of that liquid seems strongly to indicate that so soon as adult growth (with successional increase in the number of chambers) has been attained, the carbonate of lime which the animal continues to separate from the sea-water is applied to the thickening of the shell, which will then sink to the bottom of the sea in virtue of its increased specific gravity. And since other *Foraminifera* undoubtedly pass their whole lives on the ocean-bottom, drawing their sustenance from sea-water in the manner already explained, there seems no reason why the subsidence of *Globigerinæ* to similar depths should put an end to their vital activity. It is only in the surface-stratum of the globigerina-ooze, however, that the shell-chambers are occupied by sarcodic bodies. Its sub-surface layer consists partly of still recognizable fragments of the shells, diffused through a mass of amorphous particles, which appears to be the product of a still further disintegration of their substance; whilst the yet deeper layers of the "ooze" consist entirely of amorphous particles, all trace of shells being lost. It was observed in various parts of the "Challenger" voyage that in particular areas the "globigerina-ooze" was altogether wanting (being replaced by a red clay, probably resulting from the metamorphosis of volcanic products), even though the living animals were found as usual in the upper waters; and the absence of this calcareous deposit on the sea-bottom seemed attributable to the pressure resulting from its very great depth—between 2500 and 3000 fathoms—which, with the aid of carbonic acid contained in all sea-water, would exert a solvent action, thus restoring to it these portions of the great calcareous deposit of which the materials had been drawn from it by the living *Globigerinæ*.

The higher forms of the Globigerine type constitute two principal series, in one of which the chambers succeed each other along a straight axis, whilst in the other they form a spire. One of the most common types of the first group is the *Textularia* (14 in fig. 1), in which the chambers are arranged bi-serially, those of the two sides alternating with each other, and each communicating with the chamber above and below it on the *opposite* side; as is well seen in the "internal cast" (fig. 17, A), which is an exact model (in glauconite or some other ferruginous silicate) of the sarcodic body that occupied the shell. The type of the second group is the almost universally diffused *Rotalia*, in which the chambers are disposed in a *turbinoid* spire (18 in fig. 1), through which passes a continuous stolon-process (as shown in the internal cast, fig. 17, B), lying on the lower and inner side. Of this type there are several very interesting modifications. Thus, in *Discorbina* (15, fig. 1) the chambers are flattened out over the surface to which the shell adheres; while in *Planorbulina* (17 in fig. 1) the early spiral plan soon gives place to the cyclical, and the shell thenceforth spreads, by concentric additions, over the surface to which it adheres. In those most-developed forms of this type which occur in warmer seas, the later-formed chambers do not merely surround the earlier, but are piled up more or less regularly upon them; and we find such aggregations spreading over the surfaces of shells, or clustering round the stems of zoophytes. Two of the most remarkable modifications of the planorbuline type, which strikingly illustrate the extremely wide range of variation among Foraminifera, are *Polytrema* and *Orbitolina.* The former, which was described by Lamarck as a coral, under the name of *Millepora rubra*, is a very common parasite upon shells and corals from the warmer seas,—sometimes spreading itself out horizontally in the form of a depressed cone, sometimes rising up from a small base in an arborescent growth, and sometimes developing itself into knobby excrescences. In all these varieties, the structure of the individual chambers, and their mode of communication with each other, remain essentially the same,—the diversity in the aggregate forms being simply due to the want of any definite plan of increase. The *Orbitolinæ* (Lamarck), which occur abundantly in certain beds of Chalk, seem to have been gigantic forms of the planorbuline type, represented at the present time by some comparatively minute organisms found on the Australian coast, which commence life as *Planorbulinæ,* and then, by the sequential addition of chambers both above and below, as well as at the margin, come to acquire a sugar-loaf or a globular form. The size of the globular examples of fossil *Orbitolinæ*, which, like the flints of chalk, are often found in Tertiary strata, varies from that of a small pea to that of a large bullet. There is a spreading *Orbitolina* in the Chalk, which sometimes attains the extraordinary diameter of *four inches.* These forms are of peculiar interest, as showing the tendency of the Foraminiferal type to that indefinite Zoophytic extension, of which we have the highest example in the *Eozoön* to be presently described.

The highest forms of the *Rotaline* type (which are confined to tropical seas) correspond with those of the "Nummuline" in the complexity of the organization of their shells, which only reveals itself to microscopic investigation. Each chamber has its own complete chamber-wall, so that the partitions which separate two contiguous chambers are double; and between these we find an additional deposit of calcareous substance, which the writer has designated as the "intermediate skeleton." This deposit is channelled-through by a set of canals distributed upon a regular plan, and altogether forming a "canal-system" (fig. 18). These do not communicate directly with the chambers, but give passage to sarcodic extensions formed by the coalescence of pseudopodia that have passed through the pores

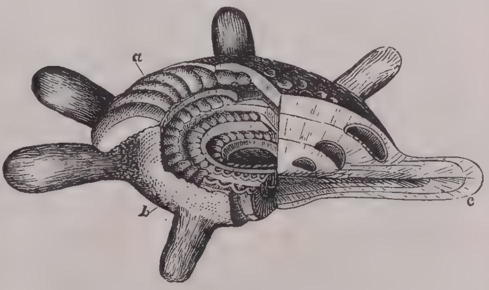

FIG. 19.—*Calcarina* laid open: *a*, tubulated wall of chambers; *b*, intermediate skeleton, extending into outgrowths; *c*, channelled by canal-system.

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[1] Sir W. Thomson in *Voyage of the Challenger*, vol. i., p. 213.

of the proper chamber-walls. And as the development of this "canal-system" is exactly proportionate to that of the "intermediate skeleton," it may be affirmed with some confidence that, as the formation of the latter proceeds, in the first instance, from the sarcodic expansion which covers the exterior of the chamber-walls, so it is continued by the prolongation of that expansion into the "canal-system." Now, in *Calcarina* (so named from its resemblance to a spur-rowel, fig. 19) we find an extraordinary development of this intermediate skeleton,—which so completely envelops the original rotalian shell, that nothing can be seen of its chambers externally, save towards the termination of the last whorl of the spire, and which extends itself into club-shaped outgrowths that have no connection with the chambered spire except through the canal system. There is no other recent Foraminifer at present known in which the "intermediate skeleton" and the "canal-system" attain such a remarkable development; and it was under the guidance of the structure of *Calcarina*, as previously elucidated by the writer's microscopic inquiries, that Dr. Dawson was first led to recognize the "canal-system" in *Eozoön canadense*, and thus to determine its Foraminiferal character—as will be presently explained.

Another very interesting type which must be placed in the "globigerine" series on account of the coarseness of the perforations of its shell-wall, but whose spiral mode of growth differs entirely from that of ordinary Rotalians, is the *Fusulina* of the Carboniferous Limestone (fig. 20). This bears so strong a resemblance in form to the *Alveolina* of the "Milioline" series (fig. 10), that it was for a long time associated with that type, although differing from it in the opening of its chambered interior by a single fissure along the middle of the lip, instead of by a row of pores. The interior, instead of being minutely divided into a number of separate chamberlets, is found to consist essentially of a symmetrical spire of simple chambers, each of which extends on either side into an "alar prolongation," analogous to that of other spirally growing Foraminifera. But these alar prolongations, instead of overlapping the preceding whorls, as in Nummulites, are prolonged in the direction of the axis of the spire, those of each whorl projecting beyond those of the preceding, so that the shell is elongated with every addition to its diameter. These alar extensions are constricted at intervals, so as to form linear series of partially divided chamberlets, and frequently take a somewhat irregular course; so that when the shell is traversed by sections (fig. 20) these reveal an aggregation of chamberlets (like those of the investing whorls of Nummulites, fig. 24), in which no definite arrangement can at first be traced.

The Family *Nummulinida*, of which the well-known fossil *Nummulite* is a characteristic example, includes the greater part of the largest and most elaborately constructed of the "vitreous" Foraminifera. Various plans of growth prevail in this family; but its distinguishing characters consist in the completeness of the wall that surrounds each segment of the body (the partitions between the chambers being double), in the density and fine tubulation of the shell-substance, and in the presence of an "intermediate skeleton" with a "canal-system" for its nutrition. This last, however, is altogether wanting in the smallest and more feebly developed examples of the group, such as *Nonionina* (19 in fig. 1), and is scarcely traceable in the small *Polystomella crispa* (16 in fig. 1), one of the most common of British Foraminifera, though in the large *Polystomella* of tropical seas the canal-system presents a regular development not approached elsewhere. This is specially displayed by "internal casts" of this shell (fig. 21), that have been fortunately obtained by the decalcification of specimens in which the sarcodic contents of the chambers had been replaced by mineral deposit, so as to give an exact model of the original animal.

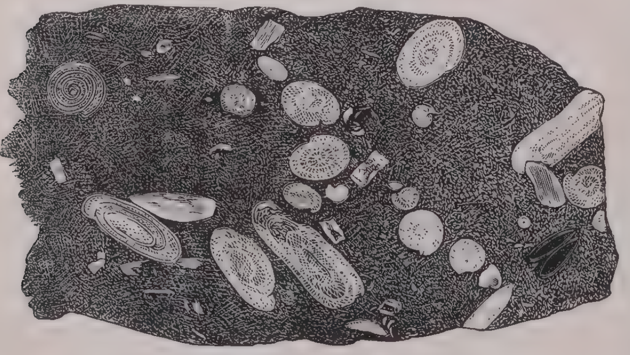

Fig. 20.—Section of *Fusulina* Limestone.

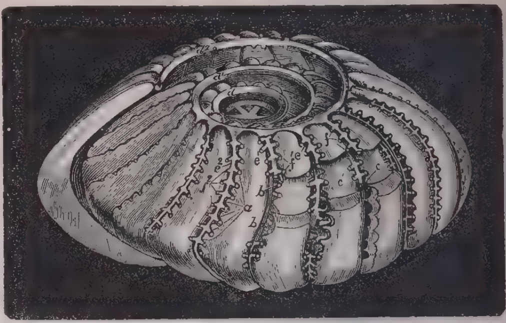

Fig. 21.—Internal cast of *Polystomella craticulata*: a, retral processes, proceeding from the posterior margin of one of the segments; b, b^1, smooth anterior margin of the same segment; c, c^1, stolons connecting successive segments and uniting themselves with the diverging branches of the meridional canals; d, d^1, d^2, three turns of one of the spiral canals; e, e^1, e^2, three of the meridional canals; f, f^1, f^2, their diverging branches.

The *Nummuline* type is most characteristically represented at the present time by the genus *Operculina*, which is so intimately related to the true Nummulite by intermediate forms that the two types cannot be separated by any definite boundaries, notwithstanding the dissimilarity of their most characteristic specimens. This genus is represented in temperate seas by small and feeble examples; but it attains a much higher development in tropical seas, the largest existing *Operculina*, however, only attaining the size of the smaller fossil *Nummulites*. As the organization of *Operculina* affords the clue, not only to that of the great Nummulitic series, which, at the commencement of the Tertiary epoch built up an immense mass of limestone that girdled a large part of the globe, but also to that of the far more ancient *Eozoön*, it will be described in some detail. The shell is a compressed nautiloid spire (fig. 22), the breadth of whose earlier convolutions increases in regular progression, but of which the last convolution (in full-grown specimens) usually flattens itself out like that of *Peneroplis* (5 in fig. 1). As a rule, the shell-wall of each whorl of the spiral completely invests all the preceding whorls; and each chamber-cavity (fig. 22, c, c) is continued from the margin towards the centre by two "alar prolongations," one on either face of the spire (c', c'), which are filled during life by extensions of the sarcodic segments that occupy the successive chambers. The size and extent of these "alar prolongations" differ much in different varieties of *Operculina*, and often in different parts of the same shell,—being, as a rule, least marked in proportion as the spire flattens itself out. There is often no external indication of them, the successive whorls of the spire being visible from the centre to the margin; but in vertical sections the spiral lamina of each whorl is still seen to be continued over the whole of the preceding whorl, even to the centre of the spire, though it may adhere to it everywhere except near its margin. The chambers are separated by double septa, which are shown in transverse section at d, d; these do not extend internally quite to the margin of the preceding whorl, but leave a fissured aperture, by which each chamber communicates with the one behind and before it, and the last chamber with the exterior, as seen at a'''. The "spiral lamina," which encloses the chambers and their "alar prolongations," is perforated by minute closely-set tubuli of about $\frac{1}{10000}$th of an inch in diameter; the orifices of these are seen on the internal wall of the chambers to be disposed with great regularity, as in fig. 23; and they seem normally to run parallel to each other (fig. 24), so as to open with equal regularity on the external surface. But in their passage from the interior towards the exterior of the shell these tubuli sometimes approach and sometimes diverge from one another, so that the pseudopodia which pass through them issue forth in closely-set bundles, separated by intervening spaces of non-tubular shell. These imperforate portions are harder than the porous shell, and often project as ridges or tubercles, forming a more or less regular "sculpturing" of the surface. They frequently correspond to the septa beneath, which are themselves composed of non-tubular shell-substance, and are overlaid by ridges of the same vitreous imperforate material. Nothing can be more inconstant, however, than this sculpturing, even on different parts of the same shell; so that it cannot be accounted as of the least value as a specific character. The outer edge of the spire is bounded by a peculiar band, of different structure from the rest, which may be distinguished as the "marginal cord" (fig. 22, *a, a*). This band, instead of being perforated by minute parallel tubuli, is traversed by a set of larger canals, inosculating with each other, and forming part of the "canal-system,"—the peculiarity of its character being clearly shown in vertical sections of well-preserved fossil Nummulites (fig. 24, *b, b*). The "canal-system" consists in the first place of a pair of "spiral canals," which run along the edges of the marginal cord, communicating with each other through its system of inosculating passages; while from each of these there pass off into spaces left between the two layers of each septum (as shown at *d′, d″*, fig. 22) a series of "interseptal canals," the distribution of which—marked out by causing them to imbibe colored fluid—is seen in the septa *e, e*. The general arrangement of this canal-system will be better understood by reference to that of *Polystomella* shown in its "internal cast" (fig. 21),—the position of the "spiral canals," however, as well as the distribution of their branches, being very different.

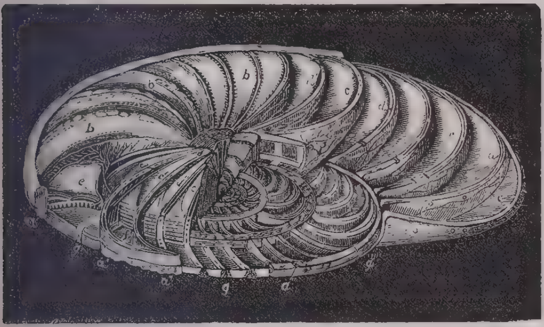

FIG. 22.—*Operculina* laid open, to show its internal structure; *a*, marginal cord seen in cross section at *a′*; *b, b*, external walls of the chambers; *c, c*, cavities of the chambers; *c′, c′*, their alar prolongations; *d, d*, septa divided at *d′, d′*, and at *d″*, so as to lay open the interseptal canals, the general distribution of which is seen in the septa *e, e*; the lines radiating from *e, e* point to the secondary pores; *g, g*, non-tubular columns.

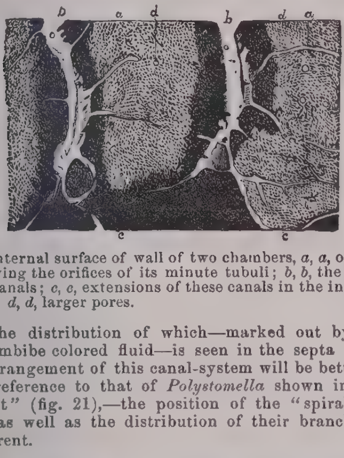

FIG. 23.—Internal surface of wall of two chambers, *a, a*, of Nummulite, showing the orifices of its minute tubuli; *b, b*, the septa containing canals; *c, c*, extensions of these canals in the intermediate skeleton; *d, d*, larger pores.

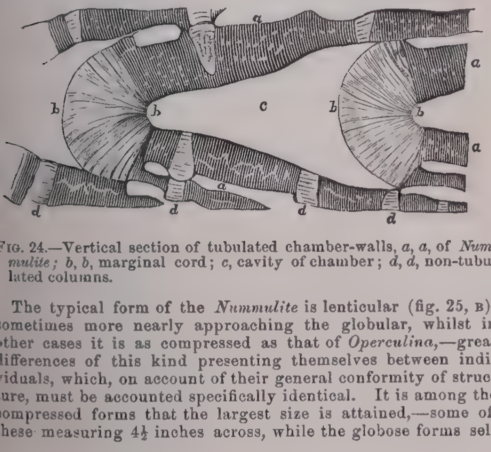

FIG. 24.—Vertical section of tubulated chamber-walls, *a, a*, of *Nummulite; b, b*, marginal cord; *c*, cavity of chamber; *d, d*, non-tubulated columns.

The typical form of the *Nummulite* is lenticular (fig. 25, B), sometimes more nearly approaching the globular, whilst in other cases it is as compressed as that of *Operculina*,—great differences of this kind presenting themselves between individuals, which, on account of their general conformity of structure, must be accounted specifically identical. It is among the compressed forms that the largest size is attained,—some of these measuring 4½ inches across, while the globose forms seldom much exceed an inch in diameter. The distinction which separates the typical *Nummulites* from the typical *Operculinæ* consists in this, that in the former the earlier whorls are completely invested by the alar prolongations of the later,—the successive turns of the spiral lamina being separated over their whole surface from those internal and external to them by intervening spaces, as shown in fig. 26, so that the spire is but little, if at all, discernible on the surface. On the other hand, we never find the later whorls of true Nummulites flattening themselves out marginally, like those of the typical Operculinæ; and there even seems reason to believe that when the spire has attained its full growth, it tends to close itself in. Curious differences are seen in the course and arrangement of the "alar prolongations;" and it has been proposed to group the numerous modifications of the Nummulitic type in accordance with these differences. Thus, in some of these, the alar prolongations extend in a regular *radial* direction from the margin to the centre of each whorl of the spire, being separated by corresponding radial prolongations of the marginal septa. In other instances, again, they follow a *sinuous* course, the septa prolonged from those of successive chambers still remaining distinct from one another. From these, again, we pass to a group in which the septa inosculate, so as to break up the alar prolongations into subdivisions, the partitions between which (as seen in fig. 26) show themselves in vertical sections in far greater numbers than the proper septa. And by a further increase of this subdivision, a complete reticulation is formed between the successive whorls of the spiral lamina, by the complex inosculation of the septal prolongations. Now, although it would not be difficult to arrange a collection of Nummulites under a number of specific types founded on these characters, if account were only taken of the specimens showing the most strongly marked differences, yet when due attention is given to the intermediate forms, they are found to present such a transitional gradation as to make it impossible to draw any absolute differential lines between the numerous components of the series.—The canal system of *Nummulina* bears a close resemblance to that of *Operculina;* and it is sometimes brought into beautiful distinctness in fossil specimens by the infiltration of ferruginous or other fossilizing material. And sometimes fragmentary "internal casts" present themselves, which admirably display the distribution of parts of the system (fig. 27).

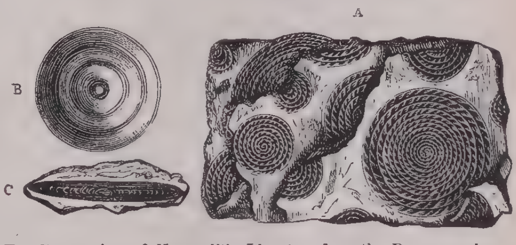

FIG. 25.—A, piece of *Nummulitic Limestone* from the Pyrenees, showing Nummulites laid open by fracture through the median plane; B, vertical section of *Nummulite;* C, *Orbitoides.*

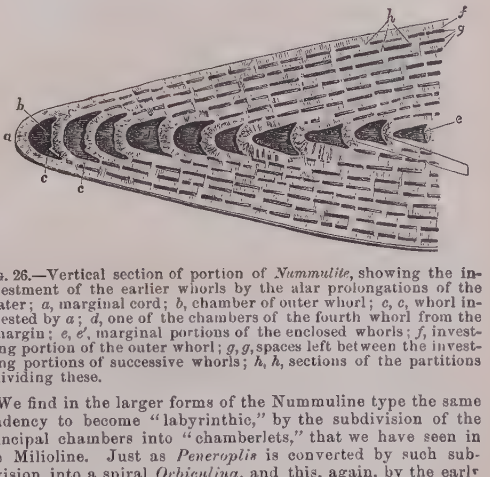

FIG. 26.—Vertical section of portion of *Nummulite*, showing the investment of the earlier whorls by the alar prolongations of the later; *a*, marginal cord; *b*, chamber of outer whorl; *c, c*, whorl invested by *a*; *d*, one of the chambers of the fourth whorl from the margin; *e, e′*, marginal portions of the enclosed whorls; *f*, investing portion of the outer whorl; *g, g*, spaces left between the investing portions of successive whorls; *h, h*, sections of the partitions dividing these.

We find in the larger forms of the Nummuline type the same tendency to become "labyrinthic," by the subdivision of the principal chambers into "chamberlets," that we have seen in the Milioline. Just as *Peneroplis* is converted by such subdivision into a spiral *Orbiculina*, and this, again, by the early exchange of the spiral for the cyclical plan of growth, into the cyclical *Orbitolite*, so *Operculina*, without any other departure from the ordinary Nummuline type, becomes *Heterostegina* (fig. 28); whilst the substitution of the cyclical for the spiral plan of growth produces the discoidal *Cycloclypeus* (fig. 29), the largest *existing* Foraminifer yet discovered, its diameter sometimes reaching 2½ inches. This is the recent representative of the very important fossil type *Orbitoides*, examples of which present themselves very abundantly in many localities in association with Nummulites (fig. 25, c), which they so closely resemble as to be easily mistaken for them. Some of them are very thin flattened disks, of the proportion shown in vertical section in fig. 30; while others have two or three times the proportionate thickness. Each disk has a central plane of chamberlets (figs. 31, 32, *b*, *b*) resembling that of *Cycloclypeus*, arranged with a general but not constant regularity in concentric circles; but whilst in the recent type this central plane is enclosed above and below by successive lamellæ of tubular shell-substance not separated from each other by any intervening spaces, the superposed lamellæ of *Orbitoides* are composed of chamberlets of irregular form (figs. 31, 32, *a*, *a*), which are piled up, one upon another, communicating vertically by minute apertures in their shell-walls. This arrangement obviously corresponds with that of the most *reticulate* forms of Nummulites. Another important link of affinity between *Orbitoides* and *Cycloclypeus* is furnished by the disposition of the canal-system, which, allowance being made for the *cyclical* plan of growth of the former, as contrasted with the *spiral* plan of the latter, is essentially the same in the two types. This, moreover, is beautifully shown in "internal casts" of *Orbitoides* found by Professor Ehrenberg in the Greensand; which, though fragmentary, display a canal-system precisely resembling that which the writer had worked out in *Cycloclypeus* by the examination of sections of the shell.

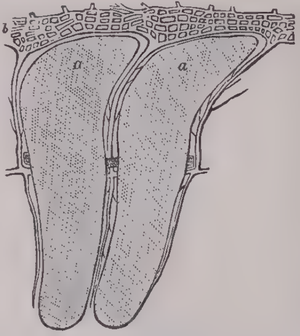

FIG. 27.—Internal cast of two chambers, *a*, *a*, of *Nummulina*, the radial canals between them passing into *b*, marginal plexus.

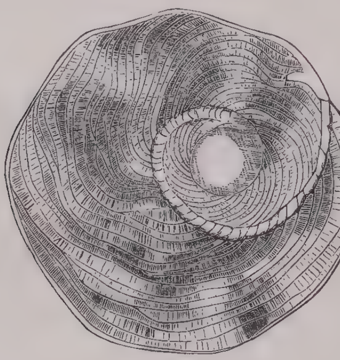

FIG. 28.—*Heterostegina.*

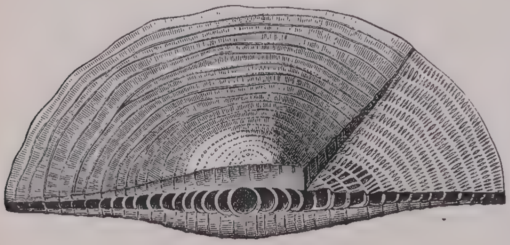

FIG. 29.—*Cycloclypeus.*

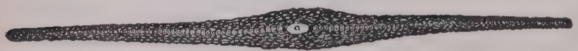

FIG. 30.—Vertical section of *Orbitoides*; *a*, primordial chamber.

It has been by the study of such "internal casts," recent and fossil, taken in connection with the microscopic appearances shown in thin sections of its calcareous layers, that the Foraminiferal nature of the Serpentine-limestone of Canada has been elucidated, of which some of the deepest beds of the *Laurentian* formation (the earliest series of stratified rocks at present known) are composed, and which has its parallel in certain beds that lie near the base of the "fundamental gneiss" of central Europe. In order that the evidence of the organic origin of this rock —a point of the highest palæontological and petrological interest—may be properly understood, regard must be had to what is even now going on in the depths of the ocean. The animals that form the enormous mass of globigerina-ooze at present in course of deposit over vast areas of the sea-bottom increase and multiply by *limited* gemmation; that is the size of each *individual* shell, which depends upon the number of segments of which it is composed, is restricted by the cessation of *continuous* gemmation after a definite number of segments has been produced. An indefinite extension of the type, however, is provided for by the detachment of further segments, which, increasing by gemmation, in their turn give origin to new shells. In the larger Foraminiferal types last described, on the other hand, *continuous* gemmation proceeds much further; and thus we may have in an *Orbitolite*, a *Nummulite*, or a *Cycloclypeus*, hundreds or even thousands of chambers, all formed by the segmental extension of the animal body from one "primordial segment." Further, in *Polytrema* we find a rotaline shell extending itself by the continuous gemmation of the animal, without any definite limit either of size or shape,—its increase taking place by *vertical* as well as by *horizontal* gemmation, so that it develops itself into forms which are essentially zoophytic. Hence there is nothing in the nature of Foraminiferal organization in the least degree inconsistent with the idea that a shell essentially "Nummuline" in its character should extend itself indefinitely by the continuous gemmation of the animal that forms it, not merely over horizontal planes, but also in the vertical direction, so as to produce solid massive structures bearing a strong general resemblance to Coral growths.

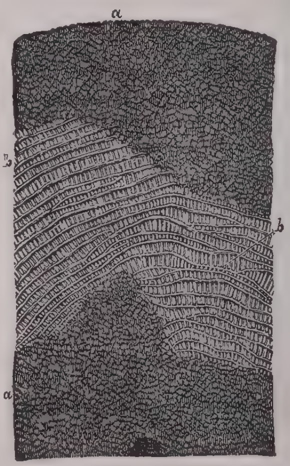

FIG. 31.—Horizontal section of disk of *Orbitoides*; showing at *b*, *b* the chamberlets of the median plane, and at *a*, *a* those of the superposed lamellæ.

Again, the dead shells of *Foraminifera* brought up from many parts of the sea-bottom are found to have their cavities filled with green or ochreous ferruginous silicates, which seem allied in composition to the "glauconite" of the Greensand formation; and these mineral deposits occupy not merely the chambers of the shell, but its canal-system also; so that when the calcareous shells have been dissolved away by dilute acid (which does not act on their contents), internal casts are obtained, which are perfect models, not only of the soft sarcodic segmented body of the animal, but also of its extensions into the canal-system that traverses the substance of the intermediate skeleton (figs. 21, 27). Yet further, this mineral deposit sometimes penetrates the minute tubuli of the shell itself; so that the surface of the internal cast of each chamber is beset with little points which represent the pseudopodia that extended themselves into those tubuli from each sarcodic segment. There can be no reasonable doubt that these "internal casts" are formed by a process of chemical "substitution,"—the animal body, in the progress of its decay, being replaced, particle by particle, by ferruginous silicates precipitated from sea-water by the liberation of ammonia. And the explanation of the fact that this replacement only occurs in particular localities (notably in the Ægean, over the Agulhas bank near the Cape of Good Hope, and on certain parts of the Australian coast) probably lies in some local peculiarity in the composition of the sea-water, which may not improbably be due to the discharge from submarine springs of water containing an unusual quantity of the materials of the deposit.

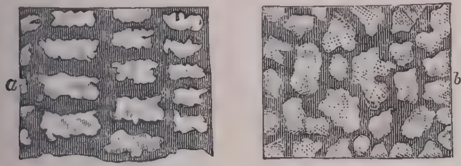

FIG. 32.—Chamberlets of the superposed lamellæ *a*, and of the median plane *b*, of *Orbitoides*, more highly magnified.

Now there is ample evidence that a similar process has taken place at various geological periods. For, as was first pointed out by Professor Ehrenberg, the *green sands* which occur in different formations from the Silurian to the Tertiary epoch (being especially characteristic of the earlier Cretaceous) consist very largely (though not exclusively) of the "internal casts" of *Foraminifera*,—as is shown by microscopic examination of their grains. Examples of such casts, which can be referred without the least difficulty to known Foraminiferal types, have been already given (figs. 17, 27). Hence there is no inherent improbability in such an occupation of the chamber-cavities, of the canal-system, and even of the minute tubulation, of a still earlier Foraminiferal structure, formed by the indefinite extension of a Nummuline growth into coral-like masses. And as there is every reason to believe that the composition of ocean-water has varied greatly at different geological periods, and especially that it contained magnesian salts at earlier epochs in much larger quantity than at present, it might be expected that the silicates which replace the soft tissues of the animals of the earliest organisms should be essentially magnesian. This expectation has been singularly confirmed by the fact ascertained by Dr. Sterry Hunt, that in certain Silurian Limestones from Wales and New Brunswick, the segments of Crinoidal stems have the soft animal tissue, which originally filled the interspaces of their calcareous network, replaced by a silicate of alumina, iron, magnesia, and potass—intermediate between glauconite and serpentine. Now, the Serpentine-limestone that lies near the base of the Laurentian formation in Canada is ordinarily composed of alternating layers of carbonate of lime (in the condition of calcite) and of silicate of magnesia (serpentine),—these layers being superposed upon one another with great general regularity (as shown in fig. 33), and frequently exceeding fifty of each kind in number. In some localities, however, the calcite is replaced by dolomite (magnesian limestone), while the serpentine is replaced either by loganite (a compound of silex, alumina, magnesia, and iron), or by some other magnesian silicate; but the alternation of calcareous and siliceous lamellæ is just as regular in these cases as in the typical ophicalcite, and there is every probability that the dolomitic layers were originally formed as calcite, and subsequently metamorphosed by magnesian infiltration. The regularity of this alternation of calcareous and siliceous lamellæ, which has no parallel in any undoubted mineral, taken in connection with the resemblance of the entire formation (extending continuously over hundreds of square miles) to ancient coral reefs, having suggested to Sir William Logan its organic origin, a careful microscopic examination of specimens that seemed to have been least altered by metamorphic action was made at his instance by Dr. Dawson of Montreal, with results that left him in no doubt either of the organic nature of the calcareous lamellæ, or of the Foraminiferal affinities of the organism. These results were confirmed by the writer of this article, whose re-examination of the subject, to meet the objections raised from time to time against Dr. Dawson's conclusions, has only had the effect of strengthening his original conviction of their truth. And the following general sketch of the structure of *Eozoön canadense* is here presented with full confidence, as expressing, not merely his own views, but those of the numerous eminent naturalists who have examined for themselves the evidentiary facts placed before them.[1]

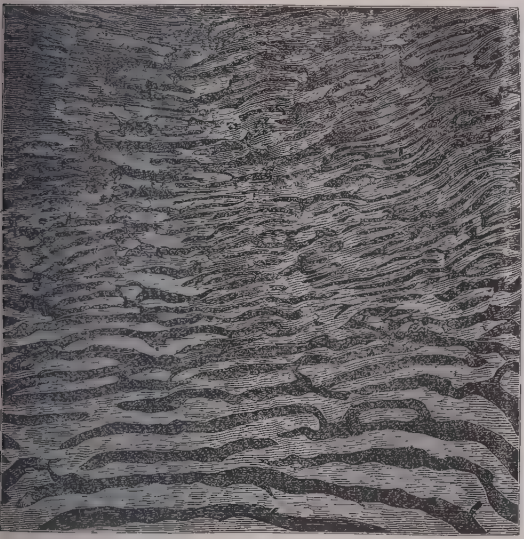

FIG. 33.—Section of the Eozoic Serpentine-limestone of Canada, showing alternation of calcareous (light) and serpentinous (dark) lamellæ.

The *calcareous* lamellæ of the Canadian Ophicalcite, which are always thickest near the base of the mass, are superposed one upon another so as to include between them a succession of "stories" of chambers (fig. 34, A^1, A^1, A^2. A^2),—the chambers of each "story" opening one into the other, as at *a*, *a*, like apartments *en suite*, but being occasionally divided by complete septa, as at *b*, *b*, which are traversed by passages of communication between the chambers they separate. Each layer of shell consists of two finely-tubulated or "Nummuline" lamellæ, B, B, which form the boundaries of the chambers above and beneath, and of an intervening deposit of homogeneous shell-substance, C, C, which constitutes the "intermediate skeleton." The amount of this varies considerably in different layers, while the thickness of the "proper wall" of the chambers (or "Nummuline lamella") remains almost constant, the distinction between the two being just as marked (in well-preserved specimens) as it is in the recent *Calcarina* (fig. 19). The tubuli of the "Nummuline" lamellæ are usually filled up (as in the Nummulites of Nummulitic Limestone) by mineral infiltration, so as to present only a fibrous appearance in thin transparent sections; but it fortunately happens that, through its having escaped such infiltration, the tubulation (fig. 35, *a*, *a*) is occasionally as distinct as it is in recent Nummuline shells, bearing a strong resemblance in its occasional waviness (as at *a′ a′*) to that of a crab's claw. The "intermediate skeleton," whenever it forms a thick layer, is penetrated by arborescent systems of canals (fig. 34, E, E), which are often distributed so extensively and so minutely through its substance as to leave very little of it without a branch. These canals (fig. 35, *b*, *b*) take their origin, not directly from the chambers, but from irregular *lacunæ* or interspaces between the outside of the proper chamber-walls and the "intermediate skeleton," exactly as in *Calcarina*,—the extensions of the sarcode body which occupied them having apparently been formed by the coalescence of the pseudopodial filaments which had issued forth through the tubulated lamellæ. It is to be remarked that the substance, not merely of the intermediate skeleton, but of the Nummuline layer, is traversed by oblique lines, indicating the cleavage-planes of calcite. This is what is constantly seen in fossilized calcareous organisms—

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[1] Of those who may be considered as qualified by special study of the *Foraminifera* to form a judgment on this matter, Mr. H. Carter is the only one who has expressed his dissent; and he has never seen the most characteristic specimens of *Eozoic* structure. On the other hand, the late Professor Max Schultze, who took up the inquiry towards the end of his life, not only publicly and most explicitly expressed his conviction that the canal-system found in the calcareous lamellæ *must* be organic, but left behind him an elaborate Memoir on the subject, with ample illustrations, which unfortunately still remains unpublished.

such as the shells and spines of *Echinida*, or the stems of *Crinoidea*—which retain their organic arrangement unchanged, and thus affords no basis whatever for the contention that these calcareous layers are purely mineral. On the other hand, the fact that the portions of the canal-system, shown in thin sections (fig. 35), continually *cross* the cleavage planes, instead of lying between them, furnishes a strong objection to the hypothesis that the appearances which have been interpreted as indicating a regular distribution of ramifying canals can have been produced by mineral infiltration. Further, the distinct continuity of these cleavage-lines through the "Nummuline layer" (fig. 35, *a*, *a*) proves this layer to be essentially *calcareous*,—the layer of serpentine-fibres which is commonly found in its place after decalcification being a secondary deposit, formed in the manner to be presently described.

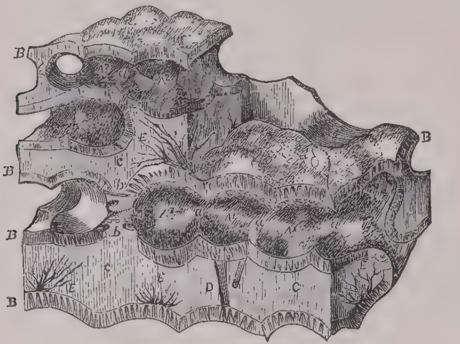

FIG. 34.—Calcareous skeleton of *Eozoön canadense:* A^1, A^1, chambers of lower story; A^2, A^2, chambers of upper story, imperfectly divided at *a*, *a*; B, B, tubulated or Nummuline layers; *c*, *c*, intermediate skeleton; D, large passage from one story to another; E, E, E, branching canal-systems.

When a well-preserved fragment of *Eozoön* has been treated with dilute acid, so as to dissolve away the calcareous lamellæ, we have an "internal cast" in serpentine, which gives us a precise model of the sarcodic body by which the cavities of the calcareous structure were originally occupied. We see, in the first place (fig. 36), that each of the layers of serpentine forming the lower part of such a specimen shows more or less of a segmental arrangement,—being, in fact, made up by the coalescence of a number of minute serpentinous granules, such as are shown separately or but slightly coalescing in the upper part of the figure. This shows that there is not that difference between the regularly "lamellated" and the "acervuline" plans of growth which might at first sight be supposed,—the chambers having been separate in the latter, whilst in the former they constituted imperfectly subdivided galleries. In those wider spaces between the serpentine-layers, which were originally occupied by the thicker calcareous layers forming the "intermediate skeleton," we find internal casts of the branching canal-system; and the development of this system is found, as in recent Foraminifera, to bear a constant relation to the amount of the secondary calcareous deposit. But further, in specimens in which the "Nummuline" layer was originally well preserved, and in which the decalcifying process has been carefully managed, that layer is represented by a thin white film covering the exposed surfaces of the segments; as is shown superficially over the upper part of fig. 36, and in section, along the margins of the serpentine-layers, in the lower. When this film is examined with a sufficient magnifying power, it is found to consist of extremely minute needle-like fibres of serpentine; which sometimes stand upright, parallel, and almost in contact with one another, like the fibres of asbestos, but which are frequently grouped in converging brush-like bundles, so as to be very close to each other in certain spots at the surface of the film, whilst widely separated in others,—thus indicating exactly the same irregularities in the grouping of the tubuli that (as already mentioned) we find in recent Nummulines. And it is not unfrequently seen that where bundles of these fibres converge towards the surface, so that the pseudopodial threads they represent would have issued forth in clusters, the internal casts of the canal-system take their origin in such aggregations. We have here, in fact, in this most ancient of all fossils at present known, the most complete model we possess of any extinct animal, extending even to its soft sarcodic threads of less than $\frac{1}{10000}$th of an inch in diameter,—this model being conformable in all essential particulars to the "internal casts" of existing *Foraminifera* which are at present in course of production on the sea-bottom.

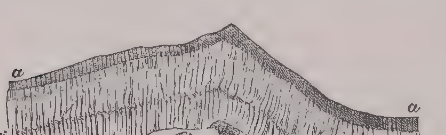

FIG. 35.—Highly-magnified section of a portion of the calcareous skeleton of *Eozoön canadense; a*, *a*, Nummuline layer showing parallel tubuli with a wavy bend along the plane *a'*, *a'*; *b*, origins of canal-system penetrating the intermediate skeleton *c*, *c*, which is traversed obliquely by cleavage planes that pass on into the Nummuline layer.

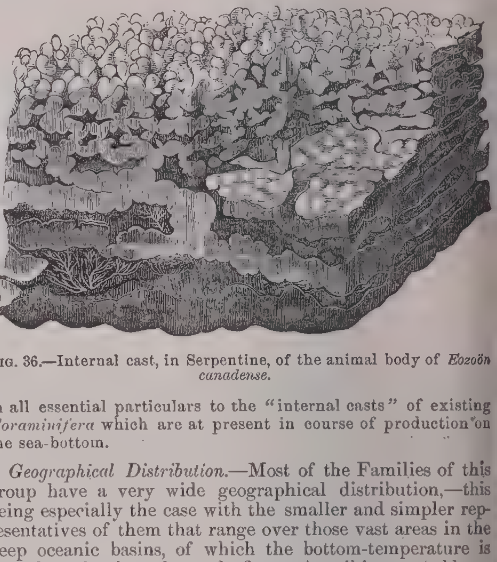

FIG. 36.—Internal cast, in Serpentine, of the animal body of *Eozoön canadense.*

Geographical Distribution.—Most of the Families of this group have a very wide geographical distribution,—this being especially the case with the smaller and simpler representatives of them that range over those vast areas in the deep oceanic basins, of which the bottom-temperature is kept down by the polar underflow. A striking resemblance has long been noted between the poor and feeble Foraminiferal fauna of shallow waters in colder temperate seas, and that of great depths in tropical seas; and this similarity is now explained by the correspondence of the temperature to which these two faunæ are subjected. The larger and most developed examples of existing *Foraminifera*, on the other hand, are limited to the shallower seas near tropical shores, or covering coral reefs where the bottom-temperature is comparatively high; or to partially enclosed seas, like the Mediterranean and Red Sea, which are cut off from the polar underflow by the shallowness of the straits which connect them with the oceanic basin. It is in such seas that we meet with the largest *Orbiculinæ*, and the most complex *Orbitolites* and *Alveolinæ*,—the first of these "imperforate" types being generally abundant in tropical shore-sands, the second in shallow dredgings along the Australian coast, the great barrier-reef, and the lagoons of "atolls" in the Coral Sea, while the third seems to attain its highest development in the Philippine Seas. So, again, among the "perforate" *Lagenida*, we find the "nodosarian" and "cristellarian" types attaining a very high development in the Mediterranean; the most complex forms of the "rotalian" type, including the zoophytic *Polytrema*, are only met with in tropical or sub-tropical seas; while, with the exception of small and modified *Polystomellæ* and dwarfed *Operculinæ*, there are no known representatives in the colder-temperate or polar seas either of the gigantic *Cycloclypeus*, or of the large *Operculina* and *Heterostegina* of the tropics. But while the Foraminiferal fauna thus obviously depends on an elevated temperature for the attainment of its highest development as regards the size and complexity of its individual members, the numerical multiplication of its lower forms (as is the case in many other groups) seems to be favored by a much lower degree of warmth; so that we find the vast area of "globigerina-ooze" extending to the borders of the Polar seas. There, however, it ceases almost abruptly, the place of this calcareous deposit being taken by an accumulation of the siliceous skeletons of Radiolarians and Diatomaceæ.

It is not a little curious, however, that recent researches should have disclosed the fact, that the existing Arenaceous *Lituolida* attain their highest development—in regard no less to size and complexity of structure than to number—on the *deep* sea-bottom,—the additions to our previous knowledge of the Foraminiferal fauna made by the dredgings of the "Porcupine," the "Valorous," and the "Challenger" having been far greater in this section than in either of the calcareous-shelled groups. And it would hence appear that an elevated temperature is not as essential to the high development of the *Foraminifera* which construct "tests" by gluing together grains of sand, as it is to that of the shell-forming types which separate the material of their "porcellanous" or "vitreous" skeletons from the sea-water in which they live.

Geological Distribution.—There is no division of the Animal Kingdom whose range in time (so far as is at present known)[1] can be compared with that of the *Foraminifera.* Looking, indeed, to the vast series of ages that must have been required for the deposit of that long succession of Upper Laurentian and Huronian rocks which intervenes between the Eozoic Limestone of the Lower Laurentians of Canada, and the lowest strata in which the most ancient representatives of the Palæozoic fauna have as yet been found, it may even be said that all other fossils are modern by comparison. For the interval between the formation of the Canadian *Eozoön* and the period represented by the oldest fossils of the Lower Cambrian series seems undoubtedly to have been quite as great—geologically speaking—as that which intervened between the latter and the existing epoch, if not greater,—the "fundamental gneiss" of Sir Roderick Murchison, which represents in central Europe the Laurentians of Canada and near the base of which is found the kindred *Eozoön bavaricum,* having a thickness estimated at 90,000 feet, and being overlaid by a great thickness of other non-fossiliferous rocks. Hence the determination of the organic origin of this Ophicalcite, and of its Foraminiferal affinities which has been effected by the examination and comparison of parts of specimens so minute as to be scarcely visible to the naked eye, must be considered as one of the most remarkable results of microscopic research—fully equal in importance, when considered in all its bearings, to the discovery by Prof. Ehrenberg of the Foraminiferal origin of Chalk.[2]

Indications of Eozoic structure have been found in various strata of uncertain age underlying the Silurians of North America, and also in some of the older rocks of the Scandinavian series; and there is no improbability in the idea that its existence may have been prolonged through the whole of that long period, commonly regarded as azoic, which has been designated by Prof. Dana as *Archæan.* In the earliest strata usually accounted fossiliferous there are found, alike in the old and new continents, a number of curious organisms, sometimes of considerable size, which have received the names *Archæocyathus, Stromatopora,* and *Receptaculites.* The nature of these is still problematical, their internal structure not having yet been fully elucidated; but while it seems probable, on the one hand, that among the organisms whose similarity of external conformation has led to their association under these names, there may be several types of structure essentially different, there seems considerable reason to believe that some among them are really gigantic *Foraminifera,* presenting approximations to calcareous Sponges. The Limestones of the Silurian period have not been as yet minutely searched for the smaller forms of *Foraminifera;* but green sands of Silurian age occur in various localities, the grains of which can be identified as "internal casts" of Foraminiferal shells.

It is in the Carboniferous Limestone that we first recognize a varied and abundant Foraminiferal fauna, which has recently been made the subject of special study by Mr. H. B. Brady,[3] whose very interesting results may be summed up as follows. (1) Of the "imperforate" or "porcellanous" *Foraminifera* no examples have been detected. (2) Of the "perforate" or "vitreous" series, on the other hand, each principal group is represented: the *Lagenida* very slightly; the *Globigerinida* by *Textularia* and various *Rotalian* types; while of the *Nummulinida* we find, not only three generic forms that are at the same time individually small and scantily diffused, but (in certain localities) such an accumulation of comparatively large shells of *Fusulina* (fig. 20), that they constitute almost the sole material of calcareous beds extending over large areas. (3) A large proportion of the Foraminiferal types of this period belong to that "arenaceous" group which at present contains not merely the *Lituolida,* whose "tests" are entirely made up of cemented sand-grains (among which the *Saccammina,* fig. 5, *a, b,* is distinctly recognizable), but also a number of generic types more or less allied to the recent *Valvulina,* in which there is a "vitreous" shelly basis, more or less thickly incrusted by an arenaceous envelope. The "isomorphism" of these with true "nodosarines" and "rotalines" suggests the question whether they are not really in an evolutionary stage between the true sandy-tested and the completely calcareous-shelled types.

But there is a larger question even than this,—namely, whether those massive beds of Carboniferous Limestone whose texture is sub-crystalline, and in which scarcely any traces of organic structure are now discernible, do not owe their origin, like analogous beds of the Cretaceous formation, to Foraminiferal life. The general tendency of recent geological opinion has been to account for the absence of all traces of organic structure in such beds by the "metamorphism" they have undergone subsequently to their original deposition. Of the completeness with which such metamorphism may obliterate the evidence of organic origin in calcareous rocks it is impossible to have more "pregnant instances" than those afforded by the purely crystalline marble of Carrara, which is unquestionably a metamorphic Oolite, and the crystalline conversion of the Antrim Chalk in the neighborhood of the basaltic outburst which forms the Giant's Causeway. The abundance of Corals, however, in various beds of Carboniferous Limestone, accompanied by such accumulations of Brachiopods, Crinoids, etc., as might have been associated with them on coral reefs, taken in connection with the fact that the substance of existing reef-building corals, when raised by upheaval, sometimes exhibits a metamorphism that causes it to bear a close resemblance to carboniferous limestone, has seemed to favor the belief that the azoic sub-crystalline beds of that formation had their origin in Coral growths. Against this, however, it may be urged that we have at the present time no *continuity* of Coral growth over areas that are at all comparable to those which we find continuously covered with Carboniferous Limestone; that the real parallel to these is presented by the continuous beds of Chalk formerly deposited over vast marine areas, by those of the Nummulitic Limestone of the succeeding period, and by those of Globigerina-ooze still in progress of production; and that, if the tropical sea-bottom were now elevated into dry land, we should find over the deeper areas a continuous Foraminiferal deposit, interrupted in particular localities by upheaved reefs of Coral, whose slopes would be covered with calcareous-shelled Mollusks, Echinoderms, etc., bearing a general correspondence with the great Carboniferous Limestone formation.

Moreover, it has now come to be generally admitted that "metamorphism" is connected with mechanical disturbance, and especially with that "lateral thrust" which is the principal source of the plication and contortion of strata, and which must have given rise to the evolution of great heat. That such a change was extensively produced in the Carboniferous rocks of Great Britain at the end of the Palæozoic period, when the horizontal and continuous Coal-measures were thus broken up into separate "basins," bordered by intervening ridges formed by the uplifting of their subjacent limestone, is universally recognized. But, on the other hand, over the vast area of Russia that lies between the Baltic and the Ural mountains, there seems to have been no such force in action. Its strata are so nearly level that the determination of their order of superposition has been difficult. And there is such a remarkable absence of metamorphism even in those of Silurian age that we there find what are elsewhere *slates* represented by beds of *clay*, constituting the original form of that deposit which has elsewhere acquired the slaty character by subsequent metamorphism. Now, since it is here that we also find the most extensive development of *Fusulina*-limestone in the place of those sub-crystalline beds which elsewhere form the great bulk of the Carboniferous Limestone, there seems exactly the same reason for regarding such a Foraminiferal deposit as the original form of those beds. And this view derives remarkable confirmation from the phenomena presented by the Carboniferous Limestone of Ireland, which has been recently studied with great care by Prof. Hull.[1] This formation extends over a very considerable area of the island, —constituting in its central portion an elevated plateau, whose nearly horizontal strata present no indication of lateral thrust, whilst along the margin of this area the calcareous strata have been elevated into ridges by thrust from the outside, with more or less of plication and contortion. Now, in these marginal ridges the traces of organic origin are scanty,—the presence of fossils, whether large or minute, being the exception and not the rule. In the level strata of the central plateau, on the other hand, the evidence of organic origin is almost everywhere complete; and whilst fossil Corals, Mollusks, Crinoids, etc., are abundant in particular beds, great masses of the limestone are found by microscopic examination to consist of little else than minute Foraminiferal shells. A very strong case, then, seems made out for the belief that Foraminiferal life has contributed very largely to the production of those vast beds of Carboniferous Limestone (often exceeding 1500 feet in thickness) in which scarcely any trace of organic origin can now be found,—this share bearing to that of the Corals, which are generally credited with the whole, somewhat of the same proportion that the Foraminiferal ooze of the deep-sea bottom at the present time does to the Coral reefs of shallow waters, and the shells of Mollusks and Echinidans that live among them.

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[1] Appearances resembling Annelid burrows have been found in Laurentian rocks; but these cannot be safely relied on as evidence of the existence of Marine Worms at that epoch.

[2] "The discovery of organic remains in the crystalline limestones of the ancient gneiss of Canada," says Prof. Gümbel, the accomplished director of the Geological Survey of Bavaria, "for which we are indebted to the researches of Sir William Logan and his colleagues, and to the careful microscopic investigations of Drs. Dawson and Carpenter, *must be regarded as opening a new era in geological science.*"

[3] *Monograph of the Carboniferous and Permian Foraminifera,* published by the Palæontographical Society, 1876.

In the earlier Secondary rocks we do not find by any means the same evidence of abundant Foraminiferal life; but this is very probably to be accounted for by the conditions of their deposition. For during the Triassic period we find no representative of a deep oceanic calcareous deposit,—the only considerable limestone bed (the muschelkalk) being obviously composed of the remains of the more developed fauna of comparatively shallow water. It is interesting, however, to find certain clay beds of the New Red Sandstone yielding *Foraminifera*, chiefly of the Cristellarian type; which can be identified—not only generically and specifically, but even varietally—with forms common in the Italian Tertiaries, and still living in the Mediterranean. In many of the Liassic clays *Foraminifera* are found in great abundance; and here the "porcellanous" group first characteristically shows itself under one of its least modified types, the *Spiroloculina*. In the formation of many Oolitic Limestones it seems probable that *Foraminifera* had a considerable share. For while the material of many of the calcareous beds belonging to this formation was obviously furnished by débris of Coral, Echinoderms, and Mollusks, the nuclei of the component grains of the true *Oolitic* beds are so often found to be minute *Foraminifera*, that we seem justified in regarding those beds as having been formed by a sub-aërial metamorphosis of shore-sands largely composed of the minute shells belonging to that group, like many tropical shore-sands of the present time.

It was by the comparative study of specimens of Chalk brought from different localities that Professor Ehrenberg was first led to the conclusion[2] that this vast formation was mainly produced by the progressive accumulation and subsequent disintegration of the minute shells of various types of *Foraminifera*, especially *Globigerina* (fig. 14),—a conclusion to which Professor W. C. Williamson was independently led by his study of the "Levant mud," a white chalk-like deposit at present in progress of formation on the comparatively shallow bottom of the eastern end of the Mediterranean.[3] This conclusion has been fully borne out by the deep-sea soundings and dredgings since carried on; which have established the fact that large areas of the great ocean-basins are covered to an unknown thickness by a Foraminiferal ooze, which, when dried corresponds in every particular with ordinary Chalk. And there is, moreover, very strong evidence that this deposit is not a repetition of the old Chalk formation, but an actual *continuation* of it over areas which have undergone no such upheaval as that which raised the chalk of Europe, Asia, and America into dry land. Not only the Chalk, but the subjacent Greensand appears to have originated in great degree in Foraminiferal life,—its glauconite grains being (in the localities in which they seem to have undergone least attrition) internal casts of easily-recognizable types of that group, formed by the process already described as still going on upon parts of the existing sea-bottom. Various larger types of all the principal groups of *Foraminifera* occur in different parts of the Cretaceous formation,—the "porcellanous" sub-order being now fully represented.

The highest development of the Foraminiferal type, as measured by the extraordinary abundance of its largest and most complex examples, seems to have been attained in the early Tertiary period, to which belongs the vast formation of Nummulitic Limestone, forming a band often of 1800 miles in breadth, and sometimes attaining several thousand feet in thickness, which may be traced eastwards from the Atlantic shores of Southern Europe and Northern Africa (the Pyramids being built of this rock, and on a terrace formed by it) through Western Asia to Northern India and China, and likewise over large areas in North America—thus taking, to use the words of Sir Charles Lyell, a far more conspicuous part than any other Tertiary group in the solid framework of the earth's crust. In some localities it seems to lie conformably upon Cretaceous strata, so as to establish the continuity between the latest Secondary deposits and the earliest Tertiaries formed in the deep sea. In some localities this Limestone is essentially composed of an aggregation of *Nummulites* (including, however, the fossil remains of higher organisms), the spaces between the large and entire shells being filled in by minuter forms and by the débris of previous generations of the larger; whilst in other localities the *Nummulites* are replaced, wholly or in part, by *Orbitoides* and *Orbitolites*. In the Paris basin the Nummulitic Limestone is represented by the *Calcaire grossier*, which is for the most part of Foraminiferal origin. Its lower calcareous beds are chiefly Nummulitic; but in the middle part of the series we find the *Miliotine* group predominating, some of its beds being chiefly composed of *Orbitolites*, whilst others (notably those of which a large

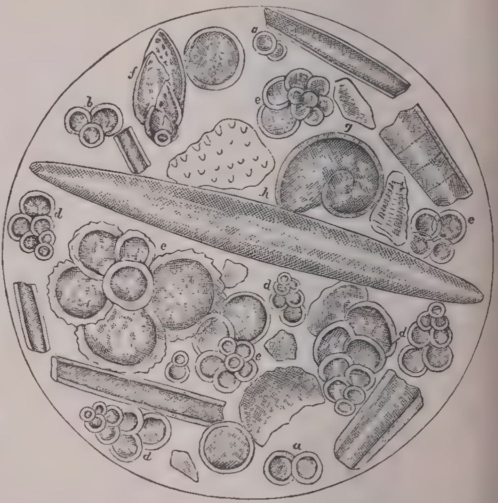

Fig. 37.—Microscopic Organisms in Chalk from Gravesend: *a, b, c, d. Textularia globulosa; e, e, e, e, Rotalia aspera; f, Textularia aculeata; g, Planularia hexas; h, Navicula.*

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[1] *Physical Geography and Geology of Ireland*, 1878.

[2] "Ueber die Bildung der Kreidefelsen und des Kreidemergels durch unsichtbare Organismen," Berlin, 1838.

[3] *Memoirs of the Manchester Philosophical Society*, vol. viii.

part of Paris is built) are essentially made up by the aggregation of the smaller *Miliolæ*. The calcareous sand of Grignon, which consists in great part (like many beds of the Oolitic formation) of shells comminuted by the action of the waves, contains a great abundance of *Foraminifera*,—among them the large and complex *Dactylopora*, which is only represented at the present time by a minute form of extreme simplicity. In various marine deposits of the middle and later Tertiary periods, especially those which form the slopes of the Apennines, *Foraminifera* are abundant; but the larger forms gradually give place to the smaller, and the Foraminifera fauna progressively approximates more closely to that of the present time.

Altogether it would certainly be not too much to affirm that so far as we are justified by positive evidence, no single group of the Animal Kingdom has contributed, or is at present contributing, so largely as the one of which a sketch has now been given to the formation of the crust of the earth,—by separating carbonate of lime from its solution in sea-water, and thus restoring to the solid form the vast quantity of that material which is continually being taken up in solution, and discharged into the oceanic basin, by the percolation of rain-water through the calcareous strata which have been elevated into dry land, which are thus undergoing continual degradation. And if the origin of the great part of the Carboniferous Limestone in Foraminiferal rather than in Coral life be accepted as probable, the share taken by Foraminiferal life in this process during the Palæozoic period would appear to have been fully equalled by that which it took in the formation of the Chalk, and in the production of the Nummulitic Limestone, of more modern geological epochs. (W. B. C.)

FORBACH, a town of Lorraine, Germany, the chief town of a circle, is situated on an affluent of the Rossel and on the Metz and Saarbrücken Railway, about 5½ miles southwest of Saarbrücken. Its industries include brewing, tanning, and the manufacture of glass, soap, and pasteboard. At a short distance from the town are the large iron-works of De Wendel, Enkel & Company, which employ about 1500 workmen. There are also large coal mines in the vicinity. Forbach possesses a real school, a higher female school, a Catholic and two Protestant churches, and a synagogue. After the battle on the neighboring heights of Spicheren, August 6, 1870, in which the French under General Frossard were defeated by the Germans under Prince Frederick Charles, the town was occupied by the German troops, and at the conclusion of the war it was annexed to Germany. The population in 1875 was 6178.

FORBES, ALEXANDER PENROSE (1817–1875), bishop of Brechin, was born at Edinburgh, June 6, 1817. He was the second son of Lord Medwyn, a judge of the Court of Session, and grandson of Sir William Forbes of Pitsligo. He studied first at the Edinburgh Academy, then for two years under the Rev. Thomas Dale, the poet in Kent, passed one session at Glasgow university, and, having chosen the career of the Indian civil service, completed his studies at Haileybury College. In 1836, he went to Madras, but in consequence of ill-health, the result of the climate, he was obliged after two or three years to return to England. He then entered Brasenose College, Oxford, where in 1841 he obtained the Boden Sanskrit scholarship, and in 1844 took his degree of B.A. He was at Oxford during the early years of the great religious movement known for some time as Puseyism, and he was powerfully influenced by association with its leaders, Newman, Pusey, and Keble, and entered heartily into their views and aims. In 1844 he was ordained deacon and priest in the English Church, and held an English curacy; but being naturally attracted to the Episcopal Church of his native land, then recovering from long depression, he removed in 1846 to Stonehaven, the chief town of Kincardineshire. The same year, however, he was appointed to the vicarage of St. Saviour's, Leeds, and co-operated in a mission formed there, with strong Romanizing tendencies, which ere long collapsed. In 1847 Forbes was called to succeed Bishop Moir in the see of Brechin. He removed the episcopal residence to Dundee, where he resided till his death, combining the pastoral charge of the congregation with the duties of the see. He labored in season and out of season, never sparing himself when work was to be done, and won not only golden opinions but warm affections, especially among the working classes. Through his energy and devoted endeavors several new churches were built in Dundee, and among them the pro-cathedral of St. Paul's. He was once prosecuted in the church courts for heresy; the accusation being founded on his primary charge, delivered and published in 1857, in which he set forth his views on the eucharist. He made a powerful defence of the charge, and was acquitted with "a censure and an admonition." Keble wrote in his defence, and was present at his trial at Edinburgh. Forbes was a good scholar, and above all a scientific theologian, and his social qualities were such as to endear him to all who knew him. He was author of treatises on the Nicene Creed and the Thirty-nine Articles, various commentaries and devotional works, discourses, and reviews. He died at Dundee, October 8, 1875.

FORBES, DAVID (1828–1876), F.R.S., an accomplished traveller, mineralogist, metallurgist, chemist, and writer on chemical geology, brother of Professor Edward Forbes, was born at Douglas, Isle of Man, and received his early education there and at Brentwood in Essex. When a boy he manifested "an enthusiastic disposition as regards science," and at the age of fourteen had already acquired a remarkable knowledge of chemistry. This subject he studied at the university of Edinburgh, and he was still young when he was appointed superintendent of the mining and metallurgical works at Espedal in Norway. Subsequently he became a partner in the firm of Evans & Aiken, nickel-smelters, of Birmingham, and in that capacity visited Chili, Bolivia, and Peru. He died in London, December 5, 1876. Micro-petrology and chemical geology owe much to the researches of David Forbes. Besides reports for the Iron and Steel Institute, of which, during the last years of his life, he was foreign secretary, he wrote upwards of 50 papers on scientific subjects, among which are the following:—"The Action of Sulphurets on Metallic Silicates at High Temperatures," *Rep. Brit. Assoc.*, 1855, pt. ii. p. 62; "The Relations of the Silurian and Metamorphic Rocks of the south of Norway," *Ib.*, p. 82; "The Causes producing Foliation in Rocks," *Journ. Geol. Soc.*, xi., 1855; "The Chemical Composition of the Silurian and Cambrian Limestones," *Phil. Mag.*, xiii. pp. 365–373, 1857; "The Geology of Bolivia and Southern Peru," *Journ. Geol. Soc.* xvii. pp. 7–62, 1861.

FORBES, DUNCAN (1685–1747), of Culloden, was born at Bunchrew or at Culloden near Inverness on the 10th of November, 1685. After he had completed his studies at the universities of Edinburgh and Leyden, he was admitted advocate at the Scottish bar in 1709. His own talents and the influence of the Argyll family secured his rapid advancement, which was still further helped by his loyalty to the Hanoverian cause at the period of the rebellion in 1715. In 1722 Forbes was returned member for Inverness, and in 1725 he succeeded Dundas of Arniston as lord advocate. He inherited the patrimonial estates on the death of his brother in 1734, and in 1737 he attained to the highest legal honors in Scotland, being made lord president of the Court of Session. As lord advocate, he had labored to improve the legislation and revenue of the country, to extend trade and encourage manufactures, and no less to render the Government popular and respected in Scotland. In the proceedings which followed the memorable Porteous mob, for example, when the Government brought in a bill for disgracing the lord provost of Edinburgh, for fining the corporation, and for abolishing the town-guard and city-gate, Forbes both spoke and voted against the measure as an unwarranted outrage on the national feeling. As lord president also he carried out some useful legal reforms; and his term of office was characterized by quick and impartial administration of the law. The rebellion of 1745 found him at his post, and it tried all his patriotism. For some years before, he had repeatedly and earnestly urged upon the Government the expediency of embodying Highland regiments, putting them under the command of colonels whose loyalty could be relied upon, but officering them with the native chieftains and cadets of old families in the north. "If Government," said he, "pre-engages the Highlanders in the manner I propose, they will not only serve well against the enemy abroad, but will be hostages for the good behavior of their relations at home; and I am persuaded that it will be absolutely impossible to raise a rebellion in the Highlands." Such a plan was afterwards successfully pursued by Chatham; but, though Walpole is said to have approved of the scheme, it was not adopted by the council. On the first rumor of the Jacobite rising Forbes hastened to Inverness, and through his personal influence with the chiefs of Macdonald and Macleod, those two powerful western clans were prevented from taking the field for Charles Edward; the town itself also he kept loyal and well protected at the commencement of the struggle, and many of the neighboring proprietors were won over by his persuasions. His correspondence with Lord Lovat, published in the Culloden papers, affords a fine illustration of his character, in which the firmness of loyal principle and duty is found blended with neighborly kindness and consideration. But at this critical juncture of affairs, the apathy of the Government interfered considerably with the success of his negotiations. Advances of arms and money arrived too late, and though Forbes employed all his own means and what money he could borrow on his personal security, his resources were quite inadequate to the emergency. It is doubtful whether these advances were ever fully repaid. Part was doled out to him, after repeated solicitations that his credit might be maintained in the country; but it is evident he had fallen into disgrace in consequence of his humane exertions to mitigate the impolitic severities inflicted upon his countrymen after their disastrous defeat at Culloden. The ingratitude of the Government, and the many distressing circumstances connected with the insurrection, sunk deep into the mind of Forbes. He never fairly rallied from the depression thus caused, and after a period of declining health he died on the 10th of December, 1747, in the sixty-second year of his age.

Forbes was a patriot without ostentation or pretence, a true Scotsman with no narrow prejudice, an accomplished and even erudite scholar without pedantry, a man of genuine piety without asceticism or intolerance. His country long felt his influence through her reviving arts and institutions; and the example of such a character in that coarse and venal age, and among a people distracted by faction, political strife, and national antipathies, while it was invaluable to his contemporaries in a man of high position, is entitled to the lasting gratitude and veneration of his countrymen. In his intervals of leisure he cultivated with some success the study of philosophy, theology, and biblical criticism. He is said to have been a diligent reader of the Hebrew Bible. His published writings, some of them of importance, include—*A Letter to a Bishop, concerning some Important Discoveries in Philosophy and Theology* (1732); *Some Thoughts concerning Religion, natural and revealed, and the Manner of Understanding Revelation* (1735); and *Reflections on Incredulity* (2d ed. 1750). His correspondence was collected and published in 1815, and a memoir of him (from the family papers) was written by Mr. Hill Burton, and published along with a *Life of Lord Lovat*, in 1847. His statue by Roubiliac stands in the Parliament House, Edinburgh.

FORBES, Edward (1815–54), F.R.S., a celebrated naturalist, was born at Douglas, in the Isle of Man, February 12, 1815. While still a child, when not engaged in reading, or in the writing of verses and drawing of caricatures—ever favorite recreations with him—he occupied himself with the collecting and arranging of insects, shells, minerals, fossils, specimens of plants, and other natural history objects. From his fifth to his eleventh year, delicacy of health precluded his attendance at any school, but in 1828 he became a day scholar at Athole House Academy in Douglas, where he was universally beloved by his companions, and was recognized by his master as an apt if not a good scholar. In June, 1831, he left the Isle of Man for London, where during four months he studied drawing under Mr. Sass, a well-known artist. In October, however, having given up all idea of making painting his profession, he returned home; and in the following month he matriculated as a student of medicine in the university of Edinburgh. During his first winter session there he attended lectures on anatomy, theoretical chemistry, and materia medica; and in the ensuing summer session botany, natural history, and practical chemistry claimed his attention. His vacation in 1832 he spent in diligent work on the natural history of the Isle of Man. In 1833 he made a tour in Norway, the botanical results of which were published in Loudon's *Magazine of Natural History* for 1835–36. In the summer of 1834 he visited the Isle of Man and Wales, and devoted much time to dredging in the Irish Sea; and in the succeeding year he travelled in France, Switzerland, and Germany. Born a naturalist, and having no relish for the practical duties of the surgeon or physician, Forbes was no zealous student of medicine, and he finally in the spring of 1836 abandoned the idea of taking a medical degree, resolving to devote himself to science and literature. The winter of 1836–37 found him at Paris, where he attended the lectures at the Jardin des Plantes on natural history, comparative anatomy, geology, and mineralogy. Leaving Paris in April, 1837, he repaired to the south of France, whence he went to Algiers, and during a month there spent he obtained materials for a paper on land and freshwater Mollusca, published in the *Annals of Natural History*, vol. ii. p. 250. In the autumn of the same year he registered at Edinburgh as a student of literature; and in 1838 appeared his first volume, *Malacologia Monensis*, a synopsis of the species of Manx Mollusca. During the summer of 1838 he visited Styria and Carniola, and made extensive botanical collections. In the following autumn he read before the British Association at Newcastle a paper on the distribution of terrestrial Pulmonifera in Europe, and was commissioned to prepare a similar report with reference to the British Isles. On returning to Edinburgh he delivered a course of 15 lectures on the natural history of the animals in the British seas. In 1841 was completed the publication of Forbes's great work, *A History of British Star-fishes*, embodying the results of researches carried on for a long series of years, and containing 120 illustrations, inclusive of humorous tail-pieces, all designed by the author. On April 17th of the same year Forbes, accompanied by his friend William Thompson, joined at Malta H.M. surveying ship "Beacon," to which he had been appointed naturalist by her commander Captain Graves. From that date until October, 1842, he was busily employed in investigating the botany, zoology, and geology of the Mediterranean region. The results of his researches were made known in his "Report on the Mollusca and Radiata of the Ægean Sea, presented to the British Association in 1843," and in *Travels in Lycia*, published in conjunction with Lieut. Spratt in 1846. In the former treatise he discussed the influence of climate and of the nature and depth of the sea bottom upon marine life, and divided the Ægean into eight biological zones; his conclusions with respect to bathymetrical distribution, however, have been shown by later investigators to require certain considerable modifications. Towards the end of the year 1842 Forbes, whom family misfortunes had now thrown upon his own resources for a means of livelihood, sought and obtained the curatorship of the collections of the Geological Society of London. To the duties of that post he, in May of the following year, added those of the professorship of botany at King's College, where he lectured with success to the second largest botanical class in London. On November 1, 1844, having resigned the curatorship of the Geological Society, he became palæontologist to the Geological Survey, with a yearly salary of £300. In 1846 Forbes published in the *Memoirs of the Geological Survey*, i. 336, his important treatise "On the Connection between the existing Fauna and Flora of the British Isles, and the Geographical Changes which have affected their Area." It is therein pointed out that, in accordance with the theory of their origin from various specific centres, the plants of Great Britain may be divided into five well-marked groups:—the W. and S.W. Irish, represented in the N. of Spain; the S.E. Irish and S.W. English, related to the flora of the Channel Isles and the neighboring part of France; the S.E. English, characterized by species occurring on the opposite French coast; a group peculiar to mountain summits, Scandinavian in type; and, lastly, a general or Germanic flora. From a variety of arguments the conclusion is drawn that the greater part of the terrestrial animals and flowering plants of the British Islands migrated thitherward, over continuous land, at three distinct periods, before, during, and after the glacial epoch. In the autumn of 1848 Forbes married the daughter of General Sir C. Ashworth. The year 1851 witnessed the removal of the collections of the Geological Survey from Craig's Court to the new museum in Jermyn Street, and the appointment of Forbes as professor of natural history to the Royal School of Mines just established in conjunction therewith. In 1852 was published the fourth and concluding volume of Forbes and Hanley's *History of British Mollusca*. In 1853 Forbes held the presidency of the Geological Society of London, and in the following year he obtained the fulfilment of a long-cherished wish in his appointment to the professorship of natural history in the university of Edinburgh vacant, by the death of Jameson, his former teacher. Since his return from the East in 1842, the determination and arrangement of fossils, the investigation of strata, frequent lectures, and incessant and wearing literary work, including the preparation of his admirable palæontological memoirs, and of a variety of scientific articles and reviews, had precluded Forbes from giving that attention to the natural history pursuits of his earlier life which he had for years earnestly desired. It seemed that at length he was to find leisure to reduce to order and commit to the keeping of the press those vast stores of biological information of which long-protracted and original research had made him the possessor. At Edinburgh, in the summer season of 1854, he lectured to a large and appreciative audience; and in September of that year he occupied the post of president of the geological section at the meeting of the British Association. He had already commenced his winter's course of lectures in Edinburgh when he was seized with feverishness, culminating in an attack of nephritic disease, from which he had on several previous occasions been a sufferer. His symptoms soon became alarming, and after not many days' illness he expired at Wardie, near Edinburgh, Nov. 18, 1854, in the fortieth year of his age.

See *Literary Gazette*, November 25, 1854; *Edinburgh New Philosophical Journal* (New Ser.), 1855; *Quar. Journ. Geol. Soc.*, May, 1855; G. Wilson and A. Geikie, *Memoir of Edward Forbes*, 1861, in which, pp. 575–583, is given a list of Forbes's writings. See also the Royal Society's *Catalogue of Scientific Papers*, vol. ii. pp. 654–658. (F. H. B.)

FORBES, James David (1809–1868), successively professor of natural philosophy in the university of Edinburgh and principal of the United College in the university of St. Andrews, was the fourth son of Sir William Forbes of Pitsligo, the lineal representative of the Forbeses of Monymusk and Pitsligo. His mother was Wilhelmina Belches-Stuart, sole child and heiress of Sir John Stuart of Fettercairn. Their family consisted of two daughters and four sons, of whom James David, born at his father's town house, 86 George Street, Edinburgh, on the 20th April, 1809, was the youngest. Two years after his birth, the death of Lady Forbes took place. Sir William retired with his family from Edinburgh to Colinton, his country residence, and thus it happened that, up to the age of sixteen, when he entered college, James Forbes was entirely a home-bred boy, and his only teacher the schoolmaster of the village. At an early age, however, he developed remarkable powers of self-education. Passionately fond of natural science, he stored his mind with all available knowledge of physics, constructed for himself astronomical instruments, and actually commenced a connected series of meteorological observations, which he kept up for many years. But these pursuits were carried on without the knowledge of his family; for Sir William had destined him for the bar, and Forbes loved his father too well to betray tastes and inclinations which might seem to point towards a different career. In November, 1825, he entered the university of Edinburgh, and joined the classes of Latin and chemistry. He still continued his self-imposed studies, and at length forwarded anonymously to Sir David (then Dr.) Brewster, who was at the time conducting the *Edinburgh Philosophical Journal*, a paper on "The Apparent Number of the Stars." It was at once inserted, and further communications were requested from the anonymous "Δ." The request was complied with, and during an extended tour through France, Germany, and Italy, in company with a large family party, Forbes contributed a number of papers on "The Physical Geography of the Bay of Naples," "The Horary Oscillations of the Barometer at Rome," and other subjects, all of which were inserted in the *Journal*. On his return to Scotland after a year's absence, he made himself known to Brewster as his unknown correspondent. Brewster, astonished at his extensive reading and remarkable powers of observation, encouraged him in his scientific pursuits and proposed him as a fellow of the Royal Society of Edinburgh, to which, at the age of 19, he was elected. In the mean time he had re-entered college, where his subsequent career was a distinguished one. In the class of moral philosophy, taught by the celebrated Professor Wilson, he gained the highest honors, and in Sir John Leslie's natural philosophy class he twice carried off the gold medal. An event now occurred which changed the whole tenor of his life. His father died on the 24th of October, 1828, and it became necessary that Forbes should seriously consider his future course of life. The choice lay between the bar and a scientific career, and after much consultation with his friends he chose the latter. He passed his law trials indeed, and put on his advocate's gown, but never wore it, for a competence given him by his father had rendered him independent. About this time Sir David Brewster was engaged in laying the foundations of the British Association. Forbes joined cordially in the work, and contributed much towards placing the Association on the basis it now occupies. Throughout the rest of his life he attended, with rare exceptions, all its meetings, often breaking off a foreign tour, and hastening back to do so. The presidency of the meeting held at Dundee in 1867 was offered to him, but ill health compelled him to decline it.

Immediately after his election as fellow of the Royal Society of London, in June, 1832, Forbes started on an extensive scientific tour, but was suddenly recalled from Geneva by news of the death of Sir John Leslie, professor of natural philosophy at the university of Edinburgh. Forbes had left word that should this chair at any time become vacant, he desired to be put in nomination, and on his return found that this had actually been done. He also found himself, to his surprise and dismay, the rival of his old friend Sir David Brewster. But Forbes was already committed, and had received testimonials from Whewell, Airy, Peacock, Vernon Harcourt, Chalmers, and others, bearing high testimony to his attainments, and the immense results they promised. After a more than usually excited contest, into which politics to some extent entered, Forbes was elected, at the age of twenty-four, to a professorial chair of the highest distinction. The inaugural lecture with which he opened the session of 1833–34 was listened to with unusual interest. As a professor, he more than realized the high expectations which had been formed of his special capacity for the work. During the twenty-seven years of his professorship his lectures left no branch of natural philosophy untouched, and owing to his thorough acquaintance with the literature of the subject, each of them was a mass of condensed information,—not, however, confined to old knowledge taken from books, but enriched from time to time by the results of original research, enlivened by many a happy illustration drawn from his travels and adventures, and rendered more effective by his clear ringing voice and graceful delivery. He soon gathered round him an enthusiastic body of hard-working students, and although the high standard he aimed at made him a somewhat strict disciplinarian, their personal interest in his researches and their pride in his success increased as years went on. Forbes took an interest in his students no less personal, and more than one acquaintance formed in the class-room ripened into a tender and affectionate friendship. But his energies were not confined to the work of his professorship; they soon made themselves felt throughout all the machinery of the university. The system of examination for degrees—already for some time in operation at Oxford—was then much wanted at Edinburgh, where, owing to the absence of any sufficient test of proficiency, graduation was little valued and seldom sought for. Forbes became an energetic reformer in this direction, and to him is mainly owing the complete system of examination for degrees which, under his guidance as dean of the faculty of arts, greatly tended to raise the standard of Scottish education. Again, in 1841, there was much discussion in the senatus as to the disposal of a large sum of money bequeathed by General Reid for the foundation of a chair of music and for other purposes. Forbes strongly opposed the idea of a musical professorship, urging that the money would be more usefully employed in providing retiring allowances for superannuated professors. But controversy ran high, litigation ensued, and after years of contention a part of the Reid bequest was assigned by the law courts to the chair of music. Next year another large sum, the Straton fund, had to be dealt with, and here again Forbes was instrumental in inducing the senate to devote what was left of the Reid bequest, combined with the Straton fund, to the foundation of fellowships to be held by distinguished students after graduation. In these and other controversies the uncompromising energy with which he strove to carry out his views of what was right could not fail to bring him into collision with men whose opinions were as decided, and their wills as strong as his own. When two such unbending natures as Sir William Hamilton and James Forbes came into contact—as they did more than once—the shock was a rough one; but although they differed widely in opinions, each has left a permanent mark for good on the university.

It would be impossible to enter here into the subjects or method of Forbes's class lectures; nor is it necessary to give more than a brief notice of the important researches which shared with his class work the winter months. They were the subject of voluminous private correspondence with such men as Whewell, Brewster, Peacock, Airy, Faraday, Arago, Melloni, Cauchy, and many others, and their results were embodied in a long list of communications to various scientific societies, ranging over a great variety of subjects.

For a paper on "The Transparency of the Atmosphere and the Laws of Extinction of the Sun's Rays passing through it," the Royal Society of London awarded him their Royal medal. Another, on "The Selective Absorption of the Sun's Light in passing through steam," was one of the first steps in the direction of spectrum analysis. In 1832 he described the experiments by which he succeeded in producing a spark by means of a natural magnet. He was the author of valuable memoirs on the thermal springs of the Pyrenees, the extinct volcanoes of the Vivarais (Ardêche), and the geology of the Cuchullin and Eildon hills. Soon after his elevation to the chair Forbes resumed his researches in heat, begun some years before. He commenced experiments with Melloni's thermo-multiplier, measured the refractive index of rock salt with heat from various sources, luminous and non-luminous, and pursued a course of investigations which led him to his most brilliant discovery, the polarization of non-luminous heat by transmission through tourmaline and thin mica plates, and by reflection from the latter. By employing mica for depolarization he succeeded in showing the double refraction of non-luminous heat, a fact of which this experiment remains the only proof. He also produced circularly polarized heat by two internal reflections, using Fresnel's rhombs made of rock salt. By these researches the identity of thermal and luminous radiations was finally established. In 1846 he made careful arrangements for the measurement of underground temperatures, and by sinking his thermometers in three different sets of surface materials, he obtained an absolute determination of the thermal conductivity of traptufa, sandstone, and pure loose sand. His experiments on the conductivity of metals occupied the closing years of his life. By a thoroughly original method he obtained quantitative measurements of the absolute thermal conductivity of iron at various temperatures, and showed that this is diminished (contrary to the assumption of Fourier) by increase of temperature, thus following the known laws of electrical conductivity.

Forbes generally devoted a part of each vacation to excursions with his family in various parts of Scotland, and to geological tours among his native mountains, in the course of which, at times in company with some scientific friend, more often alone, he traversed on foot the greater part of the Highlands. In 1856 he acquired a beautiful cottage near Pitlochrie in Perthshire, where the succeeding summers were chiefly spent. From 1835 to 1851 Forbes usually passed some months on the Continent, travelling, as he expressed it, not as an amusement, but as a serious occupation, with De Saussure before him as a model. And it may be almost doubted whether science did not profit as much by his summer travels as by his winter work.

His first tour was devoted to the geology of the Pyrenees and of the Vivarais—the latter of which he afterwards revisited. In 1837, after a short sojourn at Bonn, for the purpose of study, he travelled throughout Germany and Austria, making frequent experiments on terrestrial magnetism and other subjects. In 1839, among the crags and glaciers of Monte Viso, of the Pelvoux range, and of the Alps of Cogne, he learned to be an active and intrepid mountaineer; and during the intervals of his glacier investigations he did good service in opening up Alpine districts before scarcely known to Englishmen, by a series of excursions extending over the whole of the Pennine chain.

But of all his journeys and discoveries, those made by him among the mountains of Savoy are most popularly known; and their results have associated his name for ever with the glaciers of the Alps. In 1840, while presiding over the physical section of the British Association at Glasgow, he met M. Agassiz of Neuchâtel—who, after spending several years in the study of glacial phenomena, had just published his *Études sur les Glaciers*,—and agreed to visit Switzerland with him the following year. Accordingly, at the close of the session of 1840-41, Forbes joined Agassiz and his party at the well-known "Hôtel des Neuchâtelois," a small hut on the moraine of the Lauter Aar Gletscher. After a fortnight spent in exploration and observation, in the course of which Forbes called attention for the first time to the veined structure of glacier ice, they ended the campaign by the passage of the Ober Aar Joch, and the ascent of the Jungfrau. This was Forbes's apprenticeship in glacier observation,—a field of inquiry then jointly occupied by two rival theories, the gravitation or sliding theory of De Saussure, and the dilatation theory of Charpentier. After a close analysis of these Forbes not only showed conclusive physical reasons for rejecting both, but pointed out the impossibility of forming a sound theory of glaciers until the internal structure of these anomalous bodies had been investigated, and the character and velocity of thei motions ascertained.

These important data Forbes resolved to obtain for himself, and the summer of 1841 found him at Chamounix, engaged in a close examination of the Mer de Glace. He attacked the problem for the first time as a question of pure physics, executed accurate measurements with instruments of precision, and at once established the fact that the motion of a glacier averages roughly a foot in 24 hours, and that such motion is continuous. As his observations went on, he successively discovered that the centre of the glacier moves faster than the sides, and the surface than the ice vertically below it, that its velocity increases directly with the steepness of its bed, and that the motion of a portion of the glacier when embayed behind a rock is greatly diminished, and the whole mass distorted, without any solution of continuity taking place. Convinced by these discoveries that the resemblance between a glacier and a river, already noticed by Captain Hall, Msgr. Rendu, and others, was more than a mere analogy, he deduced from the above mentioned data the following theory of glacier motion: — *A glacier is an imperfect fluid or a viscous body, which is urged down slopes of a certain inclination by the mutual pressure of its parts.* In reply to the strongly urged objection that ice is by its nature a brittle solid, and not sensibly possessed of any viscous quality, he asserted that ice is only hard and crystalline at a temperature of 30° F. or lower, and that at 32° it is a plastic solid possessing a slight but perfectly sensible genuine molecular plasticity. When the urgency of the forces to which it is subjected causes this limit to be overpowered, a general bruise takes place, producing innumerable internal fissures, with finite displacements in certain planes, and subsequent restoration of continuity by "time and cohesion;" hence the blue bands of the conchoidal veined structure. When the urgency is still greater the mass acts like a solid, and crevasses open. In the case of glacier ice an additional element of plasticity exists, for glacier ice is scarcely ever coherent. It is usually a congeries of irregular polyhedrons tightly wedged together, possessing a rude flexibility, and always traversed by an infinity of capillary fissures. Hence a glacier is really a compound of ice and water, more or less plastic according to its wetness and infiltration,—a fact proved by its more rapid motion in summer when saturated with water, and its relative retardation in winter when the surface water remains frozen. Forbes's "viscous theory" was sharply criticised, but it is now universally accepted, subject to some modifications which do not affect the groundwork of the structure, and rather elucidate than disprove his conclusions. But besides scientific criticism, he was compelled to defend himself—which he did with complete success—against insinuations not only of plagiarism, but of an endeavor to suppress the rights of others to priority of discovery.

During the winter which followed this eventful summer, Forbes was busily engaged in writing his *Travels through the Alps of Savoy*, a charming contribution to Alpine literature, in which graphic descriptions of scenery and mountaineering are happily blended with accounts of his scientific researches. Its last lines were written almost on the eve of his marriage with Alicia, eldest daughter of the late George Wauchope, Esq. They started on their marriage tour to Switzerland, but had only got so far as Bonn when Forbes was attacked by a dangerous illness, and it was not until August that they reached the Alps. He was then so far restored as to be able to resume his observations on the glaciers of Chamounix and Grindelwald, but as the winter approached he was pronounced unequal to the work of the following session at Edinburgh. His request for permission to appoint a substitute was readily granted, and he set out with Mrs. Forbes for Italy. Naples and Rome were their headquarters until the end of May, and the summer months were passed at the Italian lakes and in Switzerland. Forbes returned to Edinburgh in the autumn of 1844, and carried on his work during the winter months, but his health had suffered a rude shock, from the effects of which he never entirely recovered. The succeeding summer was spent with his family in the Highlands of Scotland; but the vacation of 1846 found him again on the Mer de Glace, engaged in observations on the ablation of the surface of the glaciers, and the difference of movement between the surface and the underlying ice. His next and last visit to the Alps in 1850 was entirely occupied in putting the finishing touches to his survey of the Mer de Glace, which was for some years after its publication the only correct Alpine map in existence. At the close of the session of 1850–51 he started for Norway with the double purpose of observing a total eclipse of the sun visible at Bergen, and of comparing the phenomena of the Arctic glaciers with those of the Alps. These objects were not attained without great fatigue and exposure. Forbes returned from Norway with health much impaired, and had scarcely recommenced his work when he was attacked by hæmorrhage, the precursor of a long and dangerous illness. All through December he lay between life and death, but in January he was able to be removed to Clifton, which he made his headquarters for two years. During this enforced leisure he was constantly engaged in writing a very able "Dissertation on the Progress of Mathematical and Physical Science" for the pages of the *Encyclopædia Britannica*, and in preparing for the press a work on *Norway and its Glaciers*, similar in character to his *Glaciers of the Alps*, and scarcely yielding to it in picturesqueness of narrative or careful observation. In the summer of 1853 he was called from Clifton to Oxford to receive the honorary degree of D.C.L. During the three sessions of Forbes's absence his class work had been conducted by Professor Kelland, but the session of 1854–1855 found him again at his post, and he worked with but little interruption from illness until 1859, assisted latterly by Dr. Balfour Stewart. In that year the current of his life was turned into another channel. Owing to the translation of Sir David Brewster to the principalship of the Edinburgh university, the principalship of the United College of St. Andrews became vacant; Forbes offered himself as a candidate, and was successful. His commission bears date December 2, 1859, but he did not resign his professorship until the following April. The degree of LL.D. was then conferred on him by the university which his own labors had so greatly benefited and adorned.

His new post, although it relieved him of the fatigue of constant lecturing, was no sinecure. The Scottish University Commission were then in full session, and in their investigations of the affairs, financial and other, of his own college and of the university, the responsibility of supplying information and suggesting reforms fell largely on him. A zealous reformer he always was, and he had not left behind him at Edinburgh that dauntless spirit of "Thorough" which saw only one straight road to a right principle, and pursued it, not without collisions, and often painful ones. The duties of his office were performed with scrupulous industry. His own college is indebted to him for a laborious examination and classification of its ancient charters. He found the collegiate church of St. Salvator in a condition of tasteless neglect; he left it partially restored and greatly beautified. He occasionally lectured on glaciers, climate, heat, and others of his favorite subjects, and even strained his failing powers to complete his researches on the thermal conductivity of iron. For the latter, shortly before his death, the Keith medal was awarded to him.

In the spring of 1867 Forbes's health gradually declined, and towards the end of September he set out with his wife and three daughters to Cannes, and afterwards went on to Hyères. His health now continued to improve until the middle of January, when he was again attacked by hæmorrhage brought on by fatigue. He never sat up again, and while in that painful state the presidency of the Royal Society of Edinburgh was offered to him and declined. It was evident that a summer at Hyères was impossible, so he was conveyed, together with one of his daughters who was almost in the same sad condition as himself, to Clifton, where he lingered for eight months, awaiting his end with patient calmness, sustained by the deep and fervent religious faith which had characterized his boyhood, and which a life of active scientific research had strengthened rather than impaired. He died on the 31st of December, 1868.

Forbes received the honorary degree of D.C.L. from Oxford, and that of LL.D. from the university of Edinburgh. The Royal Society of London awarded him their Rumford medal for his discovery of the polarization of heat, and their Royal medal for a paper on the influence of the atmosphere on the sun's rays. By the Royal Society of Edinburgh the Keith medal was thrice presented to him, and he filled the post of secretary to that body from 1840 till the failure of his health obliged him to resign it. In 1845 a pension of £200 a year was granted to him for his services rendered to science. He was fellow of the Royal Societies of London and Edinburgh, and of the Geological Society, corresponding member of the Imperial Institute of France, and associate or honorary member of the Bavarian Academy of Sciences, of the Academy of Palermo, of the Dutch Society of Sciences (Haarlem), of the Helvetic Society, of the Pontifical Society of the Pontifical Academy of "Nuovi Lincei" at Rome, and of the Natural History Societies of Heidelberg, Geneva, and Vaud, and honorary member of the Royal Medical Society of Edinburgh, of the Cambridge, Yorkshire, St. Andrews, and Isle of Wight Philosophical Societies, and of the Plymouth and Bristol Institutions.

A list of his scientific writings is to be found in the Royal Society *Catalogue*, but the following books may be mentioned as bearing more particularly on his glacier researches:—*Travels through the Alps of Savoy*, Black, Edin., 1843, 1845; *Norway and its Glaciers*, Black, Edin., 1853; *Occasional Papers on the Theory of Glaciers*, Black, Edin., 1859. See also *Théorie des Glaciers de la Savoie*, par M. le Chanoine Rendu (translated by Alfred Wills, edited by Professor George Forbes), Macmillan, Lond., 1874.

Forbes's Life and Letters, by Principal Shairp of St. Andrews, Prof. P. G. Tait, and A. Adams-Reilly, was published by Macmillan, London, 1873. (A. A. R.)

FORBES, Sir John (1787–1861), M.D., was born at Cuttlebrae, Banffshire. He attended the Grammar School at Aberdeen, and afterwards entered Marischal College. Having for nine years been assistant-surgeon and surgeon in the navy, he in 1817 graduated at Edinburgh, and then commenced practice in Penzance, whence he removed to Chichester. He took up his residence in London in 1840, and was the same year appointed Physician to the Prince Consort, and in 1841 physician to the Queen's household. He was a fellow of the Royal Society, and D.C.L. of Oxford; and in 1853 he received the honor of knighthood. He died November 13, 1861, at Whitchurch in Berkshire.

Sir John Forbes was better known as an author and editor than as a practical physician. His works include the following:—*Original Cases . . . illustrating the Use of the Stethoscope and Percussion in the Diagnosis of Diseases of the Chest*, 1824; *Illustrations of Modern Mesmerism*, 1845; *A Physician's Holiday*, 1st ed. 1849; *Memorandums made in Ireland in the Autumn of 1852*, 2 vols., 1853; *Sight-seeing in Germany and the Tyrol in the Autumn of 1855*, 1856. He was joint editor with Drs. Tweedie and Conolly of *The Cyclopædia of Practical Medicine*, 4 vols., 1833–35; and in 1836 he founded the *British and Foreign Medical Review*, which, after a period of prosperity, involved its editor in pecuniary loss, and ceased to exist, in consequence of the advocacy in its later numbers of doctrines obnoxious to the profession.

FORBIN, Claude de (1656–1733), French naval commander, was born in Provence, of a family of high standing, in 1656. High-spirited and ungovernable in his boyhood, he ran away from his home, and through the influence of an uncle entered the navy, serving his first campaign in 1675. For a short time he quitted the navy and entered the army, but soon returned to his first choice. He made under D'Estrées the American campaign, and under Duquesne that of Algiers in 1683, on all occasions distinguishing himself by his impetuous courage. The most remarkable episode of his life was his mission to Siam. During the administration of the Greek adventurer Faulcon in that country, the project was formed of introducing the Christian religion and European civilization, and the king sent an embassy to Louis XIV. In response a French embassy was sent out, Forbin accompanying the Chevalier de Chaumont with the rank of major. When Chaumont returned to France, Forbin was induced to remain in the service of the Siamese king, and accepted, though with much reluctance, the posts of grand admiral, general of all the king's armies, and governor of Bankok. His position, however, was soon made untenable by the jealousy and intrigues of the minister Faulcon; and at the end of two years he left Siam, reaching France in 1688. He was afterwards fully engaged in active service, first with Jean Bart in the war with England, when they were both captured and taken to Plymouth. They succeeded in making their escape, and were soon serving their country again. Forbin was wounded at the battle of La Hogue, and greatly distinguished himself at the battle of Lagos. He served under D'Estrées at the taking of Barcelona, was sent ambassador to Algiers, and in 1702 took a brilliant part in the Mediterranean in the war of the Spanish succession. In 1706 he took command of a squadron at Dunkirk, and captured many valuable prizes from the Dutch and the English. In 1708 he was entrusted with the command of the squadron which was to convey the Pretender to Scotland; but so effectually were the coasts guarded by Byng that the expedition failed and returned to Dunkirk. Forbin was now beginning to be weighed down with the infirmities of age and the toils of service, and in 1710 he retired to a country house near Marseilles. There he spent part of his time in writing his memoirs, published in 1730, which are full of interest and are written in a graphic and attractive style. Forbin died March 4, 1733.

FORCELLINI, Egidio (1688–1768), an Italian philologist, was born at Fener in the district of Treviso, and belonged to a very poor family. He went to the seminary at Padua in 1704, studied under Facciolati, and in due course attained to the priesthood. From 1724 to 1731 he held the office of rector of the seminary at Ceneda, and from 1731 to 1765 that of father confessor in the seminary of Padua. The remaining years of his life were mainly spent in his native village. He died at Padua in 1768 before the completion of the great work by which his name is preserved. This is a vast *Latin Lexicon*, usually referred to as Facciolati's, which has formed the basis of all similar works that have since been published. He was engaged with his Herculean task for nearly 35 years, and the transcription of the manuscript by Luigi Violato occupied eight years more. It was ultimately published at the expense of Cardinal Priole, under the title of *Totius Latinitatis Lexicon, consilio et cura Jacobi Facciolati, opera et studiis Ægidii Forcellini, Seminarii Patavini Alumni, lucubratum*, 4 vols., Padua, 1771.

FORCHHAMMER, Johan Georg, a Danish mineralogist and geologist, was born at Husum on July 26, 1794, and died at Copenhagen on December 14, 1865. After studying at Kiel and Copenhagen from 1815 to 1818, he joined Oersted and Esmarch in their mineralogical exploration of Bornholm, and took a considerable share in the labors of the expedition. In 1820 he obtained his doctor's degree by a chemical treatise *De Mangano*, and immediately after set out on a journey through England, Scotland, and the Faroe Islands. In 1823 he was named university lecturer on chemistry and mineralogy; in 1829 he obtained a similar post in the newly established polytechnic school; and in 1831 he was appointed professor of mineralogy in the university, and as such became curator of the geological museum. On the death of Oersted in 1851, he succeeded him as director of the polytechnic school and secretary of the academy of sciences. As a public instructor Forchhammer held a high place and contributed potently to the progress of his favorite studies in his native country. He delighted in the popularization of science, and frequently brought his knowledge and influence to bear on such practical questions as the introduction of gas into Copenhagen, the establishment of the fire-brigade at Rosenberg, or the boring of artesian wells.

Among his more important works are—*Lærebog i de enkelte Radicalers Chemi*, 1842; *Danmarks geognostiske Forhold*, 1835; *Om de Bornholmske Kulformationer*, 1836; *Dit nyere Kridt i Danmark*, 1847; *Bidrag til Skildringen af Danmarks geographiske Forhold*, 1858. A list of his contributions to scientific periodicals, Danish, English, and German, will be found in the *Catalogue of Scientific Papers* published by the Royal Society of London. One of the most interesting and most recent is "On the constitution of sea water at different depths and in different latitudes," in the *Proceedings of the Roy. Soc.*, xii., 1862–1863.

FORCHHEIM, a fortified town of Bavaria, circle of Upper Franconia, is situated near the junction of the Wiesent with the Regnitz, 16 miles S.S.E. of Bamberg. It has a castle, a collegiate and two other churches, a synagogue, a monastery, and a hospital. Its industries include brewing, tanning, soap-boiling, and glass manufacture. Forchheim is of very early origin. Charlemagne transplanted thither in 804 a number of Saxons from the Elbe, and made it an important commercial entrepôt. In the 9th and 10th centuries many assemblies, both of the princes and the kingdom were held at Forchheim, and in 890 a council of the church. In 1007 it was presented by the emperor Henry II. to the newly founded bishopric of Bemberg, but in 1040 Henry III. united it again to the kingdom. Henry IV., however, again presented it to the bishopric of Bemberg, with which it remained till 1802, when it came into the possession of Bavaria. In 1552 it was captured by the Margrave Albert of Brandenburg, and in 1634 besieged by Bernhard of Weimar. Its fortifications were restored in 1791. On the 6th and 7th August, 1796, a battle took place near it between the French and Austrians, when the French held possession of the field. Forchheim ceased to occupy the position of a fortified town after 1838. The population in 1875 numbered 3847.

FORD, John (1586–*c.* 1640), one of the most noteworthy writers of the English old drama in the period of its first decline, was born in 1586 at Ilsington in North Devon. He came of a good family; his father was in the commission of the peace, and his maternal grandfather, Sir John Popham, was successively attorney-general and lord chief justice. John Ford, like his cousin and namesake (to whom, with other members of the society of Gray's Inn, he dedicated his play of *The Lover's Melancholy*), entered the profession of the law, being admitted of the Middle Temple in 1602; but he seems never to have been called to the bar. Four years afterwards he made his first appearance as an author with an elegiac effusion called *Fame's Memorial, or the Earl of Devonshire deceased*, and dedicated to the widow of the earl (Charles Blount Lord Mountjoy, "coronized," to use Ford's expression, by King James in 1603 for his services in Ireland, which the elegy celebrates)—a lady who would have been no unfitting heroine for one of Ford's tragedies of lawless passion, the famous Penelope formerly Lady Rich. This panegyric, which is accompanied by a series of epitaphs, and is composed in a strain of fearless extravagance, was, as the author declares, written "unfee'd;" it shows Ford to have sympathized, as Shakespeare himself is supposed to have done, with the "awkward fate" of the countess's brother, the earl of Essex. Who the "flint-hearted Lycia" may be, to whom the poet seems to allude as his own disdainful mistress, is unknown; indeed, the record of Ford's private life is, like that of the lives of so many of our old dramatists, little better than a blank. To judge, however, from the dedications, prologues, and epilogues of his various plays, he seems to have enjoyed the patronage or goodwill of several men of rank—among them the excellent earl (afterwards duke) of Newcastle, "himself a muse" after a fashion, and the gallant Lord Craven, supposed to have been the husband of the ex-queen of Bohemia. Ford's tract of *Honor Triumphant, or the Peeres Challenge* (printed 1606), and the simultaneously published verses *The Monarches Meeting, or the King of Denmarkes welcome into England*, exhibit him as an occasional contributor to the festive demands of court and nobility; and a kind of moral essay by him, entitled *A Line of Life* (printed 1620), which contains a few not uninteresting references to Raleigh, ends with a climax of praise to the address of "a good man, of whom it may be verified that he is *bonorum maximus* and *magnorum optimus*"—viz., King James I. Yet it may be noted in passing that one of Ford's plays contains an implied protest against the absolute system of government which usually found ready acceptance with the dramatists of the early Stuart reigns.[1] Of our poet's relations with his brother-authors little is known; it was natural that he should exchange complimentary verses with Shirley, a more various though less intense dramatic poet of his own age and school, and that he should join in the chorus of laments with which the poets of the time mourned the decease of their acknowledged veteran chief, Ben Jonson. It is more interesting to notice an epigram in honor of the author of *Love's Sacrifice* and

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[1] *Crot.*—"The king hath spoke his mind.
Org.— "His will he hath;
But were it lawful to hold plea against
The power of greatness, not the reason, haply
Such undershrubs as subjects sometimes might
Borrow of nature justice, to inform
That license sovereignty holds without check
Over a meek obedience."
The Broken Heart, act iii. sc. 4.

The Broken Heart by a poet of a very different kind, but in whose genius it is not paradoxical to assert that there were points of contact with Ford's—Richard Crashaw, morbidly passionate in one direction as Ford was in another. Towards the public Ford seems, by reason either of his social position or of his personal character, to have assumed an attitude of independence; but for an assailant of the theatre, such as the author of *Histriomastix*, he displays, like his friend Shirley, a dramatist's inevitable scorn.

It has been concluded, from evidence of a rather vague description, that in the latter part of his life he gratified the tendency to seclusion for which he has been thought to be ridiculed in a contemporary poem, by withdrawing from business (it had probably been legal business of one kind or another), and from literary life in London, to his native place; but nothing is known as to the date of his death. His career as a dramatist very probably began with some plays in which he assisted, or was assisted by, other authors. The titles of these (all we possess of them) are not without significance. With Dekker he wrote *The Fairy Knight* and *The Bristowe Merchant;* with Webster *A Late Murther of the Sonne upon the Mother*. A play attributed to Ford alone, and entitled *An ill Beginning has a good End*, was brought on the stage as early as 1613; and in 1615 followed *Sir Thomas Overbury's Life and untimely Death*—a subject to which the poet devoted some lines, which are preserved, of indignant regret. He also wrote, at dates unknown, *The London Merchant* and *The Royal Combat;* a tragedy by him, *Beauty in a Trance*, was entered in the Stationers' Register in 1653, but never printed. Of the plays by Ford preserved to us the dates span little more than a decade—the earliest, *The Lover's Melancholy*, having been acted in 1628 and printed in 1629, the latest, *The Lady's Trial*, acted in 1638 and printed in 1639.

When writing *The Lover's Melancholy*, it would seem that Ford had not yet become fully aware of the bent of his own dramatic genius, although he was already master of his powers of poetic expression. We may suppose him, when he first became a dramatic author, to have been attracted towards both domestic tragedy and romantic comedy—to the former by an irresistible desire to sound the depths of abnormal conflicts between passion and circumstances, to the latter by a strong though not widely varied imaginative faculty, and by a self-delusion (such as will alone account for his repeated—and nearly always unsuccessful—efforts in this direction) that he was possessed of abundant comic humor. In his next two works, undoubtedly those most characteristically expressive of his peculiar strength, viz., *'Tis Pity she's a Whore* and *The Broken Heart* (both printed 1633), he had found themes the horrible situations in which required dramatic explanation by intensely powerful motives. Ford by no means stood alone among our dramatists in his love of abnormal subjects; but few were so capable of treating them sympathetically, and at the same time without that reckless grossness or extravagance of expression which renders the morally repulsive æsthetically intolerable, or converts the horrible into the grotesque. For in Ford's genius there was an element of true refinement, except when the self-delusion referred to came into play. In a third tragedy, *Love's Sacrifice* (also printed in 1633) he again worked on similar materials; but this time he unfortunately essayed to base the interest of his plot upon an unendurably unnatural possibility—doing homage to virtue after a fashion in which to honor is almost equivalent to insulting her. He might seem by this time to have been in danger of indulging still further a morbid tendency, the corroding influence of which is fatal to any genius abandoning itself to it; yet we find him in *Perkin Warbeck* (printed 1634) choosing an historical subject, and, alone among the dramatists of his age, seeking to emulate the glory of the great series of Shakespeare's national histories. It is true that his treatment of his theme, though neither unskilful nor unworthy, could not at once compass the breadth and variety which this species of drama demands. But the effort is one of the most commendable, as it was by no means one of the least successful, in the dramatic literature of this period; and we may unhesitatingly regret that he should not have made another essay in the same field, instead of turning to romantic comedy, for which he was without the requisite buoyancy of spirit, while all but devoid of the faintest vestige of comic humor. *The Fancies Chaste and Noble* (printed 1638), though it includes scenes of real force and feeling, is dramatically a failure, of which the main idea is almost provokingly slight and feeble; and *The Lady's Trial* (acted 1638, printed 1639) is only redeemed from utter wearisomeness by an unusually even pleasingness of form. There remain two other dramatic works, of very different kinds, in which Ford co-operated with other writers, the mask of *The Sun's Darling* (acted 1624, printed 1657), which is hardly to be placed in the first rank of early compositions, and *The Witch of Edmonton* (printed 1658, but probably acted about a quarter of a century earlier), in which we see Ford as a joint writer of one of the most powerful domestic dramas of our own or any other stage.

A few notes may be added on some of the more remarkable of the plays enumerated. A wholly baseless anecdote, condensed into a stinging epigram by Endymion Porter, asserted that *The Lover's Melancholy* was stolen by Ford from Shakespeare's papers. Lesser dramatists are in the habit of borrowing from greater; and there were few among the writers of our old drama, of whatever eminence or calibre, to whom plagiarism, whether in the matter of situations and characters, or of passages and expressions, would have seemed a literary liberty requiring defence. Undoubtedly, the madness of the hero of this play of Ford's occasionally recalls Hamlet, while the heroine is one of the many, and at the same time one of the most pleasing, parallels to Viola. But neither of them is a copy, as Friar Bonaventura in Ford's second play may be said to be a copy of Friar Lawrence, whose kindly pliability he disagreeably exaggerates, or as D'Avolos in *Love's Sacrifice* is clearly modelled on Iago. The plot of *The Lover's Melancholy*, which is ineffective because it leaves no room for suspense in the mind of the reader, seems original; in the dialogue, on the other hand, a justly famous passage in Act i. (the beautiful version of the story of the nightingale's death) is translated from Strada; while the scheme of the tedious interlude exhibiting the various forms of madness is avowedly taken, together with sundry comments, from that storehouse of useless learning, Burton's *Anatomy of Melancholy*. Already in this play Ford exhibits the singular force of his pathos; the despondent misery of the aged Meleander, and the sweetness of the last scene, in which his daughter comes back to him, alike go to the heart. A situation—hazardous in spite of its comic substratum—between Thaumasta and the pretended Parthenophil is conducted, as Gifford points out, with real delicacy; but the comic scenes are merely stagey, notwithstanding, or by reason of, the effort expended on them by the author.

'Tis Pity she's a Whore has been justly recognized as a tragedy of extraordinary power; but it seems no hard matter to join in this recognition, while reserving to one's self the right, which no canon of criticism can rebut, of protesting against the abuse of art of which this play furnishes an almost unparalleled example. Mr. Swinburne, in his eloquent essay on Ford, has rightly shown what is the meaning of this tragedy, and has at the same time indicated wherein consists its poison. He dwells with great force upon the different treatment applied by Ford to the characters of the two miserable lovers—brother and sister. "The sin once committed, there is no more wavering or flinching possible to him, who has fought so hard against the demoniac possession; while she who resigned body and soul to the tempter almost at a word, remains liable to the influences of religion and remorse." This different treatment shows the feeling of the poet—the feeling for which he seeks to evoke our inmost sympathy—to oscillate between the belief that an awful crime brings with it its awful punishment (and it is sickening to observe how the argument by which the Friar persuades Annabella to forsake her evil courses mainly appeals to the physical terrors of retribution), and the notion that there is something fatal, something irresistible, and therefore in a sense self-justified, in so dominant a passion. The key-note to the conduct of Giovanni lies in his words at the close of the first scene—

"All this I'll do, to free me from the rod
Of vengeance; *else I'll swear my fate 's my god.*"

Thus there is no solution of the conflict (which in one form or the other all men have to undergo) between passion on the one side, and law, duty, and religion on the other: and passion triumphs, in the dying words of "the student struck blind and mad by passion"—

"O, I bleed fast!
Death, thou'rt a guest long looked for; I embrace
Thee and thy wounds: O, my last minute comes!
Where'er I go, let me enjoy this grace
Freely to view my Annabella's face."

It has been observed by a recent critic of mark that "English poets have given us the right key to the Italian temperament. . . . The love of Giovanni and Annabella is rightly depicted as more imaginative than sensual." It is difficult to allow the appositeness of Mr. J. A. Symonds's special illustration; on the other hand, Ford has even in this case shown his art of depicting sensual passion without grossness of expression; for the exception in Annabella's language to Soranzo seems to have a special intention, and is true to the pressure of the situation and the revulsion produced by it in a naturally weak and yielding mind. The entire atmosphere, so to speak, of the play is stifling, and is not rendered less so by the underplot with Hippolita.

Like this tragedy, *The Broken Heart* was probably founded upon some Italian or other novel of the day; but since in the latter instance there is nothing revolting in the main idea of the subject, the play commends itself as the most enjoyable, while, in respect of many excellences, an unsurpassed specimen of Ford's dramatic genius. The complicated plot is constructed with greater skill than is usual with this dramatist, and the pathos of particular situations, and of the entire character of Penthea—a woman doomed to hopeless misery, but capable of seeking to obtain for her brother a happiness which his cruelty has condemned her to forego—has an intensity and a depth which are all Ford's own. Even the lesser characters are more pleasing than usual, and some beautiful lyrics are interspersed in the play.

Of the other plays written by Ford alone, *The Chronicle Historie of Perkin Warbeck—A Strange Truth* alone appears to call for special attention. A repeated perusal of this drama suggests the judgment that it is overpraised when ranked at no great distance from Shakespeare's national dramas. Historical truth has not to be taken into consideration in the matter; and if (notwithstanding Mr. Gairdner) there are still credulous persons left to think and assert that Perkin was not an impostor, they will derive little satisfaction from Ford's play, which with really surprising skill avoids the slightest indication as to the poet's own belief on the subject. That this tragedy should have been reprinted in 1714 and acted in 1745 only shows that the public, as is often the case, had an eye to the catastrophe rather than to the development of the action. The dramatic capabilities of the subject are, however, great, and it afterwards attracted Schiller, who, however, seems to have abandoned it in favor of the similar theme of the Russian Demetrius. Had Shakespeare treated it, he would hardly have contented himself with investing the hero with the nobility given by Ford to this personage of his play,—for it is hardly possible to speak of a personage as a *character* when the clue to his conduct is intentionally withheld. Nor could Shakespeare have failed to bring out with greater variety and distinctness the dramatic features in Henry VII., whom Ford depicts with sufficient distinctness to give some degree of individuality to the figure, but still with a tenderness of touch which would have been much to the credit of the dramatist's skill had he been writing in the Tudor age. The play is, however, founded on Bacon's *Life*, of which the text is used by Ford with admirable discretion. The minor characters of the honest old Huntley, whom the Scottish king obliges to bestow his daughter's hand upon Warbeck, and of her lover the faithful "Dalyell," are most effectively drawn; even "the men of judgment," the adventurers who surround the chief adventurer, are spirited sketches, and the Irishman among them has actually some humor; while the style of the play is, as befits a "Chronicle History," so clear and straightforward as to make it easy as well as interesting to read.

The Witch of Edmonton was attributed by its publisher to William Rowley, Dekker, Ford, "etc.," but the body of the play has been generally held to be ascribable to Ford and Dekker only. Mr. Swinburne agrees with Gifford in thinking Ford the author of the whole of the first act; and he is most assuredly right in considering that "there is no more admirable exposition of a play on the English stage." Supposing Dekker to be chiefly responsible for the scenes dealing with the unfortunate old woman whom persecution as a witch actually drives to become one, and Ford for the domestic tragedy of the bigamist murderer, it cannot be denied that both divisions of the subject are effectively treated, while the more important part of the task fell to the share of Ford. Yet it may be doubted whether any such division can be safely assumed; and it may suffice to repeat that no domestic tragedy has ever taught with more effective simplicity and thrilling truthfulness the homely double lesson of the folly of selfishness and the mad rashness of crime. To us such plays as this are singularly interesting, both as pictures of the manners of the age which they depict without the effort more or less perceptible in comedy, and as illustrations of a species of the modern drama which, in its best examples, is perhaps of all the least liable to essential change.

With Dekker, Ford also wrote the mask of *The Sun's Darling*; or, as seems most probable, they founded this production upon *Phaeton*, an earlier mask, of which Dekker had been sole author. Gifford holds that Dekker's hand is perpetually traceable in the first three acts of *The Sun's Darling*, and through the whole of its comic part, but that the last two acts are mainly Ford's. If so, he is the author of the rather forced occasional tribute on the accession of King Charles I., of which the last act largely consists. This mask, which furnished abundant opportunities for the decorators, musicians, and dancers, in showing forth how the seasons and their delights are successively exhausted by a "wanton darling," Raybright the grandchild of the Sun, is said to have been very popular. It is at the same time commonplace enough in conception; but there is much that is charming in the descriptions, Jonson and Lyly being respectively laid under contribution in the course of the dialogue, and in one of the incidental lyrics.

Ford holds a position of his own among our dramatists of the second order. This he owes not to his skill as a constructor of plots, which he at times prepares better than he executes them, thus verifying the observation that the supreme skill of the dramatist lies, not in devising or finding the chief situation of his play, but in the harmonious building-up of the action and development of the characters towards it. Nor does he owe it even to the beauty of his versification, the fluency and strength of which are incontestable, notwithstanding a certain obscurity of style. His peculiar power lies in the intensity of his passion, in particular scenes and passages where the character, the author, and the reader are alike lost in the situation and in the sentiment evoked by it; and this gift is a supreme dramatic gift. But his plays—with the exception of *The Witch of Edmonton*, in which he doubtless had a prominent share—too often disturb the mind like a bad dream which ends as an unsolved dissonance; and this defect is a supreme dramatic defect. It is not the rigid or the stolid who have the most reason to complain of the insufficiency of tragic poetry such as Ford's; nor is it that morality only which, as Ithocles says in *The Broken Heart*, "is formed of books and school-traditions," which has a right to protest against the final effect of the most powerful creations of his genius. There is a morality which both

> "Keeps the soul in tune,
> At whose sweet music all our actions dance,"

and is able to physic

> "The sickness of a mind
> Broken with griefs."

Of that morality—or of that deference to the binding power within man and the ruling power above him—tragedy is the truest expounder, even when it illustrates by contrasts; but the tragic poet who merely places the problem before us, and bids us stand aghast with him at its cruelty, is not to be reckoned among the great masters of a divine art.

The best edition of Ford is that by Gifford, with notes and introduction, revised with additions to both text and notes by the late Mr. Dyce (3 vols. 1869). Mr. Swinburne's "Essay on Ford," to which reference has been made in this article, is reprinted among his *Essays and Studies* (1875). (A. W. W.)

FORD, RICHARD (1796–1858), author of one of the earliest and best of travellers' *Handbooks*, was the eldest son of Sir Richard Ford, who in 1789 was member of parliament for East Grinstead, and for many years afterwards chief police magistrate of London. His mother was the daughter and heiress of Benjamin Booth, who was a distinguished connoisseur in art, and from whom his grandson seemed to have inherited the artistic skill and taste which he developed to so high a pitch of excellence in his writings, his sketches, and his collections from Continental countries, particularly Spain. He was educated at Winchester, graduated at Trinity College, Oxford, and was called to the bar in Lincoln's Inn. Ford, however, never practised the profession of a lawyer, and in 1830 he landed for the first time in Spain, where he travelled for three years, spending much of his time in the Alhambra, and at Seville. On his return to England in 1833, he settled in Devonshire at Heavitree, near Exeter, where, writes his friend, the late Sir William Stirling Maxwell, "he built himself a charming residence, and surrounded it with gardens and terraces, which he adorned with graceful Moorish buildings, and planted with pines and cypresses from historic groves by the Xenil and Guadalquiver." From 1837 to 1857 he contributed to the *Quarterly Review*, his first contribution to that periodical being a paper on the apparently uninviting subject of Devonshire cob walls, and his last a review of *Tom Brown's School Days*. His first work was the pamphlet, *An Historical Inquiry into the Unchangeable Character of a War in Spain* (Murray, 1837), in reply to one called the *Policy of England towards Spain*, and issued under the patronage of Lord Palmerston. He spent the winter of 1839–40 in Italy, where he added largely to his collection of majolica; and soon after his return he began, at Mr. Murray's invitation, to write his *Handbook for Travellers in Spain*, the literary work with which his name is chiefly associated. In consequence of the failure of his health, he was obliged to resign his seat on a royal commission that had been appointed, in the winter of 1856–57, to report on the best site for the National Gallery, and he died on the 31st August, 1858.

FORD, THOMAS, an English musician, of whose life little more is known than that he was attached to the court of Prince Henry, son of James I. His works also are few, but they are sufficient to show the high stage of efficiency and musical knowledge which the English school had attained at the beginning of the 17th century. They consist of canons and other concerted pieces of vocal music, mostly with lute accompaniment. The chief collection of his works is entitled *Musike of Sundrie Kinds set forth in Two Books*, etc., 1607, and the histories of music by Burney and Hawkins give specimens of his art. Together with Dowland, immortalized in one of Shakespeare's sonnets, Ford is the chief representative of the school which preceded Henry Lawes, the great master of declamatory music, who, according to Milton,

> "First taught our English music how to span
> Words with just note and accent."

In this art, however, Ford is by no means deficient, his songs showing great care in the exact rendering of the words, with regard to both accent and meaning.

FORDUN, JOHN OF. Little is known with any certainty of this chronicler, and the so-called lives of him are mainly a collection of conjectures more or less probable. The credulity of our early writers is pardonable; the nonsense of some later ones is without excuse. A notice inserted in the *New Statistical Account* of the parish of Fordoun in Kincardineshire begins thus:—"John of Fordun, the historian, was either a native of the parish or resident in it, when he wrote his history of Scotland. He is called by Bede 'venerabilis vir Dominus Joannes Fordun, Presbyter.'" The writer's notions of chronology must have been somewhat peculiar. The statement generally made that the chronicler was born at Fordoun has apparently no better foundation than his name. It is certain that he was a secular priest, and that he composed his history in the latter part of the 14th century; and it is probable that he was a chaplain in the cathedral of Aberdeen. The work of Fordun is the earliest attempt to write a continuous history of Scotland; nothing existed previously except brief chronicles and genealogical memoranda. It is divided into five books. The first three are almost entirely fabulous, and form the groundwork on which Boece and Buchanan afterwards raised the huge structure of historical and political fiction, which was first exposed by Thomas Innes in his *Critical Essay*. The 4th and 5th books, though still mixed with fable, contain much valuable information, and become more authentic the more nearly they approach the author's own time. The 5th book concludes with the death of King David I. in 1153. Besides these five books, Fordun wrote part of another book, and collected materials for bringing down the history to a later period. These materials were used by a continuator who wrote in the middle of the 15th century, and who is commonly, and no doubt correctly, identified with Walter Bower, abbot of the monastery of Inchcolm. The additions of Bower form eleven books, and bring down the narrative to the death of King James I. in 1437. According to the custom of the time, the continuator did not hesitate to interpolate Fordun's portion of the work with additions of his own, and the whole history thus compiled is known as the *Scotichronicon*. The first printed edition of Fordun's work was that of Thomas Gale in his *Scriptores Quindecim*, which was published in 1691. This was followed by Thomas Hearne's edition in 1722. The whole work, including Bower's continuation, was published by Walter Goodall at Edinburgh in 1759. In 1871 and 1872 Fordun's chronicle, in the original Latin and also in an English translation, was edited by Mr. William F. Skene in the series of *The Historians of Scotland*. Mr. Skene's preface to this valuable edition contains full information both in regard to the author, the manuscripts of his work, and the printed editions. Reference may also be made to Thomas Innes's *Critical Essay*, vol. i. pp. 201–214; to the biographical notice of Fordun in the second volume of *Tytler's Lives of Scottish Worthies*; and to Mr. Felix G. H. Skene's preface to the "Liber Pluscardensis," in the series of *The Historians of Scotland*.

FORESTS, FOREST ADMINISTRATION. A forest is a tract of country covered with trees, of one or several species, or with trees and underwood. Forests are of the greatest importance in the general economy of the globe influencing the humidity of the air and the soil, mitigating the extremes of heat and cold, affording shelter to man and beast, and enriching the soil on which they grow. Trees supply timber and fuel to man, and furnish him with a vast variety of economical products, such as gums, drugs, dyes, and articles of food. The management of large areas of natural or planted wood-lands is called Forestry or Sylviculture. For the culture and uses of individual trees, see the separate articles, such as BIRCH, ELM, FIR, OAK, etc.; and for ornamental belts, avenues, etc., the reader is referred to ARBORICULTURE.

Historical records give us reason to believe that the habitable earth was generally covered with forest growth before it became the abode of man, and additional proof of this is found in the extensive remains of ancient trees. The geological record may also be referred to, as evidencing by its coal-fields the extensive breadths once covered by the richest vegetation.

The arboreous vegetation of the earth is remarkable for its great variety; many countries are rich in pines, others in oaks; Australia in Eucalyptus or gum trees, India in teak, California in Wellingtonia or Sequoia, and Brazil in palms. Trees, like other plants, require different degrees of heat, light, moisture, and elevation above the sea for their vigorous development, and hence various countries have their characteristic forests. The birches and pines of the North make way in the temperate zone for oaks and beeches, and in the tropics for palms and other heat-loving trees. The same trees seem to require similar climates, but the same climates do not always produce the same plants. The mountains of South India and Ceylon closely resemble the regions where the cinchona forests occur, but the genus is wanting in Asia. Again the teak is unknown in America, although parts of Brazil resemble its home in Malabar. These anomalies are explained perhaps mainly by the primitive distribution of the plants (see DISTRIBUTION). It is also remarkable that some forests consist solely of one particular tree (on the Continent technically called "pure forest," in contradistinction to mixed forests), such as the birch in Lapland, the deodar in the Himalaya, the *Abies canadensis* and *Pinus Strobus* in North America. The European forests, on the contrary, are generally composed of coniferous trees mingled with oak, elm, ash, beech, poplar, willow, alder, birch, and lime, interspersed with hornbeam, and various species of *Pyrus* and *Prunus*, the underwood being hazel, elder, buckthorn, viburnum, roses, etc. The American forests contain a still greater variety of species, a fact strikingly illustrated by Sir J. D. Hooker, in speaking of a patch of native forest a few miles from St. Louis on the Missouri:—"In little more than half an hour, and less than a mile's walk, I saw forty kinds of timber trees, including eleven of oak, two of maple, two of elm, three of ash, two of walnut, six of hickory, three of willow, and one each of plane, lime, hornbeam, hop-hornbeam, laurus, diospyros, poplar, birch, mulberry, and horse-chestnut, together with about half that number of shrubs."

Natural forests may be divided into several classes, and in Kurz's forest flora of British Burmah the classification adopted is as follows:—

Evergreen Forests.

1. Littoral Forests.
2. Swamp Forests.
3. Tropical Forests.
4. Hill Forests.

Deciduous or Leaf-Shedding Forests.

5. Open Forests.
6. Dry Forests.
7. Mixed Forests.
8. Dune Forests.

The following table, calculated by Rentzsch (*Der Wald*), from statistics obtained prior to 1862, shows the proportion of woodland in different European countries, as estimated at that date:—

Norway	66·00 per cent.	Sardinia	12·29 per cent.
Sweden	60·00 "	Neapolitan States	9·43 "
Russia	30·90 "	Holland	7·10 "
Germany	26 58 "	Spain	5·52 "
Belgium	18·52 "	Denmark	5·50 "
France	16·79 "	Great Britain	5·00 "
Switzerland	15·00 "	Portugal	4·40 ".

Siemoni gave in 1872 the proportion in Turkey at 24 per cent., and in United Italy 8·70 per cent.

For comparison, we quote from the most recent official abstract the Population, Area, and Acreage under Wood in the United Kingdom and various foreign countries, according to returns furnished by the agricultural and statistical departments of the respective countries.

	Population.	Area (in English Acres).	Woods and Forests (in Acres).	Proportion of Woodland.
Great Britain (1877).......	26,072,284	55,802,360[1]	2,187,078	3·92
Ireland (1877)..............	5,412,377	20,327,196[1]	328,413	1·62
United Kingdom, including Isle of Man and Channel Islands (1877).............	31,629,299	76,323,203[1]	2,515,491	3·29
Russia in Europe (1872).	71,730,980	1,244,367,351[2]	527,426,510	42·38
Sweden (1875)	4.383,291	100,514.956[1]	40,636,883	40·43
Norway (1870)...............	1,742,000	77,527,766[1]	17,290,000	22·30
Denmark (1876)	1,784,741	8,572,929[1]	364,474	4·25
Prussia (1876)	24,643,623	85,834.703[1]	20,047,014	23·35
Baden (1876)..................	1,507,179	3,726,080[3]	1,337,767	35·90
Würtemberg (1876)........	1.881,503	4,786,114[1]	1,494,147	31·22
Holland (1875)................	3.865,456	7,761.528[1]	486,229	6·27
Belgium (1866)	4,827,833	7,241,000[1]	1,073,452	14·82
France (1874).................	36,102,921	130,675,286[4]	20,641.953	15·79
Italy (1874)...................	26,801,154	73.187,335[4]	9,031,310	12·34
Austria Proper (1875)....	20,394,980	74,176.000	23,284,174	31·39
Hungary (1875).............	13,561,245	68,799.000[1]	19,425.600	28·24
Switzerland (1877).........	2,669,147	10,223,281[4]	1,905,407	18·64
United States (1875).......	38,558,871	2,095,600,000[4]	...	...

[1] Exclusive of lakes and rivers. [2] Exclusive of lakes.
[3] Exclusive of the Bodensee. [4] Inclusive of lakes and rivers.

Russia..................	42·38	per cent.	Switzerland........	18·64	per cent.
Sweden.................	40·43	"	France.................	15·79	"
Baden	35·90	"	Belgium	14·82	"
Würtemberg	31·22	"	Italy..........	12·34	"
Austria.................	31·39	"	Holland.............	6·27	"
Hungary.............	28·24	"	Denmark............	4·25	"
Prussia................	23·35	"	Great Britain......	3·29	"
Norway..............	22·30	"			

The discrepancies observable in these tables are in some cases apparent; thus the latest returns from Russia, Sweden, Norway, etc., are exclusive of sheets of water, whereas in the same returns the area of France, Italy, and Switzerland includes the lakes and rivers. Great Britain also now includes the Isle of Man and Channel Islands. In other cases the discrepancies are real, arising from the greater accuracy of information which has been collected through Government organizations, which did not exist when the estimate of Rentzsch was made. An entire comparison is unattainable, but it will be observed that the largest proportion of woodland is in Russia, Sweden, Germany, and Austria. The lowest occurs in Britain, Denmark, Holland, Spain, and Portugal.

The physical history of every country proves incontestably that a moderate extent of forest promotes in a high degree both its agricultural and its manufacturing interests, as well as the productive resources of the country at large; and the beneficial influence of forests in a physical, economical, and hygienic aspect is now receiving more of the attention its importance deserves. The countries bordering the Mediterranean—Spain, France, Italy, and Turkey—have all suffered in a marked degree from the reckless and wholesale destruction of the woods which covered the mountain slopes, and many springs which formerly existed under the shelter of the forest have now wholly disappeared. Though the insular position and moist climate of the British Isles save them from suffering from the want of forest in an equal degree with Continental nations, the Anglo-Saxon race has been slow to apprehend the value of the forests with which nature has so liberally clothed the earth, and the history of North America, South Africa, Australia, and New Zealand bears testimony to the same improvidence and need of consideration. There can be no doubt that one of the causes of the terrible famines in India and China is the unwise denudation of mountain slopes, where the forests formerly absorbed a large portion of the rainfall which now quickly runs off to the sea (see CLIMATE). No point has been more clearly established than the salubrious and fertilizing effect of forest clothing in the climate of India. It has been the subject of much inquiry, and has been affirmed and demonstrated in reports from many districts.

We propose in this article to indicate briefly the principal wooded tracts of the earth, so far as known, and to describe the systems of conservancy adopted or the preliminary measures taken for the better management of state forests. Timber trees and forest produce will be briefly enumerated, but for the distinctive flora the reader is referred to the separate article on each country.

Forest science constitutes a separate branch of education in various countries of Europe. The first technical instruction was given in the Hartz forest, and Germany has taken the lead in developing a wise forest administration. France, Italy, Sweden, and Russia have successively established forest academies, and now the conservation of woodland occupies the legislature of almost all civilized lands.

The general systems of forest management in Britain and on the Continent are essentially different. Beautiful enclosures and plantations are seen in almost every part of England and Scotland. With the exception, however, of coppice wood and a limited extent of natural forest in the Highlands of Scotland, the system generally followed is to cut down the mature crop and to plant again. But on the Continent natural reproduction is the rule, not of wood coppice only, but also of high forest. In France the term of maturity for cutting a forest is determined with great care by a committee of skilled officers, and is usually divided into periods of so many years each; the term for an oak forest, for example, say 150 years, is divided into five periods of thirty years. Each series of years represents so many blocks or portions of forest, and the yearly cuttings are arranged so as to cover a certain extent of ground, and when one block has been felled another reaches maturity. France has a state department for the administration of the forests, and a very detailed code of forest laws (*Code Forestier*). The relation of woods to the regular drainage of the soil, and especially to the permanence of the configuration of the terrestrial surface, has been thoroughly investigated. The methods of resisting the encroachment of sands or dunes have also received special attention. In Germany forestry is eagerly followed as a profession, and forest academies are numerous and well organized. The examination of candidates is very strict, and the result of the system has been most beneficial. In forest science Germany is far advanced, and the literature is specially rich. Every tract is carefully surveyed and treated on a working plan made with great exactness as to actual details and expected growth; care is always taken that in high forest there is a good stock of self-sown trees before the old crop is entirely removed. Systematic observation and experiments are made as to the rate of growth, and the best soil for each description of tree.

In Italy, where the French and German systems have been tested, the principles of sylviculture adopted by Hartig, Cotta, etc., are not always applicable in the drier climate of the south. On the arid slopes of the Apennines pasture is more profitable, and there is as yet little sympathy with skilled conservation of woods.

EUROPE.

Great Britain and Ireland.—The British Isles were formerly much more extensively wooded than at present. The rapid increase of population has led to the disafforesting of woodland; the climate requires the maintenance of household fires during a great part of the year, and there has been an increasing demand for arable land; these along with the extension of manufacturing industries have been the chief causes of the diminution of wood. The proportion of forest is now very small, and yields but a fraction of the required annual supply of timber, which is imported with facility from America, northern Europe, and the numerous British colonies.

Owing to the nature of the climate of the British Islands, with its abundance of atmospheric moisture and freedom from such extremes of heat and cold as are prevalent in continental Europe, a great variety of trees are successfully cultivated. In England and Ireland oak and beech are on the whole the most plentiful trees in the low and fertile parts; in the south of Scotland the beech and ash are perhaps most common, while the Scotch fir and birch are characteristic of the arboreous vegetation in the Highlands. Although few extensive forests now exist, woods of small area, belts of planting, clumps of trees, coppice, and hedgerows are generally distributed over the country, constituting a mass of wood of considerable importance, giving a clothed appearance in many parts, and affording illustrations of skilled arboriculture not to be found in any other country.

The principal state forests in England are Windsor Park, 14,000 acres, the New Forest, etc., in Hampshire, 76,000 acres, and the Dean Forest in Gloucestershire, 22,500 acres. The total extent of crown forests is about 125,000 acres, and the timber growing upon them is valued at between two and three millions of pounds. A large proportion of the crown forests, having been formed with the object of supplying timber for the navy, consists of fine oak. These wooded tracts are under careful management. The total receipts from the royal forests exclusive of Windsor amounted in 1876–77 to £33,129. The largest forests in Scotland are in Perthshire, Inverness-shire, and Aberdeenshire. Of these the most notable are the earl of Mansfield's near Scone (8000 acres), the duke of Atholl's larch plantations near Dunkeld (10,000 acres), and in Strathspey a large extent of Scotch fir, partly native, partly planted, belonging to the earl of Seafield. The last-named forest has been regularly planted in such a gradation as to cut 1000 acres annually on a rotation of sixty years. In the forests of Mar and Invercauld, the native pine attains a very great size, and there are also large tracts of indigenous birch in various districts. The total area under wood in Scotland is less than it was in 1812 by 200,000 acres. Ireland was at one time richly clothed with wood; this is proved by the abundant remains of fallen trees in the bogs which still occupy a large surface of the island. In addition to the causes above alluded to as tending to disafforest England, the long unsettled state of the country also conduced to the diminishing of the woodlands. At present indigenous timber is exceedingly scarce, the proportion of woodland being only 1·62. The abundance of peat compensates in some measure for the want of wood as fuel.

The following acreages of land and woodland in the United Kingdom are taken from the agricultural returns of 1877:—

	Total Area, including Water.	Woods, Coppices, and Plantations.
England	32,597,398	1,325,765
Wales	4,721,823	126,823
Scotland	19,496,132	734,490
Ireland	20,819,829	325,173
	77,635,182	2,512,251

In England, the woods, except the crown forests, being generally on a small scale and private property, there has been no legislative interference with their management. No uniform system of education has been adopted, and a school of forestry is much required. Meanwhile the Highland and Agricultural Society of Scotland grants certificates for proficiency in the theory and practice of forestry tested by examination. Excellent instruction in surveying, botany, chemistry, geology, and collateral subjects is given in Edinburgh, at the Royal Agricultural College, Cirencester, at Glasnevin, Dublin, and in other places.

Norway and Sweden.—The peninsula formed by the kingdoms of Norway and Sweden is abundantly wooded. The principal trees are Scotch fir (*Pinus sylvestris*), spruce fir (*Abies excelsa*), and birch (*Betula alba*). These grow to a large size, and the birch extends almost as far as the North Cape, only giving place at high altitudes to low bushy willows. In the southern districts only is there any variety of hard wood. The forests are principally situated in the east of Norway. The western parts have been denuded, and the wants of the sea-coast are supplied from the inland districts.

Of the vast area of waste land returned as forest in Norway, about one-ninth belongs to the state or to various state institutions. In the greater part of the forests the population have a long established right for grazing, timber, and firewood; and even in tracts in which landowners or the state have a part ownership, the rights of the population, if they have any, take precedence of all other claims. Communal forests are managed by men chosen from among those who jointly own them. From the 16th century various laws attempted to regulate the private forests, but these were found vexatious, and were repealed in 1836. The forest department for the control of state forests consists of 27 officers, with a very large staff of men employed in felling and timber transport. The export of timber from Norway is chiefly from the Skeen Fiord, and the various ports between Cape Lindesnaes and the Swedish border. The annual export amounts to about 80,000,000 cubic feet, more than half being sent to Great Britain and Ireland, while the average annual value is estimated at £2,400,000. Some idea of the great timber resources of Norway may also be gathered from the fact that in the census of 1865 there were 4937 men entered as working in the forests, and 17,549 described themselves as employed in woodwork, saw-mills, tar-preparing, etc. In a Norwegian administration report it is stated that "the present destruction of forests has reached the limit of the permissible, probably even exceeded it."

Of the 100,500,000 acres in the kingdom of Sweden, 88,800,000 were officially reported in 1875 as forest waste land, 12 millions being public, and 76 millions private property. Only about half of this, however, is really covered with wood, including plantations formed in recent years. Of the public forests only 4 million acres are under direct state management; about an equal area remains to be demarcated, while the rest belongs to other public institutions, is attached to state residences, or is temporarily alienated. The trees in Sweden are the same as those of Norway, but oak, elm, lime, alder, and beech grow more extensively in the south. Birch-wood is chiefly used as fuel, and the wood of the aspen is largely employed in the manufacture of matches.

Forest management in Sweden is in course of progressive development, and the administration is conducted with energy. The department consists of a director and 700 men of different administrative and executive grades. Much labor is required to bring the timber to market from remote forests in the western part of the kingdom; in winter sledges on ice and snow are used for transport, and in floating down the rivers logs often take four and five years to reach the timber dépôt. Besides the control of the state and other public forests, the department is entrusted with the surveillance of private forests.

In 1875 the total revenue of the state forests was £56,807. The actual expenditure was £35,787. The profits were therefore £21,020. The shipments of timber are annually increasing, and were in 1874 325,061 loads, and 704,741 standards. A Government forest school at Stockholm, which in 1875 had 13 students, supplies recruits for the higher grades of forest service, while there are six provincial schools for training men for the subordinate posts. Besides these, there is a private forest school receiving a grant in aid from Government.

Denmark is one of the most poorly wooded countries in Europe, the percentage of woodland being now only 4·25 of the whole area. This small proportion is caused chiefly by the nakedness of the western part of Jutland, where the west winds have seconded the action of man in destroying the forests. Much of the wood which at one time covered nearly the whole of Denmark having been cut down, to make way for agriculture, and to supply fuel and timber, a vast area thus bared has become a sandy heathy desert. The chief indigenous trees of Denmark are the spruce and Scotch fir, birch, and aspen. The oak also forms valuable forests on the islands of Falster and Lolland. Beech, which was later introduced, has flourished so well as almost to monopolize the forest ground, and special protection is afforded to the oak, while a variety of conifers are being introduced as rivals to the beech; in a few places only, such as Normandy and the Carpathian mountains, are beech forests so luxuriant as in Denmark. Although laws to check the destruction of forests were enacted in the 15th, 16th, and 17th centuries, they were treated as a dead letter; it is only since 1805 that effective measures have been taken to preserve the remains of Danish woodland and to create new plantations. A State forest department permits only small portions of old forests to be cleared at a time, and insists on the simultaneous planting of an equal area. The department also exercises a controlling supervision on private forests, forming plantations where necessary on private estates at the expense of the owner. About one-fifth of the entire area of Denmark may be described as lying waste; some of this is unfit for the growth of trees, but already extensive plantations have been formed, on the heaths and dunes of West Jutland, of hardy trees such as *Pinus montana*, *Abies alba*, *A. excelsa*, and *A. pectinata*. In some instances, the State purchases tracts of heath on which to form plantations, and in others grants aid to private enterprise.

The Danish forest school is at Copenhagen, and forms a branch of an agricultural college. Admittance is obtained after passing an examination similar to that required for matriculation at the university. The forest education requires four examinations, and the subjects comprised are—(1) mathematics, geology, natural philosophy, chemistry, zoology, botany, and drawing; (2) practical work, to acquire a knowledge of which the student generally arranges to serve for a year or two under a forest officer; (3) an oral examination in the principles of forestry, surveying, geology, hydrology, forest zoology, and botany; and (4) these principles applied practically, a tract of forest above 200 acres to be surveyed, and levels found for a line of 3000 or 4000 feet. The course of study extends from four to six years; the student then becomes a "forest candidate," and may look for Government employment.

Holland, on account of its formation and climate, possesses no indigenous forests. The country is so intersected by water that it is extremely subject to fogs, and being little above the sea level it is greatly exposed to winds, those from the north-west especially being prejudicial to tree growth, while the marshy ground prevents the roots from penetrating far into the soil. There is, however, along the roads and embankments, a considerable amount of timber, consisting of beech, poplar, willow, and ash, which attain a large size, and in the management of such avenues the Dutch excel. Elms also thrive on the embankments. The extensive dunes, amounting to 140,000 acres, are planted chiefly with hardy conifers (Marsh).

Belgium.—The physical features of Belgium are, except in the northern part, very different from those of Holland. The chief forests are in the districts of Brabant and Flanders, and the old forest of Ardennes still extends along the south-eastern frontier. According to Siemoni, in 1872 Belgium had 18 per cent. of her soil covered with wood. Recent returns give the area of state forest in Belgium as nearly 75,000 acres, and of communal forests 300,000 acres, all being under Government control.

Germany is in general well wooded, the forests of Prussia being estimated to cover 23·35 per cent. of the whole surface; while Würtemberg has 31·22, and Baden 35·90. This wealth is partly due to the abundant natural supply, and partly to the methodical way of treating forests adopted by all the states of the empire. The winters being long and severe, an abundant supply of fuel is almost as essential as a sufficient supply of food. This necessity has led, in the absence of coal, and along with a passion for the chase, to the preservation of forests, and to the establishment of an admirable system of forest cultivation, almost as carefully conducted as field tillage. We need only enumerate a few of the principal wooded tracts bordering on the Rhine and the Elbe. The Black Forest stretches the whole length of the grand-duchy of Baden and part of the kingdom of Würtemberg, from the Neckar to Basel and the lake of Constance. The vegetation resembles that of the Vosges; forests of spruce, Scotch, and silver firs, mingled with birches, beech, and oak, are the chief woods met with. The forest of Rippoldsau, on the head waters of the Kinzig, is one of the best forests, and is managed with great care. In the grand-duchy of Hesse, the Odenwald range of mountains, stretching between the Maine and the Neckar, contains the chief supply of timber. These two large tracts of forest are favorably situated with respect to water carriage, and from them the supply of timber for exportation is mainly drawn; it is now, however, so much diminished in passing down the Rhine through populous districts, that it no longer suffices for the demands of the Dutch shipbuilders. The largest spars are called "Holländer." The floating operations down the several tributaries of the Rhine in the Black Forest are very instructive, and the timber trade may there be studied with advantage. In the duchy of Nassau there are the large wooded tracts of the Westerwald and the Taunus mountain ranges, and the forests cover a large area extending between Neuwied and Bieberich. In Rhenish Prussia the valuable forests nearly equal the arable land in extent. These lie partly in the Ardennes, on the borders of Belgium, and on the mountains overhanging the Upper Moselle, but they do not furnish such stately trees as the Schwarzwald or Black Forest and the Odenwald. The Vosges forests were ceded to Germany in 1872, after the Franco-Prussian war. The Spessartwald, near Aschaffenburg-on-the-Maine in Bavaria, is one of the most extensive forests of middle Germany, containing large masses of fine oak with extensive plantations of coniferous trees, spruce, Scotch fir, and larch. Bavaria possesses other fine forest tracts, such as the Baierischewald on the Bohemian frontier, the Kranzberg near Munich, and the Frankewald in the north of the kingdom. North Germany has extensive forests on the Hartz and Thuringian mountains, while in East Prussia large tracts of flat ground are covered with *Pinus sylvestris*, *Abies excelsa*, and juniper.

Prussia, including Hanover, contains about 20 million acres of forest land. About half of this is private property, and of the other half, managed by the state, part is communal or ecclesiastical forest. Of the state forests, equalling 6,200,000 acres, a small proportion is moorland yet to be planted. The yield of the state woodland in 1871, a large portion of which bears Scotch fir, was 204,796,260 cubic feet, or 34·5 cubic feet per acre of the area devoted to the produce of timber. The total income for the year for timber and other forest products amounted to £2,100,000, or about six shillings an acre, little more than half of which went to working expenses, the cost of the forest academies, commutation of servitudes, and road taxes.

Much has been done in Germany to preserve and develop the forest resources by establishing training schools, with the result that sylviculture has been most accurately studied, and the economical management of woodland most successfully carried out in that country. The following eight academies existed prior to the unification of the empire. Each large state had one school. They are now being remodelled with a central office at Berlin.

Eisenach in Thuringia, Saxe Weimar.
Tharant near Dresden, Saxony.
Neustadt Eberswald, near Berlin.
Münden in Hanover.
Giessen in Hesse.
Carlsruhe in Baden.
Hohenheim, near Stuttgart, in Würtemberg.
Aschaffenburg in Bavaria.

The academies at Neustadt Eberswald and Aschaffenburg are for the study of forestry alone, while in the others the pursuit of agricultural or engineering knowledge is combined with it. In Germany the forest service is a state department, filled by youths of good position, who are specially trained for the purpose. The period of training extends over five years, and its course is thus described by Campbell Walker.[1]

> "Nothing struck me as more remarkable than the extent and varied nature of the studies required from forest candidates or probationers in Prussia, and the number of years they are content to spend, first in studying and then in waiting for an appointment. The would-be *oberförster* must, after passing certain terms at a Government school of the first class, spend a year with an oberförster in a 'revier,' and then pass an examination as forest pupil, after which there is a two years' course at a forest academy, and an examination in scientific forestry, land surveying, etc., on passing which the pupil becomes a *forst-kandidat;* then other two years' practical study, during at least nine months of which he must actually perform the duties of a forester, after which comes the final Government examination, on passing which he enters the grade of *oberförster-kandidat*. The difference betwixt the two examinations is that the first tests the candidate's knowledge of theoretical forestry and cognate sciences, whilst the latter tests his ability to apply what he has learnt and capability for employment as oberförster and in the higher grades. After passing the final examination the *oberförster-kandidat* is employed as an assistant in the academies and control offices, in making forest surveys and working plans, and sometimes acting in charge of a revier, receiving certain daily or weekly allowances whilst so employed. After five or six years of this probation he may look forward to being permanently appointed. Thus we have at least five years spent in study and other five in probation,—the former without any pay, and the latter only with meagre allowances, whilst actually employed, before the would-be forest officer is installed; and the time is generally much longer. Yet so great is the desire for Government service, and particularly forest service, in Prussia, and indeed in Germany generally, that there is no lack of competitors.
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> "The forests form part of the revenue department, and are presided over by an *oberland-forstmeister* and *ministerial direktor*, aided by a revenue councillor and joint *ministerial direktor* and a numerous council, with suitable establishments and secretaries for the various branches. . . . The *oberland-forstmeister* is governor of the academies, and at the head of each is an *ober-forstmeister*, aided by a numerous staff of professors and assistants. . . . There is a control office of account at Potsdam, where all the forest accounts of the several provinces are finally audited before going to the ministry of finance. . . . The 12 provinces of Prussia are divided into 30 circles (*Regierungsbezirk*), and to each of these an *ober-forstmeister* is appointed to represent the forest department in the council of local administration (*Regierung*), and aided by councillors and by the *forst-*

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[1] *Reports on Forest Management*, London, 1872.

meisters, as a board, to represent forest interests in the Government, and administer the department to the best advantage. Next in order come the *forstmeisters*, numbering 108, in charge of divisions with an average area of 25,000 hectares, and then the executive officers, 706 *oberförsters*, with charges averaging about 3000 hectares, to each of which is attached a *forstrendant*, or collector of forest revenue, and 3646 *försters* (or overseers), with ranges of from 500 to 1000 hectares. The forests have all been surveyed, valued, and divided into blocks, and there are accurate maps representing the extent and situation of each forest district, and the description and age of the timber growing in each block. Whatever be the size of the woods every tree is recorded, and a working plan is drawn out and followed,—certain species being destined to longer or shorter growth, according to their promise of vitality or liability to decay. It may be remarked that such maps form the starting point of every true system of forestry."

At Aschaffenburg, which may be taken as an example of German forest schools, candidates for Government forest service must first pass the standard of the higher school or gymnasium, which includes classics, mathematics, natural history, and chemistry. They are usually seventeen to nineteen years of age, and they first become apprentices for one year, assisting in the practical work of a forest district. The forest curriculum extends over two and a half years. Besides the director, there are four professors, who teach the following subjects:

I. *Forestry*. General management, planting operations, valuation surveys, rotation and details of working plan, transport and sale of timber and other forest produce.

II. *Natural Sciences*, with special reference to forest requirements: meteorological phenomena, organic chemistry, nutrition of plants, systematic botany and zoology, entomology.

III. *Mechanics*. *Surveying* and *Engineering*, with *Road-making*.

IV. *Forest Legislation* and *Police*.

Practical instruction is given in the laboratory, and excursions are made in the forest. The students who pass the final examination, after five years' training, are qualified for appointments in the forest service. Careful observations are made at Aschaffenburg regarding the influence of forests on the air and soil, their hygienic importance and effect on climate.

Austria.—Austria, including Hungary and Bohemia, possesses a vast amount of timber, about one-third of the productive area being returned as woodland, and covering 66,000 square miles, situated more in the east than in the west. There are 2,330,000 acres of forest belonging to the state, chiefly in Croatia, Slavonia, Transylvania, and the Alpine regions throughout the empire. Dalmatia and Istria alone have a deficient supply of timber, owing to previous devastations; but the Government is here making great efforts to restore the forests. The prevailing trees in the higher altitudes are *Abies excelsa* and *pectinata* and *Pinus montana* and *Laricio*. The larch mingles largely with the pines. In the low-lying tracts of the Alps and Carpathian mountains the beech is the principal tree; in the north-west several species of oak; in the south the elm, poplar, chestnut, and walnut. In Dalmatia and southern Tyrol the olive, mulberry, and fig trees abound. Austria produces annually about 67 million cubic feet of timber; and of other forest products the following are principal items:—

500,000 cwts. gall-nuts.	250,000 cwts. turpentine and resin.
100,000 " potash.	4,000,000 " tanning bark.

The total income in 1872 from the Austrian state forests was 4,148,000 gulden, the expenditure 3,049,000 gulden, leaving a net profit of about £90,000. The Austrian Government are wisely desirous to conserve and utilize their valuable forest property, and there is a state forest department with a staff of 1170 persons, 22 of whom are skilled officers of high position. In parts of Bohemia and Hungary entire forests have been destroyed, rendering useless much soil that is unfit for agriculture. Encouragement is given by the state to persons who make successful efforts to plant denuded ground.

Scientific forestry is not so advanced as in Germany, but increasing attention is being given to the subject. The principal forest academies are at Marien-brunn near Vienna, with a large staff of professors, a laboratory and museum, and at Schemnitz in Hungary. The courses last three years after passing the gymnasium examination, as at Aschaffenburg. Other academies for training more exclusively in the practice of forestry have a shorter course.

Russia.—The inequality of the distribution of wood in the Russian empire is very remarkable. The north of Great Russia, the government of Perm, and Finland have a large proportion of forest land, and the export of timber from Archangel, St. Petersburg, and Riga is very great. In central Russia there are also large and valuable forests, but in the south they become scanty. It was recently reported at the annual meeting of the geographical society of Vienna by Councillor Wex, that the Volga is decreasing in volume owing to the destruction of wood in its valley, so as to affect materially the level of the Caspian Sea and Sea of Aral. With the exception of Bessarabia and the Caucasus, including the region south-west of the Caspian, the southern districts of Russia bordering the Black and Caspian Seas are extremely bare of wood, and for household fuel the people use a compost of straw, leaves, etc. The Government has attempted the planting of portions of the vast steppes, and near Odessa there are fine plantations of *Ailanthus glandulosa*, which give promise of success to further plantings (Marsh). The following statistics of the proportion of woodland in Russia are given in the *Journal of Forestry*, 1877:—

"There are in European Russia alone 172,418,000 dessiatins (about 400,500,000 acres) of forests, or 43·3 per cent. of the entire territory. Such an extent of forests is not to be found in any other country of Europe. Two-thirds, or 66 per cent., of the mass of forests extend over the north-eastern districts; then follow the north-western governments, where the relative proportion to the general area is 30 to 50 per cent. In the middle Volga, the Baltic, and western and central provinces the proportion is 27·2 per cent., in the south-western it is 2·5 per cent., in the Little Russia and Steppe governments, including the Crimea, it is only 0·7 per cent. Finland and the Caucasus are not included, which contain splendid timber in great variety, nor the Polish governments, where the forests occupy a very extensive area."

In the Paris Exhibition Report, 1867, the area of forest in Finland is given at 2,500,000 acres, but in the most accessible parts wasteful and serious denudation has taken place.

The Scotch fir, the spruce, and the Siberian larch are the most common coniferous trees in Russia. The spruce penetrates furthest north, the Scotch fir grows well in the Crimea and the Caucasus, while the larch is chiefly found in the district drained by the Petchora river, and throughout Siberia. These three form the staple of the Russian timber export trade. Birch is also a tree of the northern latitudes, and extends eastwards as far as Kamchatka. In the central and over a large part of the southern portions of European Russia there are good forests of oak, and the beech, boxwood, ash, lime, maple, and walnut all grow in more or less profusion. The oak does not cross the Urals. The ridges of the Crimea are clothed with Corsican pine (*Pinus Laricio*), while the Scotch fir and beech form fine forests in the Caucasus.

The annual consumption of wood within the Russian empire is enormous, the estimated value being 260 millions of roubles, the railways requiring for fuel alone 7 million roubles' worth. In the absence of stone nearly all the buildings are made of wood. Every year upwards of 100,000 vessels of different descriptions descend the Russian rivers, most of which on reaching their destination are broken up for building or fuel. Scotch fir and spruce are usually employed for this purpose. The collection of resin and tar in the northern provinces is very great, about 7000 tons of tar being annually exported. A new industry has sprung up of late years, viz., making pulp for paper from the wood of the aspen, a tree which readily reproduces itself. The lime furnishes material for rope, cordage, and matting.

In 1858, Baron von Berg, a distinguished forest officer of Saxony, was requested to report on the forests and forest management of Finland, and subsequently also of Poland. The establishment of two schools of forestry resulted from his visit. At the school of Nova Alexandria in Poland, established in 1858, the teaching of agriculture is combined with that of forestry. The passing of a gymnasium examination is necessary before admission. The course of study covers three years, when, after the final examination, the students receive a diploma entitling them to employment in the service of Government. At Evois in Finland, where the school was founded in 1859, the instruction is in forestry only. Though at the commencement the education and quarters were given free, the school had to be closed for lack of pupils; but in 1874 it was reorganized, and now it seems to be in a flourishing condition. The course extends to two years, and the instruction includes forest law and economy, surveying, book-keeping, engineering, mathematics, and kindred subjects. A forest school also exists at Peteroffsky near Moscow, and another at Berdiansk on the Sea of Azoff, and many young Russians have been sent to the French and German schools to acquire a knowledge of forest science.

Roumania.—It is computed that there are in Roumania 2 million acres of forest land, though not wholly covered with wood. In the plains species of oak predominate, and according to elevation, walnut, beech, yew, silver fir, and spruce. But the coniferous trees have mostly disappeared, and the forests have been greatly damaged, while, owing to grazing rights, no young trees have been allowed to spring up. A small forest staff has now been appointed, and plans are being formed for the establishment of a school for training forest assistants.

France.—The principal timber tree of France is the oak, and various species are much cultivated. The cork oak is grown extensively in the south and in Corsica. The beech, ash, elm, maple, birch, walnut, and poplar are all important trees, while the silver fir and spruce form magnificent forests in the Vosges and Jura Mountains, and the Aleppo and maritime pines are cultivated in the south and south-west. About one-seventh of the entire territory is still covered with wood.

Forest legislation took its rise in France about the middle of the 16th century, and the great minister Sully urged the enforcement of restrictive forest laws. In 1669 a fixed treatment of state forests was enacted, and in 1750 Mirabeau estimated the woodlands in France at 70 millions hectares. Duhamel in 1755 published his famous work on forest trees. Reckless destruction of the forests, however, was in progress, and the Revolution of 1789 gave a fresh stimulus to the work of devastation. The usual results have followed in the frequency and destructiveness of floods, which have washed away the soil from the hill sides and valleys of many districts, especially in the south, and the frequent inundations of the last fifty years are no doubt caused by the deforesting of the sources of the Rhone and Saone. Laws were passed in 1860 and 1864, providing for the reforesting, "reboisement," of the slopes of mountains, and these laws take effect on private as well as state property. Beneficial results have already ensued. Thousands of acres are annually planted in the departments of Hautes and Basses Alps; and during the summer of 1875, when much injury was done by floods in the south of France, the Durance, formerly the most dangerous in this respect of French rivers, gave little cause for anxiety, and it is round the head waters of this river that the chief plantations have been formed. While tracts formerly covered with wood have been replanted, plantations have been formed on the white shifting sands or dunes along the coast of Gascony. A forest of *Pinus Pinaster*, 150 miles in length and from 2 to 6 broad, now stretches from Bayonne to the mouth of the Gironde, raised by means of sowing steadily continued since 1789; and the cultivation of the same pine in the department of Landes has, along with draining, transformed low marshy grounds into productive soil. With the provinces of Alsace and Lorraine, a large extent of forest was ceded to Germany in 1871.

An official report, dated 1872, gives the following forest areas:—

State forests	900,000	hectares.
Communal forests	2,000,000	"
Private forests	6,000,000	"
Total	8,900,000	hectares.

In 1877 the French state forests contained 985,086 hectares, and the communal 1,919,622 hectares. The revenue in 1827 amounted to 27,000,000 francs, three-fourths of which was from the sale of timber, and one-fourth from other forest produce. The estimated revenue for 1877 was 38,500,000 francs, 29,500,000 of which was to come from the regular fellings, and the remainder from extraordinary cuttings and minor forest produce. The annual expenses of the forest department average 13,000,000 francs. For 1877 the actual figures were 13,325,732 francs, of which about 5,000,000 is for the pay of the establishment, two and a half millions for roads, two for plantations, and the balance for conservancy and management.

The department is administered by the director general, who has his headquarters at Paris, assisted by a board of administration, who meet twice a week, and are charged with the working of the forests, questions of rights and law, finance, and plantation works. The establishment consists of 36 conservators, 174 inspectors, 310 sub-inspectors, and about 420 *gardes généraux*, the number being regulated by the exigences of the service.

The department is supplied with officers from the forest school at Nancy. This institution was founded in 1824, when M. Lorentz, who had studied forestry in Germany, was appointed its first director. Any French youth from eighteen to twenty years of age may compete for admission to the school on producing certain certificates and filing a bond guaranteeing the payment of 1500 francs a year, and 600 francs from the date of his joining the establishment till he is promoted *garde général* on full pay. The entrance examination comprises arithmetic, algebra, geometry, trigonometry, physical sciences, chemistry, plan-drawing, mechanics, German, history, geography, and free-hand drawing. The pupils pass two years in the school, and during a third attend lectures, while taking practical charge of portions of forest near Nancy. The school is under a director, a sub-director, and eight professors, besides two officers for military instruction. In the winter session eight hours daily are spent in the school, and the summer term is chiefly passed in forest tours, the pupils accompanying the professors, who apply the teaching of the school to objects found in the forest. There are usually 45 to 50 French pupils. The French Government has kindly extended the benefits of this well-equipped institution to candidates for employment in the state forests of British India.

Switzerland.—Forests in Switzerland cover about 18 per cent., or one-sixth of the whole area, but in some of the cantons excessive deforesting has taken place. On the precipitous mountain sides the forest is found to have a powerful influence in preventing the formation and descent of avalanches, and in the Alps the woods are preserved, though insufficiently, by law. A distinguishing feature of Swiss forests is the prevalence of the silver fir, *Abies pectinata*, which covers large tracts on the mountains up to 4000 feet; the larch is sometimes mixed with beech to 3000 feet, more rarely with oak and walnut to 1800 feet, and chestnut to 750 feet. Each canton regulates the management of forests within its own limits; but efforts repeatedly made in the Federal Council for the introduction of a uniform system of forest legislation throughout the republic have not yet been successful.

Vigorous attempts to preserve and restore wooded land are made in some of the cantons, and difficulties in the transport of timber from inaccessible points have been skilfully overcome by the ingenious adaptation of wooden tramways and iron rope slips.

Italy.—The kingdom of Italy comprises such different climates that within its limits we find the birch and pines of northern Europe, and the olive, fig, manna-ash, and palm of more southern latitudes. The ascertained extent of wood in 1872, including the wooded island of Sardinia, was, according to Siemoni, 5,025,893 hectares, or about 17·63 per cent. of the entire kingdom, a proportion which might with advantage be greatly increased, but in the latest return it has fallen to 12·34. By the republic of Venice and the duchy of Genoa forestal legislation was attempted at various periods from the 15th century downwards. These efforts were not successful, as the Governments were lax in enforcing the laws. In 1789 Pius VI. issued regulations prohibiting felling without license, and later orders were published by his successors in the Pontifical States. In Lombardy the woods, which fifty years ago reached nearly down to Milan, have almost disappeared. The province of Como contains only a remnant of the primitive forests, and the same may also be said of the southern slopes of Tyrol. At Ravenna there is still a large forest of stone pine, *Pinus Pinea*, though it has been reduced to a third of its former extent. The plains of Tuscany are adorned with planted trees, the olive, mulberry, fig, and almond. Sardinia is rich in woods, which cover one fifth of the area, and contain a large amount of oak, *Quercus Suber*, *Robur*, and *Cerris*. In Sicily the forests have been long felled save the zone at the base of Mount Etna.

The destruction of woods has been gradual but persistent; in the end of the 17th century the effects of denudation were first felt in the destructive force given to mountain torrents by the deforesting of the Apennines, and up to the present time the work of demolition continues. According to the statistics published by the Italian Government in 1870, there were 215,801 hectares of state forest, including woods attached to royal residences; but by the sale, alienation, or destruction of the greater part, the area has since been very greatly reduced. Of communal and private forests the extent is, according to Government statistics,

	1870.	1877.
Communal forests	2,169,914 hectares	1,580,000 hectares.
Private forests	2,662,178 "	2,040,401 "

Only about 1,500,000 hectares are really covered with timber, as these figures include land with mere coppice or brushwood.

In 1867 the monastic property of Vallombrosa, Tuscany, 30 miles from Florence, was purchased by Government for the purposes of a forest academy, which was opened in 1869, and energetic measures were initiated throughout the kingdom for the preservation of the remaining woods. It is to be regretted that, by a change of policy, the area of forest has now greatly decreased. The administrative staff consists of 3 inspectors general, 35 forest inspectors, and about 300 subordinate officials. The royal forest school at Vallombrosa is surrounded by a splendid forest of silver fir, and a large extent of broad-leaved chestnut, beech, and other trees is also attached to it. *Pinus halepensis* and *Pinea* and larch are the other prevailing conifers. The number of pupils is about 60, and the course of study resembles that at Nancy. A forest periodical is regularly published at Florence. Director di Berenger, who has superintended the school from its foundation, is a man of great learning, and author of several important works on forestry.

Spain and Portugal are very deficient in woodland. The Peninsula is not unsuited to the growth of timber, as evinced by the noble forests which existed in the times of the Moors, especially in the southern provinces. There was a code of forest laws in Spain in the reign of Philip II., but it seems never to have been carried out, and the fine forests have long since disappeared. The evils of denudation are perhaps nowhere more signally exemplified than in Spain, and "Rentzsch even goes so far as to ascribe the political decadence of Spain wholly to the destruction of the forests" (Marsh, p. 306). Although her physical conditions render a large extent of forest almost indispensable to industrial progress, Spain may be said to be the only European country, with perhaps the exception of Great Britain, in which there has been no provision for the protection of woods.

The evergreen oak (*Quercus Ilex*), and its congener the cork oak (*Quercus Suber*), are found associated with *Pinus Pinaster*. "The Sierra de las Albujarras, southward of the city of Granada, is clothed with fir woods up to the peaks on certain places, so that the existing forests would appear to be the remnants of a destroyed girdle of coniferous trees, formerly covering all these chains. In the fluviatile valleys of the Sierra Nevada isolated groups of trees present themselves, the wrecks of larger woods" (Henfrey, p. 295). In central Spain and on the slopes of the Pyrenees there are still considerable tracts covered with *Pinus Laricio*, *P. pyrenaica*, and *P. halepensis*, while on the northern coast *Pinus Pinaster* abounds. The sweet chestnut, indigenous in Spain, forms forests more or less cultivated for the sake of its fruit, which is an important article of food.

A forest school has been lately established in the Escorial, and good results from the training there may be hoped for.

The proportion of woodland in Portugal is nearly the same as that of Spain; but a system of management is in operation under an administrator-general of forests. There are three forest zones characterized by the pine, the evergreen oak, and the deciduous oak. *Pinus Pinaster* abounds on the coast, giving place south of Lisbon to *P. Pinea*, the stone pine. The largest forest is that of Leiria, composed chiefly of the maritime pine, *Pinus Pinaster*; and adjoining the forest are establishments for the preparation of tar and resin, and the impregnation of wood.

ASIA.[1]

India.—The forests of British India are of great extent and value. Under the rule of Hindu and Mahometan princes, as well as in the earlier years of British domination, the forests were recklessly injured by felling, or by the recurrence of destructive fires, thereby deteriorating the climate and impoverishing the people. But conservancy has been introduced in time to preserve many of the advantages they are calculated to afford, to make them a considerable source of revenue to the state, and to provide for the needs of future generations. The change from uncontrolled waste to careful state supervision is necessarily slow: immemorial usages have to be overcome, and many obstructions to be removed, before the department is in good working order; great progress has, however, been made. The forest department is now a branch of the public service, for which candidates are annually selected by the Secretary of State for India.

Attention was first directed to conservation in India by the appointment of a committee by the British Association in Edinburgh in 1850, to consider the "probable effects, in an economical and physical point of view, of the destruction of tropical forests;" and a report was printed in 1851, showing the importance of preserving every influence which tends to maintain an equilibrium of temperature and humidity, of preventing the waste of valuable material, and the special application to their various uses of the indigenous timbers of the country. Indian botanists, to their credit, had long urged on the Government the necessity of stopping the waste of valuable timber. Advancing civilization, the progress of agriculture, and the rapid extension of railways soon rendered it imperative that means should be taken to organize a general system of forest administration, to control the clearing of indigenous forests, and to economize public property for the public good. About 1855 the first attempts at organization were made, the executive arrangements being left to the local administrations. In Bombay, Burmah, and Madras, conservators were appointed who started as it were single-handed and without skilled assistance, depending on such help as could be found in the local services. After the mutiny of 1857 a staff of five or six assistants was sanctioned in each of these provinces, the more valuable forests were mapped out, and exact information was obtained regarding their resources. In 1862 the Government of India organized a departmental system of conservancy for the whole empire, and the office of inspector general of forests was created. A Forest Act, No. 4 of 1864, gave power to local administrations to demarcate the limits of state forests, and to reserve certain trees for state purposes, and notified the mode of procedure in cases of damage, conflagration, etc.; and in October, 1877, the report of a select committee on a bill to amend the law relating to the preservation of state forests was under the consideration of the Indian Government. Many of the forest officers first appointed were chosen because of local knowledge and love for natural history rather than their knowledge of practical forestry, but with these extended operations the want of trained assistants soon became apparent. It was therefore determined to train young men specially for the work, and as forestry is in France a branch of Government service, advantage is taken of the forest school at Nancy in France, and five or six youths, after having passed through the usual course of study there, both theoretical and practical, are annually sent to India. In 1876 the officers of the higher grades had increased to 147,—1 inspector general, 10 conservators of provinces, 136 deputies and assistants. The post of inspector general is held by Dr. Dietrich Brandis, to whose energy and experience is in great measure due the success which has attended the progress of the department.

Many large and valuable tracts of forest are in the territories of native chiefs; and to prevent these being wholly destroyed, the British Government leases them for a long term of years, paying an annual rent, or a seigniorage on each tree felled. Throughout the empire the forest lands are burdened with grazing and other village rights, and it has required much tact to effect the formation of forest reserves to their present extent. As opportunity offers, unreserved forests are added to the reserves. The following figures embrace all the provinces under the Government of India (excluding Madras and Bombay). In 1875–6 the area of reserved and leased forests was 15,089 square miles, being an increase of 3000 square miles during the year. The aggregate area of plantations is about 26,000 acres, and the trees cultivated in the different provinces are as follows:—

Bengal	Toon and Teak.
North-West Provinces	Deodar, Walnut and Horse-chestnut.
Punjab	Deodar, Sissu, Kikar, Ber, and Mulberry.
Burmah	Teak.
Assam	Caoutchouc.
Madras	Teak, Red Sanderswood, Casuarina, Eucalyptus.
Coorg and Mysore	Teak and Sandalwood.
Berar	Teak and Babool.
Oudh	Sal.

The most important articles of export are teak, sandalwood, cutch, caoutchouc, and lac, the last chiefly from the Central Provinces. In 1875–6 the following amounts were exported from India:—

	Tons.	Prices per Ton.
Caoutchouc	763	1282 rupees.
Shell-lac	4,032	1613 "
Lac-Dye	533	500 "
Sandalwood	500	500 "
Cutch (Catechu)	9,762	173 "
Myrobalans	14,317	74 "
Teak (50 cubic feet)	60,656	73 "

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[1] A very comprehensive view of the geographic botany of the Asiatic continent and the distribution of its flora will be found in the article ASIA.

The export of teak commenced about 1829, after the annexation of Tenasserim, and at first it was only from British territory. In 1835 teak began to come from beyond the frontier in largely increasing quantities. After the annexation of Pegu forest operations in British territory were regulated, and the average export to Indian and foreign ports from 1856 to 1862 was 20,000 tons, four times that amount coming from beyond the frontier. Nearly two-thirds of the teak goes to Calcutta, Madras, and Bombay, and the rest to Britain. The finest teak plantation is the Conolly plantation in Malabar on the Beypur River (Madras Presidency), where the rainfall is 150 inches annually. It now covers about 4000 acres, and 100 acres are added every year. The result has been most satisfactory, in the provision of an immense stock of valuable material, and the outlay incurred is being gradually recouped.

Cutch, the extract of the heartwood of *Acacia Catechu*, comes chiefly from Burmah, partly from Mysore and Malabar. It is used for tanning and dyeing. Lac is chiefly produced in Central India; the collection is expensive, but the quantity may be still further increased. *Butea frondosa* and *Schleichera trijuga* are the chief lac-yielding trees. Caoutchouc, the produce of *Ficus elastica*, is collected in Assam and Sikkim, and latterly also in Burmah, where, however, the tree is not indigenous. Most of the sandalwood of commerce (*Santalum album*) is from Mysore and Coorg, and is exported from Bombay. In Mysore more than half of the forest revenue is derived from this tree.

The surplus forest revenue from the different provinces for 1875–6 was as follows:—

The Presidency of Bengal	22,86,840	rupees.
Madras.....(deficiency	3,724)	"
Bombay	4,70,195	"
	27,53,311	rupees.
Native States Administered.		
Mysore	15,257	rupees.
Berar	1,41,943	"
Total	29,10,511	rupees, or £291,051.

Much expenditure is needful for improving the roads through the forests, and for the blasting of rocks in rivers, which, both in the plains and in the Himalaya, are much used for floating logs. Fuel plantations on a large scale, especially in Madras and the Punjab, have been formed for the supply of railways and steamboats; the demarcation of forests is steadily carried on, the reserves are mapped, and laws are in force for the exclusion of cattle from the reserves and for the prevention of fires; waste has been prohibited, and in many ways a gradual improvement is taking place. New species of trees of rapid growth are being acclimatized. "From Australia several kinds of *Eucalyptus* and *Acacia* were introduced about twenty-five years ago, and they have made such progress that the station of Ootacamund is now almost surrounded by a forest of these trees. Their rate of growth is wonderfully fast, much faster than that of the indigenous trees. Young forests of the quinine-yielding *Cinchonas* are coming up in many places. The management of these cinchona woods will probably be similar to the treatment of oak coppice in England; for though oak bark has not one-twentieth the value of Jesuit's bark, it is the bark in both cases for which these woods are mainly cultivated. There will, however, be the difference that while oak coppice in Europe, after having been cut over, requires from fourteen to twenty years to yield another crop of bark, cinchonas grow so rapidly that they may probably be cut over every eighth or tenth year." It has been decided to establish a forest school in North India for training candidates for the executive branches of service, and to attach to it a large area of reserved forest.

The teak, *Tectona grandis*, may be called the king of Indian timber trees; it is prized for shipbuilding beyond any other wood, and is specially valuable for works in contact with iron. It is indigenous in Hindustan as well as in Burmah and the neighboring states, generally growing in company with bamboos and other trees in dry deciduous woods. It grows to perfection in Malabar and West Burmah, where the rainfall is heaviest. The northern limit is about 25° N. lat. The sal, *Shorea robusta*, another most important tree, forms extensive pure forests along the base of the Himalaya, from Assam to the Sutlej, and in the eastern part of Central India. It yields a heavy durable timber, in great demand for building, gun carriages, and railway sleepers. The deodar, *Cedrus Deodara*, is to North India what teak is to Madras, Bombay, and Burmah, and what sal is to Bengal and the great Ganges Doab. It is indigenous in the north-west Himalaya and the mountains of Afghanistan, and forms extensive forests in the basins of the Indus, Tonse, Jumna, and Bhagirati rivers. Black wood (*Dalbergia latifolia*) and sissu (*Dalbergia Sissu*), toon (*Cedrela Toona*), satin wood (*Chloroxylon Swietenia*), sandalwood (*Santalum album*), red sanderswood (*Pterocarpus santalinus*), and the various kinds of ebony (*Diospyros*) are amongst the most important of the many valuable woods of India.

Official Reports on Forest Conservancy (4 vols. folio), showing the progress of departmental administration in India from 1862 to 1871, issued among parliamentary papers, contain much statistical and practical information. The advance of forest management in India has led to the publication of three useful handbooks:—(1) *The Flora Sylvatica of South India*, by Col. R. H. Beddome, Madras, 1873; (2) the admirable *Forest Flora of North-West and Central India*, by Dr. Brandis, London, 1874; and (3) *The Forest Flora of British Burmah*, by the late Sulpiz Kurz, Calcutta, 1877. The systematic working of the forests has also been facilitated by the publication of a code for the transaction of forest business. There is an annual conference of forest officers, when questions of principle and practice are discussed; and a quarterly magazine of forestry—*The Indian Forester*—published in Calcutta, has been established for the record of observations and experiments. For a classified list of trees with vernacular names and local uses, see the works cited, and the jury reports of the Madras and Punjab Exhibitions; Cleghorn's *Forests and Gardens of South India*, 1861; Drury's *Useful Plants of India*, 1873; Dalzell's *Bombay Flora*, 1861; and Stewart's *Punjab Plants*, 1869.

Ceylon.—The coast of Ceylon is fringed with the cocoa palm; the betel palm, talipat, and palmyra also abound, the last in the north of the island, while the interior is richly wooded, having ebony, calamander, satinwood, and 30 or 40 varieties of timber valued for construction and shipbuilding, but no teak. Forest reserves are being formed. (See *Enumeratio Plantarum Zeylaniæ*, Thwaites, 1864.)

Siam.—The forests of Siam contain a large amount of teak, some of which has been exported. Other principal trees are gamboge (*Garcinia*), gutta-percha (*Isonandra*), eagle wood (*Aquilaria Agallocha*), ratans, durian, mangosteen (*Garcinia Mangostana*), and several valuable palms, as the sago (*Sagus farinifera*).

Borneo is remarkable for its luxuriant vegetation, and the extensive forests produce ironwood, gutta-percha, ebony, sandalwood, ratans, sapanwood, gambir, dragon-blood, sago palm, and the mast (*Calophyllum*) and camphor trees (*Dryabalonops*).

China.—The forest area of the great empire of China is little known, especially in the northern half, which resembles Japan. In the west there are large forests containing ebony, sandalwood, camphor tree, tallow tree (*Stillingia sebifera*), mulberry, paper-mulberry (*Broussonetia papyrifera*), varnish tree, funeral cypress. The mountain regions of the islands of Formosa and Hainau are well wooded. From Formosa we obtain most of our supply of the camphor of commerce. (See Fortune's *China*, and Bentham's *Flora Hong-kongensis*.)

Japan is well wooded, and the arboreal flora presents a remarkable combination of sub-tropical and temperate forms,—the tree-fern, bamboo, banana, and palm growing with the pine, the oak, the beech, and Coniferæ in great variety. The evergreen oaks and the maples are the finest of all Japan trees, whilst the *Rhus vernicifera* or lacquer tree, *R. succedanea* or vegetable-wax tree, *Laurus camphora* or camphor tree, and paper-mulberry are among the remarkable or characteristic trees of the country. (Siebold and Zuccarini's *Flora Japonica*.)

Siberia possesses immense tracts of forest, particularly in the neighborhood of Tobolsk, Tomsk, and Ekaterinburg. Pines, larch, cedar, and birch are the principal trees on the mountains north of the great steppes and marshy plains. The northern limit of the pine is about 70°. Willows, alders, and poplars are used for fuel on the plains. Elms and wild apricots are mentioned by travellers, but the oak is not indigenous. It is estimated that Siberia contains 2,000,000 acres of forest in the districts above named. The vast plateau of Tartary and Tibet is of great sterility, dry, and almost treeless, and the climate is very unpropitious. In Manchuria there are extensive coniferous forests, and on the east coast there is said to be oak on the mountains, while on the low land the maple, willow, apricot, and mulberry are found.

AMERICA.

America is of all quarters of the world the most thickly wooded with primeval forest. The territory on the north-west coast and islands is well stocked with pine timber.

Canada.—The forests of British North America are of the first importance for the comfort and welfare of its people, as no coal is found in the centre of the Canadian Dominion. Canada contained immense forests, which are still extensive, chiefly of black and white spruce, the Weymouth (*Pinus Strobus*) and other pines, which grow to a great height and do not admit of undergrowth. The dark and sombre forests are also rich in other commercial woods, such as oaks, ash, maple, hickory, and walnut. The export of timber is very great, and Great Britain draws more from Canada than from any other country. *Pinus Strobus* yields the largest amount, and is the most valuable of Canadian woods. It is now chiefly obtained from the head waters of tributaries of the St. Lawrence. The extensive lumber trade is causing rapid denudation. Tracts of land are let to "Lumber Companies," whose object is to get as large a return as possible, and annually thousands of acres are destroyed by fire. An Act has recently been passed regarding the public lands of the Dominion, which provides for the care of young trees; and in Quebec it is no longer permitted to cut pine trees less than 1 foot diameter at the stump. It has also been proposed to establish a school of forestry.

United States.—The primitive forests of America were of immense extent, and contained a remarkable diversity of species, covering in the 17th century, with insignificant exceptions, all that portion of the North American continent which has been occupied by British colonists, and apparently adequate to the exigences of advancing settlements to an indefinite future; but now, it is "doubtful if any American State, except perhaps Oregon, has more woodland than it ought permanently to preserve" (Marsh, p. 326). About 40 species of oak are indigenous in America, 16 conifers, several maples, birch, ash, beech, elm, hornbeam, hickory, poplar, magnolia, walnut, butternut, etc. The eastern and midland States were at one time dense forests; now, Pennsylvania alone excepted, these are denuded of the pines and other commercial woods, and are compelled to draw much of their supply from Canada and the West. Even the forests in Pennsylvania, which once yielded the finest pines in America, are now greatly reduced in extent and value. The earliest restrictive measure of Government was adopted in 1817, when oak and red cedar were reserved; and a law was passed in 1831 to arrest spoliation. The enormous supplies of timber still brought to market may be judged of from the fact that the number of saw-mills in 1870 was 25,817—an increase of over 6000 in ten years. Fortunately public opinion has been aroused, and a Forestry Association has been formed, to show the vast annual decrease of forests, and the urgent necessity of planting to a large extent. In Massachusetts valuable prizes are offered for planting white ash and white pine, spruce and larch, with a view to the raising of useful timber, and affording the needed shelter to the crops. In 1858 a premium of 1000 dollars was offered for the best plantation of forest trees planted in 1860, payable in 1870. The States of Illinois, Missouri, and Iowa have also encouraged tree-planting by State laws. Further west, in the prairie regions, energetic measures are being adopted to create woodlands on hitherto treeless plains. In Nebraska ash, walnut, and elm are largely planted, and along the Central Pacific Railway belts of Australian gum and other trees are being formed to protect the line from snow drifts, and for a future supply of timber. In the State of California a forester has been appointed, and legal provision made to render the discharge of his duties effectual. By a law of California, dated 30th March, 1868, the board of supervisors in each county are empowered to authorize owners of lands to plant and cultivate, along the public highways, shade and fruit trees, specifying the species to be planted, at what age, at what distance from each other and from the road bed, and making the necessary rules for their protection, etc. Four years after the planting, upon receiving a duly certified statement of the number then in a good condition, the board are directed to pay to the cultivator one dollar for each such tree. California still possesses her magnificent Sequoias, *S. gigantea*, which attain when full grown an average height of 275 feet, and a girth of 70 feet at 6 feet from the ground. Sir J. D. Hooker tells of a forest forty miles long, and 3 to 10 broad, in the Sierra Nevada, where alone the tree is indigenous. Wood-cutters and saw-mills are, however, busy at work, converting the valuable Sequoias into marketable timber, and sheep grazing and fires kindled by the lumbermen are effectually destroying the saplings. Hooker writes in 1878—"The devastation of the Californian forest is proceeding at a rate which is utterly incredible, except to an eye-witness. It is true that a few of the most insignificant groves of the big trees at the northern extreme of its range are protected by the State legislature, and a law has been enacted forbidding the felling of trees over 15 feet in diameter; but there is no law to prevent the cutting or burning of the saplings, on which the perpetuation of the grove depends, or to prevent the burning of the old trees, which, if they do escape the fire, will succumb to the drought which the sweeping away of the environing forest will occasion." In Texas, where there is a very inadequate supply of timber, the growth of trees on the prairies is being attempted, but the frequency and destructiveness of prairie fires are great obstacles to success.

Central America.—Mexico and the various states of the isthmus uniting North and South America, as well as the West Indian Islands, possess abundant forests, which are as yet, however, imperfectly known. But they contain many fine timbers in large quantities, the chief of which, mahogany, *Swietenia Mahagoni*, deserves special notice. The mahogany tree is found on the mainland and in the West Indian Islands between 11° and 20° N. lat. It grows to a large size, with a perfectly straight stem, and is exported from the different states and islands where it grows. That which comes from British Honduras is esteemed the best, but the supply from there has declined of late years. Mahogany was first imported into England about 1640. It has been introduced into Bengal and Malabar. In the neighborhood of Panama 2000 persons are employed in drawing off the juice of *Castilloa elastica*, the Central American caoutchouc tree, and in Nicaragua 600 to 800 persons find similar employment. (See *Nature*, 1875.)

Cuba.—For variety and value the woods of Cuba rival those of the mainland, but the Government forests have been neglected and left to chance and plunder. There has been no attempt to control the misuse, waste, and wanton destruction of forest. Valuable timber is felled for making enclosures, and much is burnt. Almost all the remaining woods belong to private persons. Mahogany, cedar, and fustic wood, with many others, are produced freely. During last century forty-two ships of war were built in the Royal Arsenal of Havana, and with proper management much timber for naval purposes might be obtained.

South America.—The richness and luxuriance of the tropical vegetation in South America are proverbial, and the whole chain of the Andes is clothed with wood, varying according to elevation, latitude, and aspect. Owing to the scarcity and high price of labor, with the few facilities of transport to the sea-coast, the timber trade of South America has not as yet reached great dimensions; but with the increase of population and the opening up of the country this commerce will be vastly developed. No data as to the extent of forest area are available, but with great variety of climate in the vast continent there is great diversity also in the vegetation. Each state has its own special forest-products to export, of which, however, we can only name a few of the more valuable.

British Guiana furnishes two of the most valuable timbers known for shipbuilding, greenheart (*Nectandra Rodiæi*) and mora (*Mora excelsa*); both of these grow to a large size, and are said to be very abundant, but owing to the great demand, and the want of legal restriction to prevent the cutting of saplings, it is becoming difficult to obtain good greenheart. It is to be hoped that the British colonies in the western hemisphere will follow the example of the East Indian empire, and introduce, ere it be too late, measures of conservancy and reproduction. Sir J. Hooker has urged this in strong terms. (*Kew Report*, 1877.)

French Guiana contains valuable forests, and produces "angelique" (*Dicorynia paraensis*), a timber much employed in naval dockyards.

Venezuela.—Humboldt mentions in his travels that the waters of the Lake Valencia had greatly decreased owing to the clearings of forest in the Aragua valley, near the northern coast of Venezuela. The Orinoco, the great water highway of Venezuela, is fringed in its lower course with magnificent evergreen forests. The most important trees of this republic are lignum vitæ (*Zygophyllum arboreum*), found chiefly on the coast, and "guayacan," used for cabinet work. Brazil wood is so common as to be generally used for fences. Cedar and ebony are also among the products. Venezuela is the home of the cow tree (*Galactodendron utile*), which yields large quantities of nutritious thick milky juice. The cocoa plant (*Theobroma Cacao*) is also a native of the north of South America, thriving vigorously with a maximum of humidity and a high temperature.

Ecuador contains great forests east of the Andes, where the climate is excessively humid. The export trade in 1874 amounted to £676,635, upwards of £500,000 being for cocoa, india-rubber, and cinchona bark. The bark of *Cinchona Calisaya* is no longer procurable; that of *C. succirubra* is exported.

Brazil.—The great empire of Brazil has forests covering an area half the size of Europe. For 2000 miles the river Amazon flows through Brazilian territory, and forms with its tributaries the only interruption in a rich level tract measuring 1200 miles from E. to W. and 800 from N. to S. covered with virgin forest. R. Spruce graphically describes the wonderful luxuriance of a forest on the Amazon.

> "As we ran along shore and gradually lessened our distance, I endeavored to trace out the species composing the forest, but, with the exception of the palms, of the trees with bipinnate foliage, and of a few with remarkable dome-shaped crowns, there was such an intermingling of forms that I in vain attempted to separate them; nor was there, among exogenous trees, any contour so striking as the twisted pyramid of our northern pines. When I entered the forest the confusion was still greater; for so much were the branches of adjacent trees interwoven, and so densely veiled in many cases with twiners and epiphytes, that only an indistinct view could be obtained of any individual tree, and it was only when sailing along the banks of the rivers that I saw so much of the trees in the inundated forest as to give me a clear idea of the outlines and general aspect of many of them."—*Jour. Linn. Soc.*, v. 3.

The productiveness of the Brazilian forests may be inferred from the fact that in the Paris Exhibition of 1873 were 300 different kinds of timber, many of them of great value both for naval and civil construction and for ornamental work. No plantations have yet been formed of these valuable woods, and fustic and Brazil wood are to be met with only at a distance from the coast. The most important woods of construction are —jacaranda (*Dalbergia nigra*), Brazil wood (*Cæsalpinia echinata*), ironwood (*Cæsalpinia ferrea*), cedar (*Cedrela brasiliensis*). But the Brazilian forests though rich in timber are richer still in gums, resins, drugs, dyes, and produce valuable for trade and manufacturing purposes. The great development of commerce in forest produce is illustrated by the export returns for 1871–72, viz.:—

	Tons.	£.
Caoutchouc	4723	750,000
Maté (Paraguay Tea)	9357	227,581
Cocoa	3125	150,929
Rosewood	...	105,100
Manioc flour	6960	35,813

Of dye stuffs the best are Brazil wood, fustic (*Maclura tinctoria*), red mangrove (*Rhizophora*), arnotto (*Bixa Orellana*); of drugs, sarsaparilla (*Smilax* sp.), ipecacuanha (*Cephaelis Ipecacuanha*), guarana (*Paullinia sorbilis*), jalap (*Exogonium Purga*), etc. Europe draws from Brazil its largest supply of caoutchouc. It is obtained from *Siphonia elastica* and *Hancornia speciosa*, trees growing in abundance in the provinces of Amazonas and Para, and so large has been the export that in some districts the supply begins to fail. *Copernicia cerifera*, the wax palm, is a most valuable tree,—the estimated annual production in wax and fibre is nearly £250,000 (official return). Brazil wood and Brazil nuts (*Bertholletia excelsa*) are among the largest exports.

Peru.—In the Montana region of Peru (that is, the extensive area stretching eastward from the Andes to the confines of Brazil) are vast forests, yielding in spontaneous abundance Peruvian bark, india-rubber, vanilla, copaiba, cinnamon, sarsaparilla, ipecacuanha, vegetable wax, etc., but the collection of produce and its transport through the sierra and coast regions to the ports are attended with much difficulty and expense. The region of cinchona trees lies between 19° S. and 10° N. lat., and between 2500 and 9000 feet elevation above the sea. In South America the miserable Governments of the cinchona districts have almost destroyed the inestimable boon with which a bountiful Providence has endowed them. Happily, in this case, the energy of such men as Markham, Spruce, and others has in great measure prevented a loss which would have been incalculable; for the cinchona plantations established in India, in Java, and in various other colonies give promise that Europeans will not in the future suffer from the thoughtless greed of the semi-civilized Governments of the Andine States.

Chili.—In the inner valleys of the Cordilleras there are estimated to be from 250,000 to 500,000 acres of virgin forest, containing trees of great dimensions.

Uruguay.—The "montes" of South and Central Uruguay form narrow fringes to the larger streams, and rarely exceed a few hundred yards in width. Seen from distant higher ground they resemble rivers of verdure meandering through the bare campos, from which they are sharply defined—the reason being that the wood only grows where it is liable to inundation. N. and E. Uruguay are little known, but the same description is applicable to them. In the montes of the Rio Negro, Dr. David Christison reports having seen twenty species of trees and shrubs, including a palm which extends southwards to the Santa Lucia. The montes of Uruguay are of no commercial value, and their extent must be trifling, but they suffice for the wants of the present scanty population. The beautiful ombu (*Pircunia* or *Phytolacca dioica*) is the only tree which is possibly native on the campos. The softness of its spongy tissue renders it useless for burning and for timber. On the eastern side of South America, continued in the whole stretch of 1500 miles south of the Rio de la Plata to the straits of Magellan, wood seems to be extremely rare, except a few thorny acacias in the plains of Patagonia, some willows on the banks of one or two of the rivers, and the antarctic beech and the Winter's bark tree—a great contrast to some of the islands of Tierra del Fuego, which, from the descriptions of Darwin, we know to be completely covered with forest.

AUSTRALIA.

The large continent of Australia, so far as it has been colonized, is emphatically a pastoral country, and no survey has yet been made of its surface bearing wood. There are vast tracts in the interior covered with *scrub*, but the total area of forest producing timber seems to be comparatively small. The growth of trees is more vigorous in the east than on the north and north-west coasts. The foliage is usually evergreen, and the leaves of many trees hang vertically. The chief forests occupy the flat margins of the rivers, and are composed of species of *Acacia* and *Eucalyptus* mingled with *Callitris* and *Casuarina*, *Banksia*, *Melaleuca*, *Xanthorrhæa*, and *Exocarpus*. The *Eucalyptus* and *Acacia* are said to compose four-fifths of the forests of Australia and Tasmania. These trees, formerly despised and thought of little value, are now introduced into many countries where artificial planting has been found necessary, and are extensively grown in India, Mauritius, Algeria, and Italy. The Eucalypti in particular possess many excellent qualities: their timber is of great durability, strength, and toughness; they are rapid in growth; and *E. Globulus*, or blue gum, is reputed to purify the surrounding air from malaria, and is frequently found 300–350 feet high, while *E. diversicolor* attains still larger dimensions. These, along with *E. resinifera*, iron bark tree, and *E. marginata*, Australian mahogany, "jarrah," are reported to be abundant in many parts of Australia. Other principal trees, chiefly in the east, are *Cedrela Toona*, or red cedar, *Gmelina Leichardti*, *Araucaria Cunninghamii*, or the Moreton Bay pine, and *Castanospermum australe*, or Moreton Bay chestnut. In Western Australia, amongst other forest trees of note, are the raspberry-scented acacia (*A. acuminata*) and sandalwood (*Fusanus spicatus*). A simpler system of forest management than the elaborate organizations of France, Germany, or Scandinavia is applicable to thinly peopled colonies. In the province of Victoria a State Forest Board was appointed in 1867, and maps have been prepared showing the distribution of the principal trees within its bounds, the proposed reserves, and the forest ranges. A Planting Encouragement Act was passed in 1872. By the formation of the board, with an inspector of forests to aid by advice, provision has been made for the preservation of existing woods and young plantations. The first annual report appeared in 1875, from which we find that the total area of reserves is 1805 square miles, estimated to contain 400,000 trees, yielding an average of 700 superficial feet. There is a large state nursery, and there has been great success in planting exotic trees, *Abies Douglasii*, *Cedrus Deodara*, *Sequoia gigantea*, *Cupressus torulosa*, etc. These measures have been introduced mainly by the energy of Baron von Müller, the Government botanist in Victoria. Attention is directed to the subject in other Australian colonies, where there is an equal call for action, and a beginning towards conservation has already been made in Queensland. Even firewood in some places is now scarce; and the demands for mining and various industrial pursuits render it needful to import timber from other countries.

South Australia.—Dr. R. Schomburgk reports in 1878 that three valuable forest trees have been successfully introduced, and are recommended to the forest board:—(1) the American ash, *Fraxinus Americana*, which has been largely grown in the forest reserves; (2) English elm, *Ulmus campestris*; and (3) the plane tree, *Platanus orientalis*. With regard to replanting the country with roadside trees and clumps, the individual enterprise of farmers, agriculturists, and landowners must be looked to.

In *Tasmania* the arboreous forms are similar to those of Australia. Eucalypti are even more abundant, and the acaciæ begin to disappear. It is remarkable that these two genera should be wholly absent in New Zealand. The vast forests of Western Tasmania are extensively utilized for timber. (See Bentham and Müller's *Flora of Australia* and Hooker's *Flora of Tasmania*.)

New Zealand.—One of the richest portions of the globe as regards arboreous vegetation is the colony of New Zealand. It enjoys a climate similar to that of the south of Europe; the vegetation is most luxuriant, and many tropical plants flourish, while conifers, characteristic of colder regions, also abound. In Britain the number of indigenous timber trees is only 35 out of a flora of 1400 species, while New Zealand has 113 timber trees in a flora of only about 1000 species. The most valuable tree of New Zealand is the kauri (*Dammara australis*), which grows only in the northern island. It attains the height of 120–160 feet and is 5–12 feet in diameter, is unrivalled for masts, and has long been exported to British dockyards for that purpose. The value for 7 years ending December, 1873, from Auckland of kauri alone amounted to £144,000, against £19,739 of all other timber. Besides timber, kauri resin, obtained in great masses, is exported. In ten years the value amounted to £1,171,949; the price varies from £33 to £39 per ton. Other valuable trees are totara (*Podocarpus totara*) and matai (*P. spicata*), both found throughout the colony, and, like the kauri, yielding timber of great durability and strength, and *Vitex littoralis*, or New Zealand teak, esteemed more lasting than any other native wood. There are several species of *Fagus*, forming beech forest, and many other trees yield valuable wood, as *Leptospermum ericoides*, the tea-tree, and *Santalum Cunninghamii*, sandalwood. The forest area in New Zealand was calculated to have been 20,370,000 acres in 1830, and 12,130,000 acres in 1873, by Dr. Hector. The public were permitted to fell in the forests on payment of a small license fee, and reckless unchecked felling has been the consequence. Such rapid deforesting of these densely wooded islands has naturally created an alarm in the legislature, and the Government in 1872 passed a Forest Planting Encouragement Act, offering a bonus for land cropped with trees. Several large plantations have been formed, and the Government has shown itself awake to the importance of the subject. In 1876 Captain Campbell Walker, an experienced officer of the Indian forest service, was requested to examine the resources of the New Zealand forests, and to propose a scheme of working them. His report was presented to both Houses of Assembly in 1877, and deserves the earnest attention of the New Zealand Government. In this richly wooded country clearings have been made with rapidity, and the great work now must be to preserve and propagate the valuable indigenous trees. An idea of the vastness of forest operations in New Zealand is derived from the fact that there are 125 steam or water-power saw-mills at work, turning out 103,039,037 superficial feet in 1876, and from each of these mills a tramway is laid down penetrating into the forests; the rails are generally of wood, and the haulage is by horses. It is understood that large forest tracts are to be demarcated and placed under the control of Government officers. In this way only can a regular system of forest management be carried out, and the temptation to obtain quick returns by sale of valuable forest avoided.

Africa.

A large extent of the continent of Africa is arid and treeless; the drought in the desert is so great that no tree can resist it. But many parts are now ascertained to be rich in wood, and recent discoveries by Baker, Livingstone, Cameron, and Stanley have opened up vast regions where much beautiful timber abounds. The Atlas Mountains are covered with magnificent forests, containing eight species of oak, *Pistacia*, *Acacia arabica*, *Cedrus atlantica*, closely allied to if not the same species as *C. Libani* and *Deodara*, and many other trees. To the south of the Atlas, on the borders of the great Sahara, are large tracts covered with date palms. The Sudan region has few trees; among these are the baobab (*Adansonia*), tamarind, sycamore, fig, the doom and oil palms, with a few thorny acacias.

Algeria.—The forests consist mainly of the Aleppo pine (*Pinus halepensis*), the cork oak (*Quercus Suber*), *Q. Ilex*, the Atlas cedar (*Cedrus atlantica*), and the Atlas cypress (*Callitris quadrivalvis*); associated with these are the *Quercus castaneæfolia*, *Q. ballota*, *Pinus Pinaster*, and other species. The forest area is thus distributed:—state forests, 4,657,567 acres; communal forests, 191,487; total, 4,849,054 acres. About two-thirds of this area is under the management of the forest service, the rest having been granted on long leases for cork production or olive culture. Cork is one of the most valuable of Algerian products, each tree yielding six to eight francs' worth at a stripping. A large amount of bark for tanning and 50,000 tons of alpha grass are exported from the province. Conservancy has not yet proved remunerative, but with the extension of railroads an increase of revenue is expected (Major Seaton). The consul-general for Algeria alludes in the following terms to the evils which have attended the deforesting of Tunis:—

> "Nothing is more certain than that forests and tracts of brushwood not only prevent the evaporation of moisture by protecting the surface of the earth from the sun's rays, but they serve to retain the light clouds which otherwise would be dissipated, until they attain sufficient consistence to descend in rain or refreshing mists. A hill side deprived of the forest whose foliage acted as a huge parasol to the ground, and whose roots served to retain the vegetable soil which was formed by its decay, very soon loses the power of generating vegetable life at all. The rich mould gets washed by winter rains into the valleys; in the summer months the sand is blown down on the top of this; succeeding rains carry down stones and gravel, till very soon all the most fertile portions of the soil disappear, leaving a residuum which is only capable of supporting vegetation when it becomes fertilized by an exceptional amount of moisture, which, as time progresses, must become rarer and rarer, like the efforts of the spendthrift to live off income, and spending every year a portion of his capital."—Colonel R. L. Playfair, *Travels in the Footsteps of Bruce in Algeria and Tunis* (1877, p. 155).

Tunis.—The African traveller Bruce 110 years ago alluded to the forests through which he passed, where not a tree is now to be seen. Dr. Shaw and Desfontaines the botanist mention the Aleppo pine and the making of pitch, but the wide plain over which they journeyed is now treeless, and the forest described by the latter in 1784 has quite disappeared.

Egypt, though possessing no forests, has a considerable amount of wood in acacia, lebbek, tamarisks, tamarinds, zizyphus, etc., and has also a rich property in its date palms, which grow in great abundance.

Abyssinia has extensive woods in the mountains, whence the coffee plant has spread over the world.

The tropical vegetation of Africa under the equatorial belt of rain is very luxuriant, and differs much on the two coasts. In the interior of Central Africa, Livingstone, Cameron, and Stanley tell us of vast tracts of primeval forest in the Manyuema country between Tanganyika and the coast, and also in Urungu south of Tanganyika, but as yet little is known of them in detail. The explorations of Nachtigal have shed much light on the regions adjoining Bornu, and Rohlfs describes gigantic tamarind, acacia, and komova trees. Stanley writes in glowing terms of the dense growth of lofty forests through which he had to cut his way, and specially refers to *Bassia Parkii*, or shea butter, which attains a large size, *Oldfieldia africana*, or African teak, kola nut (*Sterculia*), cashew nut, and gigantic tamarinds.

The western coast states—Congo, Sierra Leone, Senegambia—are all rich in wood, but comparatively little is known of the amount or of the value of the timbers, though some of these already find their way into European markets, in small quantities, viz., barwood or camwood (*Baphia nitida*), African mahogany (*Swietenia Senegalensis*), and African teak (*Oldfieldia africana*). The low-lying portions are malarious, where the mangroves and other swamp-loving trees abound. The baobab (*Adansonia digitata*), which grows also on the east coast and in Nubia, attains a large size, with a huge rapidly tapering trunk, and yields a strong fibre from the bark. From the compact green appearance of the foliage of a mass of baobab Cape de Verd is said to have received its name. The Guinea palm (*Elais guinensis*) abounds on the western coast, and England imports annually from Africa 10,000 tons of the palm oil. Valuable gums, as copal, etc., are also obtained from both the east and west coasts; and with the prospective opening up of Central Africa many valuable forest products will certainly come into commerce.

Ashantee may almost be described as one continuous forest, "composed of tall and massive trees, with creepers extending like cordage from one to another, and so matting the foliage together overhead that a green roof is formed almost impenetrable to the sun. Here and there are chinks and skylights through which the sun shoots in and falls upon the tree trunks and ground in gleams and splashes of crystal light. There is not much undergrowth, for that kind of vegetation cannot exist without sunshine, and in the virgin forest is always a kind of twilight" (Winwood Reade).

Lower Guinea.—Welwitsch describes forests extending 700 miles along the coast from the Congo to the Cunene River. These consist of *Diospyros*, *Cæsalpinieæ*, *Combretaceæ*, and *Celastrineæ*, the higher mountains behind being covered with extensive forests of the same families, with *Sterculiæ*, *Cynomatiæ*, and *Copaifera Mopane*, Benth. He saw ten miles exclusively covered with *Hyphæne cucifera*, Pers., and adds: "I conclude that these palm forests covered in past ages a great portion of the coast districts of Angola, where at present they only appear as dwarf bushes without stems, and never blossom." The only tree which braves the general dwindling is the *Adansonia*, which is seen in full splendor throughout the district. The export of gum copal from Benguela is about 1,600,000 lb. per annum. (*Jour. Linn. Soc.*, ix. 288.)

South Africa has suffered much from denudation, and according to the Colonial Botanists' reports many of its evil effects have followed, such as the frequent occurrence of sudden and destructive floods, and occasional droughts of extreme severity. But South Africa possesses a great variety of forest trees, yielding timber of great strength and beauty; they are, however, only found in mountain gorges and over a limited area. (Harvey and Sonder's *Flora Capensis.*)

Mauritius, with its insular position and humid climate, possessed a most luxuriant indigenous vegetation, reaching to the water's edge; but the aboriginal forests have disappeared, and the scarcity of wood for building and fuel has necessitated an annual outlay of £20,000 for imported timber. To supply the wants of the people, to provide shelter, and to improve the sanitary condition of the island, the local Government adopted measures some years ago for forming plantations on the higher elevations. The Australian eucalypti flourish well, and the planting around Port Louis has been attended with marked advantage to the town. (*Flora of Mauritius*, Baker.) Through the agency of fire and goats, supplemented by the rapid spread of introduced plants, the rich primitive forests of Rodriguez and St. Helena have likewise become extinct. (Hooker's *Insular Floras.*)

Madagascar has been celebrated for its luxuriant vegetation, and in the north and east, where the climate is moist, magnificent forests clothe the hills. Elsewhere vegetation forms a narrow belt along the shore. The Ravenala, or traveller's tree, is characteristic of the island. (Rev. W. Ellis, Rev. Dr. Mullens.)

From this sketch of the principal forest lands of the world it appears that, although the progress of civilization and the increase of population have greatly diminished the area of forests in many countries, they still cover a large portion of the earth's surface, and the necessity of maintaining them is now generally recognized. It is beyond doubt that these vast wooded tracts affect most powerfully the economy of the globe. The direct influences may be summarized from the results arrived at by Humboldt and others:—(1) By screening the soil from the heat of the sun's rays; (2) by the immense surface these leaves offer to the cooling process of radiation; and (3) by the copious evaporation of moisture from the leaves. Some of the indirect benefits which thus accrue from the presence of forests may be mentioned, such as the maintenance of equable temperature and humidity, the affording of protection and shelter, the control of the regular flow of rivers, and the supply of perennial springs which fertilize and beautify the country. It is the climatic and physical importance of a due proportion of wooded land, independent of the utility of forest products in innumerable arts which now contribute to our comfort and progress, that has at length awakened most of the civilized Governments to the necessity of protecting forests from ruthless spoliation. The following general conclusions adopted in 1851 by the British Association committee already referred to contain principles which, although limited in the first instance to British India, have been found more or less applicable to all countries:—

1. That over large portions of the globe there is still an almost uncontrolled destruction of the indigenous forests in progress, from the wasteful habits of the population.

2. That where conservancy has been introduced, considerable improvement has already taken place.

3. That these improvements may be extended by a rigid enforcement of the present regulations, and the enactment of additional provisions of the following character, viz.,—careful maintenance of the forest by valuation surveys and working plans, and by the preservation or plantation of seedlings in place of mature trees removed,—nurseries being established; prohibition of cutting until trees are well grown, with rare and special exceptions for peculiar purposes; and provision, in the case of trees yielding gums, resins, or other valuable products, that greater care be taken in tapping or notching the trees, most serious damage in some countries resulting from neglect in this operation.

4. That especial attention should be given to the preservation and maintenance of the forests occupying tracts unsuited for other culture, whether by reason of altitude or peculiarities of physical structure.

5. That in a country to which the maintenance of its water supplies is of extreme importance, the indiscriminate clearing of forests around the localities whence those supplies are derived is greatly to be deprecated.

6. That it is a duty to prevent the excessive waste of wood, the timbers useful for building and manufactures being reserved and husbanded.

7. That as much local ignorance prevails as to the number and nature of valuable forest products, measures should be taken to supply through the officers in charge information calculated to diminish such ignorance.

Necessity has caused the adoption of these principles in many lands of both the New and the Old World, and forestry will henceforth be studied as a science as well as practised as an art. It is manifestly of the greatest importance that, in the progressive development of great countries, just and enlightened principles should influence the views and actions of those who are charged with the duty of advising Government in regard to the material resources committed to their care for behoof of present and future generations.

For greater detail and more exhaustive treatment of the subject, the reader is referred to the following works in addition to those already alluded to:—GREAT BRITAIN. Selby, *A History of British Forest Trees*, 1842; Marsh, *The Earth as modified by Human Action*, 1874; Brown, *The Forester*, 1861; *Journal of Forestry*, monthly.—FRANCE. Mathieu, *Flore Forestière*, 1877; Jules Clavé, *Études sur l'Économie Forestière*, 1862; Nanquette, "*Cours d'Aménagement des Forêts*," 1868; *Annuaire des Eaux et des Forêts*; A. Parade-Lorentz, *Cours Élémentaire de Culture des Bois*, 1860; Becquerel, *Mémoire sur les forêts et leur influence climatérique*, 1868; Maury, *Les Forêts de la Gaule*, 1867; Croumbie Brown, *Reboisement in France*, 1876.—GERMANY. Leo, *Forst-Statistik über Deutschland und Oesterreich-Ungarn*, 1874; Schneider, *Forst- und Jagd-Kalender für das Deutsche Reich*; Fischbach, *Lehrbuch der Forst-wissenschaft*, 1865; Hartig, *Lehrbuch für Förster*, 1861; Judeich, *Die Forst-Einrichtung*, 1871.—SWITZERLAND. *Bericht an den hohen Bundesrath über die Hochgebirge Waldungen*, 1862.—ITALY. Di Berenger, *Studii di Archeologia Forestale*, 1863; *Raccolta delle Leggi Forestali*, 1866; Siemoni, *Manuale d'Arte Forestale*. (H. C.)

Forest Law.

One of the most cherished prerogatives of the king of England, at the time when his power was at the highest, was that of converting any portion of the country into a forest in which he might enjoy the pleasures of the chase. The earliest struggles between the king and the people testify to the extent to which this prerogative became a public grievance, and the charter by which its exercise was bounded (Charta de Foresta) was in substance part of the great constitutional code imposed by his barons upon King John. At common law it appears to have been the right of the king to make a forest where he pleased, provided that certain legal formalities were observed. The king having a continual care for the preservation of the realm, and for the peace and quiet of his subjects, he had therefore amongst many privileges this prerogative, viz., to have his place of recreation wheresoever he would appoint.[1] Land once afforested became subject to a peculiar system of laws, which, as well as the formalities required to constitute a valid afforestment, have been carefully ascertained by the Anglo-Norman lawyers. "A forest," says Manwood, "is a certain territory of woody grounds and fruitful pastures, privileged for wild beasts and fowls of forest, chase, and warren to rest, and abide there in the safe protection of the king, for his delight and pleasure; which territory of ground so privileged is mered and bounded with unremovable marks, meres, and boundaries, either known by matter of record or by prescription; and also replenished with wild beasts of venery or chase, and with great coverts of vert, for the succor of the said beasts there to abide: for the preservation and continuance of which said place, together with the vert and venison there are particular officers, laws, and privileges belonging to the same, requisite for that purpose, and proper only to a forest and to no other place."[2] And the same author distinguishes a forest as "the highest franchise of princely pleasure," from the inferior franchises of chase, park, and warren—named in the order of their importance. The forest embraces all these, and it is distinguished by having laws and courts of its own, according to which offenders are justiceable. An offender in a chase is to be punished by the common law; an offender in a forest by the forest law. A chase is much the same as a park, only the latter is enclosed, and all of them are distinguished according to the class of wild beasts to which the privilege extended. Thus, beasts of forest (the "five wild beasts of venery") were the hart, the hind, the hare, the boar, and the wolf. The beasts of chase were also five, viz., the buck, the doe, the fox, the marten, and the roe. The beasts and fowls of warren were the hare, the coney, the pheasant, and the partridge. (See GAME LAWS.)

The courts of the forest were three in number viz., the court of attachments, swanimote, and justice-seat. The court of attachments (called also the wood-mote) is held for the foresters to bring in their attachments concerning any hurt done to vert or venison (*in viridi et venatione*) in the forest, and for the verderers to receive and mark the same, but no conviction takes place. The swanimote is the court to which all the freeholders within the forest owe suit and service, and of which the verderers are the judges. In this court all offences against the forest laws may be tried, but no judgment or punishment follows. This is reserved for the justice-seat, to which the rolls of offences presented at the court of attachment, and tried at the swanimote, are presented by verderers. The justice-seat is the court of the chief justice in eyre, who, says Coke, "is commonly a man of greater dignity than knowledge of the laws of the forests; and, therefore, where justice-seats are to be held, some other persons whom the king shall appoint are associated with him, who together are to determine *omnia placita forestæ*." There were two chief justices for the forests *intra* and *ultra Trentam* respectively. The necessary officers of a forest are a steward, verderers, foresters, regarders, agisters, and woodwards. The verderer was a judicial officer chosen in full county by the freeholders in the same manner as the coroner. His office was to view and receive the attachments of the foresters, and to mark them on his rolls. A forester was "an officer sworn to preserve the vert and venison in the forest, and to attend upon the wild beasts within his bailwick." The regarders were of the nature of visitors: their duty was to make a regard (*visitatio nemorum*) every third year, to inquire of all offences, and of the concealment of such offences by any officer of the forest. The business of the agister was to look after the pasturage of the forest, and to receive the payments for the same by persons entitled to pasture their cattle in the forests. Both the pasturage and the payment were called "agistment."

The legal conception of a forest was thus that of a definite territory within which the code of the forest law prevailed to the exclusion of the common law. The ownership of the soil might be in any one, but the rights of the proprietor were limited by the laws made for the protection of the king's wild beasts. These laws, enforced by fines often arbitrary and excessive, were a great grievance to the unfortunate owners of land within or in the neighborhood of the forest. The offence of "purpresture" may be cited as an example. This was an encroachment on the forest rights, by building a house within the forest, and it made no difference whether the land belonged to the builder or not. In either case it was an offence punishable by fines at discretion. And if a man converted woodlands within the forest into arable land, he was guilty of the offence known as "assarting," whether the covert belonged to himself or not.

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[1] Coke, 4 *Inst.*, 300.

[2] Manwood's *Treatise of the Forest Laws*, 4th edition, 1717.

The hardships of the forest laws under the Norman kings, and their extension to private estates by the process of afforestment, were among the grievances which united the barons and people against the king in the reign of John. The Great Charter of King John contains clauses relating to the forest laws, but no separate charter of the forest. The first charter of the forest is that of Henry III., issued in 1217. "As an important piece of legislation," says Professor Stubbs,[1] "it must be compared with the forest assize of 1184, and with 44th, 47th, and 48th clauses of the charter of John. It is observable that most of the abuses which are remedied by it are regarded as having sprung up since the accession of Henry II.; but the most offensive afforestations have been made under Richard and John. These latter are at once disafforested; but those of Henry II. only so far as they had been carried out to the injury of the landowners and outside of the royal demesne." Land which had thus been once forest land and was afterwards disafforested was known as *purlieu*—derived by Manwood from the French *pur* and *lieu*, *i.e.*, "a place exempt from the forest." The forest laws still applied in a modified manner to the purlieu. The benefit of the disafforestment existed only for the owner of the lands; as to all other persons the land was forest still, and the king's wild beasts were to "have free recourse therein and safe return to the forest, without any hurt or destruction other than by the owners of the lands in the purlieu where they shall be found, and that only to hunt and chase them back again towards the forest without any forestalling" (Manwood, *On the Forest Laws*—article "Purlieu").

The revival of the forest laws was one of the means resorted to by Charles I. for raising a revenue independently of parliament, and the royal forests in Essex were so enlarged that they were hyperbolically said to include the whole county. The earl of Southampton was nearly ruined by a decision that stripped him of his estate near the New Forest. The boundaries of Rockingham Forest were increased from six miles to sixty, and enormous fines imposed on the trespassers,—Lord Salisbury being assessed in £20,000, Lord Westmoreland in £19,000, Sir Christopher Hatton in £12,000 (Hallam's *Constitutional History of England*, c. viii.). By the statute 16 Charles I. c. 16 the royal forests were determined for ever according to their boundaries in the twentieth year of James, all subsequent enlargements being annulled. (E. R.)

FORFAR, or ANGUS, a maritime county of Scotland, is situated between 56° 27′ and 56° 59′ N. lat., and between 2° 26′ and 3° 24′ W. long. It is bounded on the N. by the shires of Aberdeen and Kincardine, on the E. by the German Ocean, on the S. by the Firth of Tay, which separates it from Fife, and on the W. by Perthshire. Its greatest length from north to south is about 37 miles, and its greatest breadth from east to west 27 miles; its average length is about 35 miles, and its average breadth about 25 miles. The area comprises 890 square miles or 569,840 imperial acres.

Forfar presents great variety of surface. The northern division, comprising nearly half the county, is occupied by the Binchinnin hills or "Braes of Angus," which form part of the Grampian mountain range, and join the "Braes of Mar" in Aberdeenshire. At the head of Glen Clova they rise boldly and abruptly, and are clothed in summer by a green covering of grass; but for the most part they are rounded and rather tame, and covered with a thin coat of moorish soil bearing stunted heath. The highest summit is Glas Meal, 3502 feet, and a large number are over 3000 feet. The range is intersected by several wooded and fruitful valleys, the principal of which are Glen Isla, Glen Prosen, Glen Clova, Glen Lethnot, and Glen Esk. These are watered by streams that rise in the west and north, and commonly flow south-east, receiving the mountain torrents in their progress. Some miles south from the Grampians, and parallel to them, there is another and lower mountain range called the Sidlaw hills, the higher eminences generally covered with moor and heath, but the lower ridges cultivated or wooded. Their highest summits are Auchterhouse hill (1399 feet), and Gallow hill (1242); and a considerable number are above 1100 feet. The breadth of this range is from 3 to 6 miles. Between these two mountain districts lies Strathmore or the Great Valley, as the name means in Gaelic, or, as it is commonly called, the "Howe of Angus," forming a continuation of the "Howe of the Mearns," and having a breadth of from 6 to 8 miles,—a district beautifully diversified by gentle eminences, fertile fields, plantations, villages, and gentlemen's seats, very little of it being 200 feet above sea-level. From the Sidlaw Hills to the German Ocean on the east and the Firth of Tay on the south there extents a tract of low and level ground, varying in breadth from 3 to 8 miles, and comprehending about a fourth part of the whole county. The southern shore is level and sandy, but from Arbroath to Lunan Bay the coast line is formed of sandstone cliffs, in some parts very steep and precipitous, and containing a number of caves, most of which are only accessible from the sea.

The principal rivers are the Isla, the South Esk, and the North Esk. The Isla rises in the Grampians in the north-west of the county, and flows from north to south through the glen which bears its name, until at Ruthven it bends to the westward and joins the Tay in Perthshire. Below the Bridge of Craigs it has cut a chasm, in some places more than 100 feet in depth, through a barrier of porphyry and gravel stone rocks, where it forms cascades of singular beauty. The South Esk has its source in the Grampians a few miles east of the Isla, and flows south-east till it reaches the valley of Strathmore, after which it takes an eastward course, and passing Brechin discharges itself into the basin of Montrose. The North Esk issues from Loch Lee, and, flowing first eastward and then south-east, forms for about 10 miles of its course the boundary between this county and that of Kincardine, and falls into the sea about 3 miles north-east of Montrose. Among the smaller streams are the Dean, a tributary of the Isla; the Prosen, which falls into the South Esk; the Mark, the Westwater, and the Cruick, which join the North Esk; the Dighty, which flows south-eastwards into the Firth of Tay at Broughty Ferry; and the Lunan, which empties itself into the German Ocean at Lunan Bay. There are a number of small lochs, the principal being Loch Lee, Lintrathen Loch, and the lochs of Forfar, of Rescobie, and of Balgavies.

Geology and Minerals.—In the northern portion of the Forfarshire Grampians the prevailing rock is granite, some of it very beautiful, and containing in its cavities topazes and rock crystals called "cairngorms," from the mountain of that name in Aberdeenshire. Other portions of the Grampians are composed of micaceous schist and porphyry, dykes of the latter in some places intersecting the former. Laminated mica is found in veins in mica slate, and rock crystals are found in the beds of torrents. Lead was at one time wrought at Gilfianan, above the old castle of Invermark, in the upper part of the parish of Lochlee; and according to Edward, in his *Description of Angus* published in 1678, it yielded one sixty-fourth part of silver. It has also been wrought at Ardoch near Milden on the Esk. Limestone occurs in various parts of the Grampians, and jasper is frequently embedded in the micaceous schist. In the lower portions of the Grampians pudding-stone prevails, and afterwards sandstone. Clay marl is found both in Strathmore and the Sidlaw hills. Shell marl abounds in the beds of the various lochs, some of which have been partly or wholly drained to render it easy of access. The Sidlaw hills are chiefly composed of sandstone of various colors. Sandstone flags are quarried in large quantities on the hill of Balmashanner, in the moor to the south of Forfar, in the parish of Carmylie, and along the southern declivity of the Sidlaw hills. In this sandstone district lies the famous *Forfarshire fishbed*, containing the earliest known vestiges of vertebrate life.[2] In the maritime district there are numerous beds of red sandstone, which, however, are frequently intersected by whinstone and porphyry. The principal limeworks are in this division,—at Hedderwick near Montrose, and at Boddin in the parish of Craig.

Climate and Agriculture.—The climate differs considerably in various parts of the county; but is on the whole salubrious and favorable for agricultural pursuits. According to observations taken by Alexander Brown, LL.D., at Arbroath, for ten years, from March, 1868, to March, 1878, the mean of the barometer, reduced to sea-level and a temperature of 32° F., was 29·83 inches. The mean temperature was in spring 46°·1 F., summer 58°·3, autumn 47°·7, winter 39°·0. The mean annual rainfall was 29·8 inches. The average annual number of days whereon the wind was from the N. was 29, N.E. 15, E. 26, S.E. 28, S. 69, S.W. 36, W. 78, and N.W. 38, while 46 were calm. In

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[1] *Documents Illustrative of English History*, p. 338.

[2] See paper by James Powrie, F.G.S., F.R.S.E., in *Transactions of Edinburgh Geological Society* for 1870.

Strathmore, owing to the proximity of the Grampians, the rainfall is considerably greater than in the maritime district. In these two districts the harvests are nearly as early as in any other district of Scotland, but in many of the uplands they are often very late. The total area of arable ground in 1878 was 252,902 imperial acres, of which 95,448 were under corn crops, 51,396 under green crops, 81,415 under rotation grasses, 24,295 permanent pasture, and 348 fallow. There were 31,857 acres under wood. The principal wheat district is the valley of Strathmore and the neighborhood of Dundee and Montrose; and the yield is excelled by few districts in Scotland. Its acreage (9416 in 1878) has, however, as elsewhere in Scotland, been decreasing, while there has been a gradual increase in that of barley (31,593 acres in 1878). Oats, for which the soil generally is well adapted, are the principal crop, the acreage (1878) being 52,802. Potatoes are chiefly grown in the upland and maritime districts; the acreage was 16,479. As a large number of sheep and cattle are kept, turnips are very largely grown, their acreage being 33,953. The acreage under beans was only 1060. The system of rotation varies according to soil and situation. The five years' shift, at one time the most common, has of late been largely superseded by a seven-shift. The number of cattle in 1878 was 44,405, or an average of nearly 17·8 to every 100 acres under cultivation as compared with 23·6 for Scotland. Of these the number of cows and heifers in milk or in calf was only 11,452, and except in the vicinity of the towns there are no dairy farms. The polled Angus cattle are not so much bred in this their native district as in the neighboring county of Aberdeen. Shorthorns are now being largely introduced. A large number of Irish cattle are imported for winter feeding. Forfar has suffered more from contagious diseases than any other Scotch county. Their prevalence is thought by some to be partly due to the practice of letting grass and turnips to be consumed by the cattle of dealers and middlemen. The number of horses was 10,164 or an average of nearly 4 to every 100 acres under cultivation, just the average for Scotland. The most common breed is the Clydesdale, the small native *garrons* being now little used. The number of sheep was 122,798, an average of 50·1 to every 100 acres under cultivation, as compared with 149·3 for Scotland. The black-faced breed are the most common in the mountain districts, but their number has been much diminished of late years, owing to the large extent of country that has been converted into deer forests. Cross-bred lambs are bought in considerable numbers for winter-feeding in the lowland districts, and cross-bred ewes are kept on many farms for breeding. There are also a few flocks of pure-bred Border Leicesters, and some Shropshire downs and other varieties. The number of pigs was 5900, or an average of 2·3 to every 100 acres, as compared with 3·3 for Scotland.

In Forfar the holdings called crofts, of 10 acres and under, and those from 100 to 300 acres are the most common. A large number are between 10 and 100 acres, a considerable number between 300 and 500, and a few above 500. The general color of the soils in the lower districts is red, in other parts often inclining to dark-brown or black. The soil in the Grampians is generally moorish over white retentive clay, but loose, friable, and productive in the glens. Over the pudding-stone, in the lower grounds, it is sometimes thin, mossy, and encumbered with stones, and over the sandstone a tenacious clay often occurs, which, however, when properly cultivated, is very productive. The soil above whinstone is fertile though sometimes shallow. Along the coast there are large stretches of barren sand, but the soil of the district where cultivated is quick and very fertile. There is no great extent of peat; but nearly the whole of the northern division of the county is either waste land or occupied as sheep walks or deer forests. Farm management, except in the case of the crofts, is fully abreast of the times. Steam-cultivation is gradually increasing, and reaping machines are universally in use. Most farms possess excellent farm-houses and steadings, and covered courts for cattle are generally in use. Considerable progress has been made in the erection of suitable cottages for the farm servants, but bothies for unmarried servants are much too common in the county, and in these the accommodation provided is often of the rudest kind.

According to the owners and heritages return of 1872–73, the land, exclusive of Dundee, was divided between 4898 proprietors, holding land the gross annual value of which was £795,581, 7s. Of the owners 80 per cent. possessed less than one acre, and the average value all over was £1, 8s. 8¾ d. There were no fewer than 20 proprietors holding upwards of 5000 acres, viz., Earl of Dalhousie (Brechin Castle), 136,602; Earl of Airlie (Cortachy Castle), 65,059; Earl of Southesk (Kinnaird Castle), 22,525; Donald Ogilvie of Clova (Balnaboth), 21,893; Glamis Trustees (Glamis), 17,034; James Small (Brewlands), 10,300; Fotheringham Trustees (Fotheringham House), 8826; Helen C. Arbuthnott (Balnamoon), 8066; James T. Mackenzie, 7129; Hon. Mrs. E. Maule of Fearn, 6992; Lord Wharncliffe (Belmont Castle), 6926; Major W. Lyon, 6888; Earl of Camperdown (Camperdown House), 6770; Col. Ogilvy of Ruthven, 6336; Trustees of Charles Lyell, 5728; Sir Thomas Munro, Bart. (Lindertis), 5702; J. L. D. Stewart (Glenogil), 5524; Countess of Home, 5209; Lord John F. G. Hallyburton (Hallyburton House), 5199; Trustees of Robert Smith (Baharry), 5097.

There are extensive grouse and blackcock shootings on the moors; the roe deer is met with on the mountains, and the stag is also occasionally seen; the alpine hare is plentiful on the uplands; eagles tenant the cliffs of the Grampians; there are numerous waterfowl in the lochs; and otters and seals inhabit the eastern coast. Particulars regarding the botany of the county will be found in William Gardner's *Botany of Forfarshire.*

Manufactures and Trade.—The staple industry of Forfarshire is the manufacture of flax and jute, Dundee being the principal seat of the linen trade in Britain. Besides employing a large portion of the population of the burghs, linen in various forms is also manufactured at Kirriemuir, Coupar Angus, Carnoustie, Friockheim, Edzell, Lochee, Letham, Monifieth, and Newtyle. In some villages hand-loom weaving exists to a considerable extent. According to the census returns for 1871, the number of persons engaged in the different branches of the linen manufacture was 45,633, 15,418 males and 30,215 females. There are breweries, tanneries, and bleach-works in most of the towns. The herring, white fish, and salmon fisheries are pretty extensive. The number of herring boats connected with the Montrose district is upwards of 900, with a total estimated value of nearly £50,000.

The number of royal burghs, all of which are also parliamentary, is five, viz., Dundee, Arbroath, Brechin, Forfar, and Montrose. The other towns and the principal villages on the coast are—Broughty Ferry (5817), a watering place and suburb of Dundee; the manufacturing village of Monifieth (919); Carnoustie (3012), a watering place, but possessing also manufactures and fisheries; and the fishing villages of Auchmithie (412) and Ferryden (1395). Inland there are Coupar Angus (the larger part of which is, however, in Perthshire), Kirriemuir (4145), Friockheim (1129), Letham (953), Newtyle (542), and Edzell (415), all chiefly engaged in the linen manufacture. The total population of the county in 1871 was 237,567, of whom 106,324 were males and 131,243 females; the population in 1861 was 204,425. In the towns the population in 1871 was 186,185, in the villages 8203, and in the rural districts 43,179, as compared with 149,309, 6602, and 48,514 respectively in 1861.

One member of parliament is returned by the county, two by the burgh of Dundee, and the other burghs unite with Inverbervie in Kincardineshire in returning a third.

History and Antiquities.—Forfar belongs to that portion of Scotland inhabited in the time of the Romans by the Picts. The county is supposed by some to have received the name Angus from being granted to a son of one of the Scottish kings who bore that name; but others trace the origin of the title to a Gaelic designation for a particular kind of hill, and connect its use with the hill of Angus, to the east of the church of Aberlemno. It is only a few centuries ago that the name Forfar, borrowed from the county town, was applied to the whole county. In ancient times the county was governed by hereditary earls, and it was made an hereditary sheriffdom by David II. The principal historical events, not connected immediately with the burghs are the supposed Roman battle of the Grampians; the battle of Egfrid, king of Northumbria, and Bridei, king of the Picts, near Dunnichen, in 685, in which the former was slain; battles with the Danes at Aberlemno and other places; the defeat of Elpin, king of the Scots, by Ængus, in the parish of Liff, in 730; a battle between the Picts and Scots near Restinoth, about the year 835; and the defeat of Lord Montfort near Panmure by the earls of Fife and March about the year 1336.

In various parts of the county pretty entire remains of the "weems," or old subterranean dwellings of the Celts, are found; traces of Roman camps are very common; there are a large number of stone forts, and there are vitrified forts at Finhaven, at Dumsturdy Muir, and on the hill of Laws, near Monifieth. Spear heads, battle-axes, sepulchral deposits, Scandinavian bronze pins, gold bullets (used for coin), and other antiquarian remains are frequently met with. There are sculptured stone pillars at Aberlemno, Auldbar, Glammis, Kirriemuir, St. Vigeans, and other places. The principal ecclesiastical antiquities are connected with the burghs. Among the old castles may be mentioned the roofless square tower of Redcastle, at the mouth of the Lunan; the old tower of the modern castle of Guthrie; the tower of the castle of Auchinleck; the stronghold of Inverarity, near Kirriemuir; the large square keep of Broughty castle; the ruins of the castle of Finhaven; the two towers of the old Edzell castle; the ruins of Melgund castle, which are in a pretty entire condition; the ancient part of the splendid castle of Glammis; the small castle of Newtyle; the old square tower and gateway of the castle of Craig; and the remains of the old castle of Airlie, whose burning by the earl of Argyll in 1640 gave rise to the ballad of "The bonnie house of Airlie." The number of fine modern residences is too great to admit of their being here particularized.

The principal works on Forfarshire are Edward's *Description of Angus*, published in 1678, and reprinted in 1791; *Forfarshire Illustrated*, 1843; Gardner's *Botany of Forfarshire;* and *Memorials of Angus and the Mearns*, by Andrew Jervise, 1861.

FORFAR, a royal and parliamentary burgh of Scotland, and capital of the county of the same name, is situated in the valley of Strathmore near the railway from Aberdeen to Perth. The principal buildings are the court-house, the town-hall, the county buildings and the infirmary. The staple industry is the linen manufacture, but there are also breweries and tanneries. Forfar is of considerable antiquity, having been constituted a burgh before 1300. It was at one time the residence of royalty; and in the accounts of the chamberlain of the royal household, in the reign of Alexander III., and of some preceding monarchs, a charge is entered for the king's gardeners at Forfar. The town was protected by a castle which stood on a mound on the north side. Its origin is uncertain, but it is believed to have been the place where, in 1057, the first parliament of Malcolm Canmore assembled after the defeat of Macbeth. It was occupied and strongly garrisoned by the English in the beginning of the 14th century; but in 1307 Bruce, on his way through Angus, captured and destroyed it, putting the English to the sword. Its site is now marked by the town cross. It appears that the weekly market-day previous to the reign of James VI. was Sunday, when it was changed by Act of Parliament to Friday. In 1661 a special commission was appointed by the crown to try several parties accused of witchcraft, some of whom were condemned to be burnt. The bridle which was put into their mouths in leading them out for execution is still preserved in the burgh. Further, it is recorded that John Ford, for his services as a "witch ricker," was on the same occasion admitted a burgess along with Lord Kinghorn. Previous to the middle of last century, the town possessed very few houses of two stories; and notwithstanding its proximity to good gray slate quarries, the houses were almost all thatched. This burgh unites with Montrose, Arbroath, Brechin, and Inverbervie in sending one member to parliament. The population of the burgh (royal and parliamentary) in 1861 was 9258, and in 1871, 11,031.

FORGE, a fire urged by a blast for the purposes of the smith. Of late years many improvements have been made in its construction. Formerly the forge was almost made entirely of bricks, and many so constructed exist still. From the attention of engineers having been called to the special requirements and increasing wants of the day, the old forge has undergone many changes. Undoubtedly these changes are for the better. The modern forge leaves little to be desired. It is only in cases where the metal is of small dimensions, and the work of rare occurrence, that the old method of building them in brick is still resorted to. The forge seen in country smithies and in small shops is made entirely of bricks. It is generally built against a wall upon arches to a convenient height. The hearth, which should be made with fire-bricks, is sunk to a depth of three inches or more, according to the nature of the work for which it is constructed; so that the upper and outer course of brickwork forms a rim. About 2 feet 6 inches, more or less, above the hearth is placed the hood. This is also made of brick, and is built upon a flat iron rim. It is cone shape, and at the apex is an orifice leading into a flue for the escape of the smoke. In front of the forge is placed a water tank for quenching the work, tools, etc. The tuyere or tweer is placed at the back of the hearth, as well as a small watertank for keeping the nozzle from burning under the action of the severe heat to which it is submitted. A pair of bellows, either single or double, worked by a rocking staff or lever is placed on one side of the forge in a convenient position. The bellows are placed on each side, if the forge be provided with two fires; when this is the case it is called a double forge. Modern or the latest constructed forges are made almost entirely of cast or wrought iron. The wrought iron forges are as a rule portable for the purpose of ships, dockyards, etc. They are constructed with sheet iron of a suitable gauge, the pieces being riveted together, and generally have the bellows placed underneath the hearth so that it may be out of the way. This particularly applies to portable forges of any description. Cast iron forges (either single or double) are cast in one or two pieces, and are of superior thickness, so as to give strength and solidity. They are used as fixed hearths in shops. They are bricked up when the work is of a very heavy nature so as to support the weight. The hoods of these forges are also made of cast iron, and are bolted on to the main casting. They vary in shapes and sizes. Messrs. Handyside of Derby have designed some which have found much favor in the English Government and other works. Some of the smaller forges are now fitted with a fan blast—to be worked by hand. These are very powerful, and give a very uniform current of air. They also have the advantage of being made entirely of metal, which adds considerably to their strength and lightness. The exertion in blowing is much less with them than with the ordinary bellows, from the motion being circular and the fan running between centres. At the Paris Exhibition (1878) there were several forges constructed upon an improved method. The blast was obtained by a pump, a reservoir being attached for maintaining the current—which was very easy to keep up.

In large smithies the hearths are all placed in a row or scattered about the shops in convenient situations, each having a flue passing through the roof. They are worked by a powerful air blast situated at one end of the building. The air is conveyed by a series of main pipes sunk to the depth of a few feet under the ground. Smaller tubes are employed to convey the blast to the hearths. Under these circumstances the smith has but to turn a small lever, in order to open or close the air-valve which is placed in a small standard at the side of each hearth. By this means the workman is saved much labor and consequenty much time. Steam has also been adopted as a means of forcing air into the forge. With special apparatus for drying the steam it is very successful. It is, however, more adapted to large blast furnaces than those of the smithy. Another description of the forge is the battery forge. This is used in military service. It is constructed somewhat like a caisson. The bellows are situated in the place usually occupied by the ammunition chests. A box to contain coal, a set of tools, horse shoes, iron, and steel is attached to the body of the carriage, which is mounted on a pair of wheels.

The forge gives its name to "Forging," one of the most important arts connected with engineering work. The strength and durability of engines and other machinery in general depends to a very great extent upon the art and care bestowed upon those parts which have to sustain great weight, much strain, and an amount of wear and tear. Thus the smith holds in engineering shops a very important place. He has to depend upon his eye and judgment in many cases where the fitter and turner is assisted by drawings setting forth every detail. The smith, however, of the present day is not such an adept as his predecessor. The introduction of the steam hammer, stamps, etc., have to a great extent rendered his work nothing more than mechanical. To meet the urgent requirements of the present day, he has to study the engine and machine; that he has succeeded is evident, and the manufacturer can produce more work in less time than he could formerly. But though this is undoubtedly a gain, it has unfortunately been the means of rendering skilled manual labor in many branches of our industries almost superfluous. This being the case, the skill on which the older workmen so much prided themselves is slowly disappearing, and indeed has become almost extinct.

One great change in the history of forging was the introduction of the steam hammer in 1833 by Mr. Nasmyth. By the means of that machine, the welding and forging of pieces of metal of any size have become comparatively easy. Mr. Nasmyth's steam hammer has been improved upon by himself from that time, and is now to be seen in almost all engineering shops throughout the world. The tilt hammer is still in use, and for various purposes may be said to be of great utility. But the smaller sizes of steam hammer are more convenient and manageable, and as a natural consequence are rapidly taking its place. To the steam hammer we are indebted for the Y anvil, which is used in the forging of rods and bar iron. Rolling mills are, however, much quicker, and are used in preference.

A forging machine, invented by Mr. Ryder many years back, and still in full operation, possesses many qualities unattainable by any other known means. It consists of a series of small anvils of various sizes. These are held by set screws passing through the frame of the machine, which allow of the anvils being raised or lowered, so that a perfect adjustment might be obtained. The hammers are placed over the anvils, and work up and down in bearings, moved by an eccentric. This is worked by a cradle upon the head; the hammer is raised by a strong spiral spring. The strokes made by this machine vary from 600 to 1200 per minute. According to Mr. Platt (of Platt Brothers, Oldham), one of the original makers of the machine, it is rather a squeeze than a blow which does the work. Many improvements have been added to it by Mr. Platt's firm; and the Bolton blacksmith, as it is commonly called, is now being extensively used in the Government workshops for the manufacture of bayonets, etc. The tools used are wedge-shaped, and the surface of the iron after forging, or rather squeezing, is said to be anything but hard or difficult to file up. The spindles of mules (cotton-spinning machines) are now forged by this tool, and indeed every description of small work. The contour produced by it is such that the work is almost as true as though it had been surfaced in the lathe. There have been several other machines upon Ryder's principle brought out, but none appear to answer so well as that designed by the original inventor.

Another invention, the steam stamp, is now most extensively used. This is similar to a steam hammer; in place of the anvil and hammer head is placed a pair of dies, in which is cut the form of work necessary. The iron is placed over the die, the stroke is delivered, and the iron is forced into the shape of the die. Machinery and separate tools are now often forged in this hammer.

The quality of the coals used in forging is of the utmost importance; the coal preferred by smiths is that which makes plenty of coke, and which leaves after being burnt a quantity of white ashes.

The art of forging is by no means easy to acquire. Great practice is necessary to arrive at excellence in this important branch of our great industries.

See *The Forge* (published by the Society for the Propagation of Christian Knowledge), W. Harrison's *Light of the Forge*, and *The Smith's and Metal Worker's Director*. (D. A. A.)

FORGERY, in English law, is defined as "the fraudulent making or alteration of a writing to the prejudice of another man's right," or "as the false making, or making *malo animo*, of any written instrument for the purpose of fraud or deceit." This definition, it will be seen, comprehends all fraudulent tampering with documents. "Not only the fabrication and false making of the whole of a written instrument, but a fraudulent insertion, alteration, or erasure, even of a letter, in any material part of a true instrument whereby a new operation is given to it, will amount to forgery,—and this though it be afterwards executed by another person ignorant of the deceit" (Russell on *Crimes and Misdemeanors*, vol. ii. p. 619). Changing the word Dale into Sale in a lease, so that it appears to be a lease of the manor of Sale instead of the manor of Dale, is a forgery. And when a country banker's note was made payable at the house of a banker in London who failed, it was held to be forgery to alter the name of such London banker to that of another London banker with whom the country banker had subsequently made his notes payable. As to the fraud, "an intent to defraud is presumed to exist if it appears that at the time when the false document was made there was in existence a specific person, ascertained, or unascertained, capable of being defrauded thereby; and this presumption is not rebutted by proof that the offender took or intended to take measures to prevent such person from being defrauded in fact, nor by the fact that he had or thought he had a right to the thing to be obtained by the false document" (Stephen's *Digest of the Criminal Law*, c. 43). Thus when a man makes a false acceptance to a bill of exchange, and circulates it, intending to take it up and actually taking it up before it is presented for payment, he is guilty of forgery. Even if it be proved as a matter of fact that no person could be defrauded (as when A forges a cheque in B's name on a bank from which B had withdrawn his account), the intent to defraud will be presumed. But it would appear that if A knew that B had withdrawn his account, the absence of fraudulent intention would be inferred. A general intention to cheat the public is not the kind of fraud necessary to constitute forgery. Thus if a quack forges a diploma of the college of surgeons, in order to make people believe that he is a member of that body, he is not guilty of forgery. The crime of forgery in English law has been from time to time dealt with in an enormous number of statutes. "Mr. Hammond, in the title Forgery of his *Criminal Code*, has enumerated more than 400 statutes which contain provisions against the offence" (Sir J. T. Coleridge's notes to Blackstone). Blackstone notices the increasing severity of the legislature against forgery, and says that "through the number of these general and special provisions there is now hardly a case possible to be conceived wherein forgery that tends to defraud, whether in the name of a real or fictitious person, is not made a capital crime." These Acts were consolidated by 1 Will. IV. c. 66, now repealed. The later statutes, fixing penalties from penal servitude for life downwards, were consolidated by the 24 and 25 Vict. c. 98 (the Forgery Act). It would take too much space to enumerate all the varieties of the offence with their appropriate punishments. The following condensed summary is based upon chapter xxiv. of Sir J. Stephen's *Digest of the Criminal Law*.

1. Forgeries punishable with penal servitude for life as a maximum are—

(*a*) Forgeries of the Great Seal, Privy Seal, etc.

(*b*) Forgeries of transfers of stock, India bonds, exchequer bills, bank-notes, deeds, wills, bills of exchange, etc.

(*c*) Obliterations or alterations of crossing on a cheque.

(*d*) Forgeries of registers of birth, etc., or of copies thereof and others.

2. Forgeries punishable with fourteen years' penal servitude are—

(*a*) Forgeries of debentures.

(*b*) Forgeries of documents relating to the registering of deeds, etc.

(*c*) Forgeries of instruments purporting to be made by the accountant general and other officers of the Court of Chancery, etc.

(*d*) Drawing bill of exchange, etc., on account of another, per procuration or otherwise, without authority.

(*e*) Obtaining property by means of a forged instrument, knowing it to be forged, or by probate obtained on a forged will, false oath, etc.

3. Forgeries punishable with seven years' penal servitude:—Forgeries of seals of courts, of the process of courts, of certificates, and of documents to be used in evidence, etc.

Forgery of trade marks is a misdemeanor punishable with two years' imprisonment. (E. R.)

FORGET-ME-NOT, or SCORPION GRASS (German *Vergissmeinnicht;* French, *grémillet, scorpionne*), the name popularly applied to the small annual or perennial herbs forming the genus *Myosotis* of the natural order *Boraginaceæ*, so called from *μύς*, a mouse, and *οὖς*, an ear, on account of the shape of the leaves. The genus is represented in Europe, North Asia, North America, and Australia, and is characterized by oblong or linear stem-leaves; flowers in terminal scorpioid cymes (see BOTANY, vol. iv. p. 113, fig. 169); small ebracteate blue, pink, or white flowers; a five-cleft persistent calyx; a salver or funnel-shaped corolla, having its mouth closed by five short scales; and hard, smooth, and shining nutlets. The common or true Forget-me-not, the Water Myosote, *M. palustris*, With., is a perennial plant growing to a height of 6 to 18 inches, with rootstock creeping; stem clothed with lax spreading hairs; leaves light green, and somewhat shining; buds pink, becoming blue as they expand; corolla rotate, broad, with retuse lobes, and bright blue with a yellow centre. The divisions of the calyx extend only about one-third the length of the corolla, whereas in the other British species of *Myosotis* it is deeply cleft. The forget-me-not, a favorite with poets, and the symbol of constancy, is a frequent ornament of brooks, rivers, and ditches, and, according to an old German tradition, received its name from the last words of a knight who was drowned in the attempt to procure the flower for his lady. It attains its greatest perfection under cultivation, and, as it flowers throughout the summer, is used with good effect for garden borders. A variety, *M. strigulosa*, is more hairy and erect, and its flowers are smaller. The species *M. versicolor* bears both blue and yellow flowers.

FORKEL, Johann Nikolaus (1749–1818), was a native of Coburg in Saxony. As a practical musician, especially as a pianoforte player, Forkel achieved some eminence in his profession; but his claims to a more abiding name rest chiefly upon his literary skill and deep research as a writer and historian in the department of musical science and literature. He obtained the degree of doctor in philosophy, and for some time held the appointment of director of the music at the university of Göttingen. The following is a list of his principal works:—*Ueber die Theorie der Musik*, Göttingen, 1774; *Musicalis Kritische Bibliothek*, Gotha, 1778; *Allgemeine Geschichte der Musik*, Leipsic, 1781. The last is his most important work. He also wrote a *Dictionary of Musical Literature*, which is full of valuable material.

FORLÌ, the ancient *Forum Livii*, a city of Italy, at the head of a province which was formerly a legation of the Papal States. It is situated in a fertile plain between the Montone and the Ronco, a little to the right of the railway line between Rimini and Bologna, about 50 miles S.E. of the latter city. It is a well-built and flourishing town, with broad streets and a central piazza, which was reckoned one of the finest in Italy, but has been completely modernized in 1873. The cathedral is of special interest for the chapel of the Madonna del Fuoco, so called from the long-labored masterpiece of Carlo Cignani; and the church of S. Girolamo contains frescoes said to be by Melozzo da Forlì, the Conception by Guido Reni, and a beautiful tomb erected for a Barbara Ordelaffi of the 15th century. From most of the other churches the paintings have been removed to the *pinacoteca* or picture-gallery in the convent of the Frati della Missione, where, besides Melozzo and Cignani, Palmezzano, Guercino, Guido Reni, and Zanganelli are represented. The citadel, known as Rocca di Ravaldino, was founded in 1361 by Cardinal Albornoz; it is in great measure destroyed, and what still remains is utilized as a prison. Besides its administrative and ecclesiastical offices, the town possesses a chamber of commerce and arts, a public library, and several institutions for higher education. A considerable trade is carried on in the varied agricultural produce of the neighborhood, and there are manufactures of silk ribbons, and twist, of oil-cloth, nitre, wax, matches, and tiles. The population in 1872 was 15,324.

Forlì is said to have been founded either by Livius Salinator or by Lucius Arminius, after the defeat of Hasdrubal on the Metaurus in 207 B. C., but its name does not appear in Strabo or Ptolemy. After the fall of the Roman empire it became a republic, and had authority, it is said, over no fewer than 5 cities and 40 towns and villages. It stood a long siege from the French in 1287, and remained independent till 1315. During the troublous times of the 14th and 15th centuries the Ordelaffi, the Orgogliosi, and other powerful families were in possession of the lordship, which finally came to Pope Julius II. in 1503. In 1521 a battle was fought in the neighborhood by the French and the Spaniards. On the occupation of the country by the republicans in 1797 the town was made the head of the department of the Rubicon. A considerable number of eminent men are natives of Forlì:—Cornelius Gallus, the Latin poet; Guido Bonate, the astrologer; Melozzo, the painter (see next article); and Morgagni, the founder of pathological anatomy, born in 1682. Cignani and Torricelli are both buried in the cathedral.

FORLÌ, Melozzo da (c. 1438–1494), an eminent painter, particularly renowned as the first who practised foreshortening with much success. He was born, as his ordinary designation indicates, at Forlì about the year 1438; he came of a wealthy family named Ambrosi. In all probability, Melozzo studied painting under Piero della Francesca, of Borgo S. Sepolcro; he seems also to have been well acquainted with Giovanni Santi, the father of Raphael. It has been said that he became a journeyman and color-grinder to some of the best masters, in order to prosecute his studies; this lacks confirmation. Only three works are now extant which can safely be assigned to Melozzo. (1) He painted in 1472 the vault of the chief chapel in the church of the Apostoli in Rome, his subject being the Ascension of Christ; the figure of Christ is so boldly and effectively foreshortened that it seemed to "burst through the vaulting;" this fresco was taken down in 1711, and the figure of Christ is now in the Quirinal Palace, not worthy of special admiration save in its perspective quality; while some of the other portions, almost Raphaelesque in merit, are in the sacristy of St. Peter's. (2) Between 1475 and 1480 he executed a fresco, now transferred to canvas, and placed in the Vatican picture-gallery, representing the appointment of Platina by Pope Sixtus IV. as librarian of the restored Vatican library,—an excellent work of dignified portraiture. (3) In the Collegio at Forlì is a fresco by Melozzo, termed the "Pestapepe," or Pepper-grinder, originally painted as a grocer's sign; it is an energetic specimen of rather coarse realism, now so damaged that one can hardly assess its merits. Melozzo also painted the cupola of the Capuchin church at Forlì, destroyed in 1651; and it has been said that he executed at Urbino some of the portraits of great men (Plato, Dante, Sixtus IV., etc.) which are now divided between the Barberini Palace and the Campana collection in Paris; this, however, appears to be more than doubtful, and it is even questionable whether Melozzo was ever at Urbino. In Rome he was one of the original members of the academy of St. Luke, founded by Sixtus IV. He returned to Forlì, probably towards 1480, and died in November, 1494. He contributed sensibly to the progress of pictorial art; and, without being remarkable as a colorist gave well-graded lights, with general care and finish, and fine dignified figures. His works bear a certain degree of resemblance to those of his contemporary Mantegna. Marco Palmezzano was his pupil; and the signature "Marcus de Melotius" on some of Palmezzano's works has, along with the general affinity of style, led to their being ascribed to Melozzo, who has himself been hence incorrectly called "Marco Melozzo."

FORLIMPOPOLI, a town of Italy, about five miles east of Forlì, with a station on the railway between Bologna and Rimini. It was once a bishop's seat, and still possesses a cathedral and an ancient castle. The name and the situation identify it with one of the three places that bore the Latin designation of Forum Popilii. Its history is marked by great vicissitudes. Destroyed by the Lombards and restored by the people of Forlì, it was again laid utterly waste in 1370 by Cardinal Egidio, and though twenty years later it was refounded and refortified by Sinbaldo Ordelaffi, it never recovered its former prosperity. Population in 1872 about 5000.

FORMAN, Simon (1552–1611), a physician and astrologer, was born in 1552 at Quidham, a small village near Wilton, Wiltshire. At the age of fourteen he became apprentice to a druggist at Salisbury, but at the end of four years he exchanged this profession for that of a schoolmaster. Shortly afterwards he entered Magdalen College, Oxford, where he studied chiefly medicine and astrology. After continuing the same studies in Holland he commenced practice as a physician in Philpot Lane, London, but as he possessed no diploma, he on this account underwent more than one term of imprisonment. Ultimately, however, he obtained a diploma from Cambridge university, and established himself as a physician and astrologer at Lambeth, where he was consulted, especially as a physician, by many persons of rank, among others by the notorious countess of Essex. He expired suddenly while crossing the Thames in a boat, September 12, 1611.

A list of Forman's works on astrology is given in Bliss's edition of the *Athenæ Oxonienses;* many of his MS. works are contained in the Bodleian Library, the British Museum, and the Plymouth Library. *A Brief Description of the Forman MSS. in the Public Library, Plymouth,* was published in 1853.

FORMEY, Johann Heinrich Samuel (1711–1797), a German author, was born of French parentage at Berlin, 31st May, 1711. He was educated for the ministry, and at the age of twenty became pastor of the French church at Brandenburg. Having in 1736 accepted the invitation of a congregation in Berlin, he was in the following year chosen professor of rhetoric in the French college of that city, and in 1739 professor of philosophy. On the organization of the academy of Berlin in 1744, he was named a member, and in 1748 became its perpetual secretary. He died at Berlin on the 7th March, 1797. His principal works are *La Belle Wolfienne*, 1741–1753, 6 vols. 8vo, a kind of novel written with the view of enforcing the precepts of the Wolfian philosophy; *Bibliothèque Critique, ou Mémoires pour servir à l'Histoire Littéraire Ancienne et Moderne*, 1746; *Le Philosophe Chrétien*, 1750; *L'Émile Chrétien*, 1764, intended as an answer to the *Émile* of Rousseau; and *Souvenirs d'un Citoyen*, Berlin, 1789. He also published an immense number of contemporary memoirs in the transactions of the Berlin Academy, and besides founding and editing several periodical publications contributed largely to others. He enjoyed a considerable reputation for ability and learning during his lifetime, but his works, which display a varied but somewhat superficial erudition, are now almost forgotten.

FORMIA (formerly *Mola Gaëta* or *Castelmola*), a town of Italy, in the province of Caserta, beautifully situated near the ancient *Via Appia*, on the innermost recess of the Gulf of Gaëta. The surrounding country is occupied with vineyards, olive plantations, and fruit gardens. Formia occupies the site of the ancient Formiæ, said to have been founded by the Tyrrhenians. At an early period it received the Roman franchise and became a municipium. Villas were built near it by many of the noble Romans; and in the grounds of the Villa Caposele there are ruins which are thought by some to have been the baths of the villa of Cicero. The villa Caposele was at one time one of the residences of the kings of Naples. The vine of the Formian hills produced excellent wine in the time of Horace. Population in 1871, 9151.

FORMOSA, in Chinese *Taiwan*, a large island in the Pacific lying between what the Chinese call Nan-hai and Tong-hai, or the Southern and the Eastern Sea, and separated from the Chinese mainland by the strait of Fokien, which has a width of about 91 miles in its narrowest part. It extends from 121° 15′ to 122° 5′ E. long.; Foki, its most northern point, lies in 25° 19′, and its most southern, Lin-hai-shan or South Cape, in 21° 54′ N. lat. Its area is estimated at 14,978 square miles, or about half the size of Ireland. It forms part of the long line of islands which, in the words of Mr. Bridge, are interposed as a protective fortification between the Asiatic coast and the broad expanse of the Pacific, and produces that happy immunity from the typhoon which is enjoyed by the ports of China from Amoy to the Yellow Sea. A chain of mountains, called simply Ta-shan or Great Mountain by the Chinese, traverses the island from N. to S. and attains in several of its summits no inconsiderable elevation. The loftiest point is usually said to be Mu Kang-shan or the "Wooded Mountain," which has been named Mount Morrison by the English, "after the captain of one of the early vessels trading to Taiwanfu," and is said to be 12,850 feet in height; but it is not improbable that this estimate is too high, and that the range really culminates elsewhere. Towards the north the English maps show a Mount Sylvia or Shan-chas-shan, 11,300 feet high, and a summit in the Middle, Western, or Dodds range, 12,800 feet. Be this as it may, Formosa, as far as its vertical relief is concerned, is divided into three regions,—the mountains proper, the broad western versant with its alluvial plains, and the narrow eastern versant terminating in a high and precipitous coast. The formation of the island appears to have been due in part at least to volcanic agency; the Chinese accounts mention a mountain called Ho-shan or Fire Mountain, said to be a small volcano about 20 miles south of Kagee; and European explorers have described the jets of steam and sulphur-springs which occur among the calcareous rocks near Tam-sui. Coal, sulphur, and petroleum are the only mineral productions of Formosa which are known to exist in quantities sufficient to make them of economical importance. The principal coal-fields are in the north of the island, near Kelung and Tam-sui; and the coal is all shipped in Kelung harbor. Till 1877 mining operations were conducted after the simple Chinese fashion; but in that year Mr. Tyzack, an English engineer, engaged by the Chinese Government, opened a pit with a regular shaft 300 feet deep, and all the necessary machinery and engines for the proper working of the mine. The bed of coal is 3 feet thick. The mineral is highly bituminous, and burns very fast, but can be used for steamers on short voyages. It is regularly employed by many foreign vessels, as well as in the Chinese men-of-war, and in the arsenal at Fuh-chow. In 1873, 45,000 tons were shipped in foreign ships; in 1874, 15,221 tons; in 1875, 27,665 tons; and in 1876, 31,593 tons. In the plains the soil is generally of sand or alluvial clay, covered in the valleys with a rich vegetable mould. As might be inferred from what has been already said, the streams that flow eastward are little better than torrents; but the western region is traversed by several rivers of moderate development—the Taiwanfu and Pakan rivers, the Black river, the Lokan, the Taika, the Heon-lang, the Tion-kan, the Tonk-shan, and the Tam-sui. Of these the Black river is the widest, but the Tam-sui or Tang-shui-khi alone is navigable, allowing sea vessels to proceed about 3 miles inland, and junks of considerable size about 10 miles farther. There is a fine lake 4 miles long by 2 broad called the Tsui-sia-hai, or Lake of the Water Savages, not far from Posia. The scenery of Formosa is frequently of majestic beauty; and to this it is indebted for its European name, happily bestowed by the early Spanish navigators. As seen from the eastern coast "the outline of the mountains is at once beautiful and fantastic; domes and peaks and wall-like precipices succeed each other in striking variety; a brilliant verdure clothes their sides, down which dash cascades that shine like silver in the tropical sunlight" (Bridge in *Fortnightly Review*, 1876). The climate, though a tropical one, is agreeable and healthy, being tempered by the influences both of the sea and the mountains. According to thermometric observations made at Kelung in 1874, the hottest months are June, July, August, and September, with an average of from 81·76° to 82·81° F. in the shade, and the coldest month is January, with an average of 57·70°. The thermometer almost reached 90° in the early part of July, and in January was frequently about 52° or 55°. For the same year the rainfall amounted to 118 inches, of which the most fell in January, February, March, and May. The vegetation of the island is characterized by tropical luxuriance,—the mountainous regions being clad with dense forest, in which various species of palms, the camphor-tree (*Laurus Camphora*), and the aloe are conspicuous. Mr. Swinhoe obtained no fewer than 65 different kinds of timber from a large yard in Taiwanfu; and his specimens are now to be seen in the museum at Kew. The tree which supplies the materials for the pith paper of the Chinese is not uncommon, and Mr. Pickering found the cassia tree in the mountains. Travellers are especially struck with the beauty of some of the wild flowers, more especially with the lilies and convolvuluses; and our European greenhouses have been enriched by several Formosan orchids and other ornamental plants. The pine-apple grows in abundance. In the lowlands of the western portion, the Chinese have introduced a large number of cultivated plants and fruit trees. Rice is grown in such quantities as to procure for Formosa the title of the "granary of China;" and the sweet potato, taro, millet, barley, wheat, and maize are also cultivated. Sugar, tea, indigo, ground pea-nuts, jute, hemp, oil, and ratans are all articles of export, and some of them produce no inconsiderable trade. The principal tea district is about Banka, but the area devoted to this valuable crop is rapidly increasing. A large part of the tea finds its way to America. In some parts of the island it is probable that coffee may be grown with advantage. The Formosan fauna has been but partially ascertained; but at least three kinds of deer, wild boars, bears, goats, monkeys (probably *Macacus speciosus*), squirrels, and flying squirrels are fairly common, and panthers and wild cats are not unfrequent. A poisonous but beautiful green snake is often mentioned by travellers. Pheasants, ducks, geese, and snipe are abundant; and Dr. Collingwood in his *Naturalist's Rambles in the China Seas* mentions *Ardea prasinosceles* and other species of herons, several species of flycatchers, kingfishers, shrikes, and larks, the black drongo, the *Cotyle sinensis*, and the *Prinia sonitans*. Dogs are kept even by the savages for hunting. The horse is hardly known, and his place is taken by the ox, which is regularly bridled and saddled and ridden with all dignity. The rivers and neighboring seas seem to be well stocked with fish, and especial mention must be made of the turtles, flying-fish, and brilliant coral-fish which swarm in the waters warmed by the *Kurosiwo* current, that gulf-stream of the Pacific. Shell-fish form an important article of diet to both the Chinese and the aborigines along the coast,—a species of Cyrena, a species of Tapes, *Cytherœa petechiana*, and *Modiola teres* being most abundant.

The inhabitants of Formosa may be divided into three classes:—the Chinese, many of whom have immigrated from the neighborhood of Amoy and speak the dialect of that district, while others are Hakkas from the vicinity of Swatow; the subjugated aborigines, now largely intermingled with the Chinese; and the uncivilized aborigines of the eastern region, who refuse to recognize the Chinese authority, and carry on raids as opportunity occurs. The semi-civilized aborigines, who have adopted the Chinese language, dress, and customs, are called Pe-pa-hwan (*Anglice* Peppo-hoans), while their wilder brethren bear the name of Che-hwan or green savages. They appear to belong to the Malay stock, and their language, according to Gabelentz's investigations in the *Zeitschrift der Morgenländ, Gesellschaft*, 1859, bears out the supposition.[1] They are broken up into almost countless tribes and clans, many of which number only a few hundred individuals, and their language consequently presents a variety of dialects, of which no classification has yet been effected: in the district of Posia alone, says Dr. Dickson, of the Presbyterian mission, there are "eight different mutually unintelligible dialects." Mr. Corner of Amoy describes the people themselves as of "middle height, broad-chested, and muscular, with remarkably large hands and feet, the eyes large, the forehead round, and not narrow or receding in many instances, the nose broad, the mouth large and disfigured with betel." The custom of tattooing is universal. In the north of the island at least, the dead are buried in a sitting posture under the bed on which they have expired. Petty wars are extremely common, not only along the Chinese frontiers, but between the neighboring clans; and the heads of the slain are carefully preserved as trophies. In some districts the young men and boys sleep in the skull-chambers, in order that they may be inspired with courage. Many of the tribes that have had least intercourse with the Chinese show a considerable amount of skill in the arts of civilization. The houses, for instance, of the village of Ka-fri-ang in the south are described by Rev. W. Campbell as "built of stone, tiled with immense slabs of a slaty kind of rock, and fitted up within with accommodation for sleeping comfortably as well as for cooking, and for storing up abundance of materials for personal and household use." Manchester prints and other European goods are in pretty general use; and the women, who make a fine native cloth from hemp, introduce colored threads from the foreign stuffs, so as to produce ornamental devices. The office of chieftain is sometimes held by women. Intermarriage between the Chinese and the natives is very common.

The Chinese portion of the island was till 1876 divided into the districts of Komalan, Tam-sui, Chang-hua, Kia-i, Tai-wan, Feng-shan, of which Komalan or Kapsiulangting was the only one on the eastern side; but the districts of Komalan and Tam-sui have been abolished, and a department of North Formosa established with three dependent magistracies. A highway runs from Bangka in the north to Pangliavu in the south. Beginning at the north we find the following places of importance:—Kelung, the ancient Pe-Kiang, a treaty port in the neighborhood of the mines; Tam-sui, or properly Howei or Hobay, also a treaty port with 100,000 inhabitants, on the harbor of the same name, which is formed by hills upwards of 2000 feet high and has a depth of 3½ fathoms and a bar of 7½ feet; Twa-tu-tia, about 13 miles up the Tam-sui river in a tea district, and possessing a population of 20,000; Mengka, Bangka, or Banca, a little higher up the river, one of the most flourishing commercial towns in the north, with 30,000 inhabitants; Teukcham or Teuxham, a walled town at the head of the Tam-sui district, with a population of 40,000 inhabitants; Heong-san and Tiong-Kang, both near the coast; Oulan and Suikang, both inland; Changhwa the capital of a district, and the second city in the island, with a population of 60,000 or 80,000; Chip-Chip, a large town inhabited solely by Chinese; Kagee, or Chin-la-san, and Ung-Kanbay; Kok-si-Kong, with a small harbor; Taiwanfu, the capital of the island, with 30,000 inhabitants (or according to another statement, 100,000), a treaty port, and the remains of the Dutch port of Zelandia; Takao or Takow, also a treaty port, in 22° 37′ N. lat., 120° 16′ E. long., to the south of Ape's Hill; Pataou or Pitau, a few miles inland, the Feng-shan-hsien of ancient documents; and Tang-Kang, a town of 20,000 inhabitants. Besides these there are many places of several thousands of a population, and the whole of the Chinese territory is dotted with villages and hamlets. The whole island is estimated to contain from one and a half to two million souls, the smaller number being probably nearer the truth. The Chinese influence is rapidly spreading, and the island is more and more attracting the attention of foreigners.

The island of Formosa must have been known from a very early date to the Chinese who were established in the Pescadores. The inhabitants are mentioned in the official works of the Yuan dynasty as Tung-fan or southern barbarians; and under the Ming dynasty the island begins to appear as Kilung. In the beginning of the 16th century it began to be known to the Portuguese and Spanish navigators, and the latter at least made some attempts at establishing settlements or missions. The Dutch were the first, however, to take footing in the island; in 1624 they built a fort, Zelandia, on the east coast, where has since risen the town of Taiwan, and the settlement was maintained for thirty-seven years. On the expulsion of the Ming dynasty in China a number of their defeated adherents came over to Formosa, and, under a leader called in European accounts Coxinga, succeeded in expelling the Dutch and taking possession of a good part of the island. In 1682 the Chinese of Formosa recognized the emperor Kanghi, and since then it has formed part of the empire. In 1714 the Jesuit mathematicians from the court visited the island. In 1782 occurred a most destructive storm, which laid the public buildings in ruins and wrecked twenty-seven of the imperial warships; and in 1788 there broke out a violent rebellion, which was put down only after the loss, it is said, of 100,000 (?) men by disease and sword, and the expenditure of 2,000,000 taels of silver. In the early part of the present century the island was principally known to Europeans on account of the wrecks which took place on its coasts, and the dangers that the crews had to run from the cannibal propensities of the aborigines, and the almost equally cruel tendencies of the Chinese. Among the most notable cases was the loss in 1842 of the British brig "Ann," with fifty-seven persons on board, of whom forty-three were executed at Taiwan. By the treaty of Tientsin (1860) Taiwan was opened to European commerce, but Mr. Swinhoe found the place quite unsuitable for a port of trade, and the harbor of Tam-sui was selected instead. Shortly afterwards a rebellion broke out, to which several of the Chinese authorities fell victims; and for some time the condition of the foreign settlers was rather precarious, while the trade of the new port was so small that it was proposed to relinquish the consulate. In 1865 Dr. Maxwell of the English Presbyterian Church established a medical mission first at Taiwan and afterwards at Takao; and the organization thus originated comprised in 1877 thirteen churches among the Chinese, and as many among the aborigines of the southern provinces, with upwards of 1000 baptized converts and 3000 attendants at worship. The northern provinces are in the hands of the Presbyterian Church of Canada, which commenced its operations in 1872, and had nine stations in 1877. A Roman Catholic mission has also been in existence in the island since 1859. In 1867 the United States consul at Amoy made a treaty with Tok-a-Tok, a chief of the aborigines of the southern part of the island, by which the safety of foreigners was secured in that district. An attack made on the Protestant and Roman Catholic missions at Feng-shan-hsien in 1868 led the British consul to authorize the occupation of Fort Zelandia and Amping by Colonel Gordon; but his action was afterwards disapproved by the home Government, and the indemnity demanded from the Chinese restored. In 1872 the crew of a Japanese vessel shipwrecked on the coast being murdered by the savages, the Japanese Government sent an expedition to punish the assassins, and a war between China and Japan would have been the consequence if Wade the English ambassador had not succeeded in bringing them to terms,—China agreeing to pay 500,000 taels as compensation to the friends of the murdered men and to purchase the houses, etc., erected by the Japanese, and the Japanese on their side withdrawing their troops and giving up all claims to occupation. According to Mr. Hewlett's report for 1872, the political state of the island is very bad; the official classes, he says, have a proverb "every three years an outbreak, every five a rebellion," and the reason of this instability is to be found in their own rapacity and glaring violations of justice. A more hopeful account is given by Mr. Morrison in 1877; under the enlightened government of Ting, formerly *futai* of Fuh-chow, roads are being constructed throughout the Chinese territory, and other measures adopted for the development of its resources. A telegraph has been laid between Taiwanfu and Takao; and the proposal to make a railway from the south to the north of the island is being seriously discussed. A fort was built at Amping (the port of Tàiwanfu) between 1874 and 1876, and two others at Takao. A scheme is in operation for the military reduction of the east coast districts, and a road is being pushed south from Sauo.

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[1] Compare lists in *Journ. of Roy. Geog. Soc.*, 1873, and in Collingwood's Appendix.

Literature.—G. Candidius, *A short account of the island of Formosa*, 1637, printed in Churchill's Collection, vol. i.; *'t Verwaarloozde Formosa*, by C. E. S., Amsterdam, 1675, translated into French as "Formose négligée" in the *Recueil de voyages pour l'établ. de la Comp. des Indes*, t. x.; Valentyn, *Oud en Nieuw Oozt Indien*, t. iv., with a large map of the island; Malte-Brun, "Analyse de quelques mémoires hollandais sur l'île de Formose," in *Annales des Voyages*, 1810; Klaproth, "Description de Formose," in *Mem. relatifs à l'Asie*, t. i., and "Sur la langue des indigènes," in *Journal Asiatique*, 1822; Lindsay and Gutzlaff, *Voyage to the Northern Ports of China*, 1833; E. Stevens, "Island of Formosa," in *Chinese Repository*, vol. ii., 1833; E. C. B., "Dealings of the Chinese Government in Formosa," in *Chinese Repository*, 1837; Lieut. Gordon, "On Coal in the N.E. of Formosa," in *Journ. Roy. Geog. Soc.*, 1849; Robert Swinhoe, "Bericht über die Westküste von Formosa," in *Ztschr. für Allgem. Erdk. zu Berlin*, 1857, translated from *Overland Chinese Mail*; "Visit to Formosa," in *Jour. of North China branch of Roy. As. Soc.*, 1859; "Notes on Formosa," in *Jour. Roy. Geog. Soc.*, 1864; "Additional Notes," in *Proceed. Roy. Geog. Soc.*, 1866; Habersham. *My Last Cruise*, 1857; Biernatzki, "Zur Kunde der Insel Formosa," in *Ztschr. für Allgem. Erdk.*, 1857, and "Die Insel Formosa," in *Ztschr. für Allgem. Erdk.*, 1859; Jomard, *Coup d'œil sur l'île Formose*, Paris, 1859; E. W. Brooker, "Observations on Tai-wan," in *Nautical Mag.*, 1858, and "Journal of H.M.S. the Inflexible," in *Nautical Mag.*, 1859; A. C. Gras, *Renseignements sur les îles Bashee, îles les Formose*, etc., 1860; G. Stanley, "Les Côtes O. et S. der Formose," in *Annales hydrogr.*, 1867; "Ile Formose," in *Annales de la prop. de la foi*, 1867; Vivien de Saint Martin, "Aperçu général de l'île de Formose," in *Bull. de la Soc. de Géogr.*, 1868; Guérin and Bernard, "Les aborigènes de l'île de Formose," *Bull. de la Soc. de Géogr.*, 1868; E. W. Brooker, "Remarks on the Coast of Formosa," in *Nautical Magazine*, 1868; Bechtinger, *Het eiland Formosa*, 1871; Thomson, "Notes of a journey in Southern Formosa," in *Proceedings of Roy. Geogr. Soc.*, 1873; Taintor, *Aborigines of Formosa*, 1874; Bax, *Eastern Seas*, 1875; Arthur Corner, "Journey in interior of Formosa," in *Proc. Roy. Geogr. Soc.*, 1875; Knoblauch, "Einige Notizen über Formosa," in *Mitth. d. Deutsch. Ges. für Natur- und Völkerkunde Ost Asiens*, Yokohama, 1875; Kühne, in *Annalen der Hydrogr. und mar. Meteor.*, 1875; Cyprian Bridge, "An Excursion in Formosa," in the *Fortnightly Review*, 1876; H. J. Allen, "Notes of a journey through Formosa," in *Proc. Roy. Geog. Soc.*, 1877; T. L. Bullock, "A trip into the interior of Formosa," in *Proc. Roy. Geog. Soc.*, 1877; James Morrison, "Description of the Island of Formosa," in *Geographical Magazine*, 1877; W. A. Pickering, "Among the Savages of Central Formosa, 1866–67," in *Messenger of Presbyt. Church of England*, 1878; and British Consular Reports. A map of the island is given by E. G. Ravenstein in the *Geographical Magazine*, Oct., 1874.

FORMOSUS, the successor of Stephen V. (or VI.), as pope, first appears in history when, as bishop of Porto, he was sent on an embassy to the Bulgarians. Having afterwards sided with the German faction against John VIII., he was excommunicated, and compelled to take an oath never to return to Rome, or again to assume his priestly functions. From this oath he was, however, absolved by Martin II., the successor of John VIII., and restored to his dignities; and on the death of Stephen V. in 891 he was chosen pope. The Italian faction had chosen Sergius, and the election of Formosus, which was in opposition to an old rule against the translation of bishops from one see to another, had to be confirmed by recourse to violence, but was rendered secure for a time by the success of the arms of Arnulf of Germany. After the withdrawal of Arnulf, Formosus was compelled to grant the imperial crown to Lambert, son of Guido of Italy, but this act did not pacify the Italian faction, and Formosus was only released from very hard straits by the arrival of Arnulf, who captured the city in the end of 895. In the following year Arnulf was crowned emperor by Formosus, but before the death of the latter in May, the excesses of Arnulf and his soldiers had begun to create a strong opposition to the German power amongst all parties in Italy. By Stephen VI. the body of Formosus was disinterred, and treated with contumely as that of a usurper of the papal throne; but Theodorus II. restored it to Christian burial, and at a council presided over by John IX. the pontificate of Formosus was declared valid and all his acts confirmed.

FORRES. See Elgin, vol. viii. p. 122.

FORSKAL, Peter (1736–1763), a celebrated Oriental traveller and naturalist, was born in Sweden in 1736. He studied at Göttingen, where he published a dissertation entitled *Dubia de Principiis Philosophiæ Recentioris*, which gained him some reputation. Thence he returned to his native country; but in 1759 he alienated the good-will of the Government by the publication of a pamphlet entitled *Pensées sur la Liberté Civile*. His acquaintaince with natural history, however, had gained him the friendship of Linnæus, who recommended him to Frederick V. of Denmark. From that sovereign he obtained the title of professor at Copenhagen, and Frederick also appointed him to accompany Carsten Niebuhr in an expedition to investigate Arabia and Egypt. He died of the plague at Jerim in Arabia, July 11, 1763. His friend and companion Niebuhr was entrusted with the care of editing his MSS., and published in 1775 *Descriptiones Animalium, Avium, Amphibiorum, Piscium, Insectorum, Vermium, quæ in itin. Orient. observavit Petrus Forskal*. In the same year appeared also an account of the plants of Arabia Felix and of Lower Egypt, under the title of *Ægyptiaco-Arabica*, which is important as containing the first discussion of the relation of vegetation to climate.

FORST, originally Forsta or Forste, a town of Brandenburg, Prussia, circle of Sorau, is situated on the Neisse, 44 miles S.E. of Frankfort-on-the-Oder. Its principal industries are tanning and the manufacture of woollen cloth; and it has also a considerable cattle trade. Near the town are the ruins of an old castle. Forst was founded in the 13th century, and was burned down by the Hussites in 1430. From 1667 it belonged to the dukes of Sachsen-Merseburg, from 1740 to the palatinate of Saxony, and from 1815 to Prussia. Population in 1875 (including Altforst, united to it in 1874), 14,148.

FORSTER, François (1790–1872), a French engraver, was born at Locle in Neufchâtel, 22d August, 1790. In 1805 he was apprenticed to an engraver in Paris, and he also studied painting and engraving simultaneously in the École des Beaux Arts. His preference was ultimately fixed on the latter art, and on his obtaining in 1814 the first "grand prix de gravure," the king of Prussia, who was then with the allies in Paris, bestowed on him a gold medal, and a pension of 1500 francs for two years. With the aid of this sum he pursued his studies in Rome, where his attention was devoted chiefly to the works of Raphael. In 1844 he succeeded Tardieu in the Academy. He died at Paris, 27th June, 1872. Forster occupied the first position among the French engravers of his time, and was equally successful in historical pieces and in portraits.

Among his works may be mentioned—The Three Graces, and *La Vierge de la légende*, after Raphael; *La Vierge au bas-relief*, after Leonardo da Vinci; Francis I. and Charles V., after Gros; St. Cecilia, after Paul Delaroche; Alfred Dürer and Henry IV., after Porbus; Wellington, after Gérard; and Queen Victoria, after Winterhalter.

FÖRSTER, Friedrich (1791–1868), a German historian, brother of Ernst Joachim Förster the painter, was born at Münchengrosserstädt on the Saale, September 24, 1791. After receiving his early education in the gymnasium at Altenburg, he studied theology at Jena, but subsequently devoted his attention for a time chiefly to archæology and the history of art. On the uprising of Prussia against France in 1813 he joined the army, where he soon attained the rank of captain. At the close of the war he was appointed professor at the school of engineering and artillery in Berlin, but on account of certain democratic writings he was dismissed from that office in 1817. He then became connected with various literary journals, and in 1830 undertook with his brother an art tour in Italy. Shortly after his return he received an appointment at the royal museum of Berlin, with the title of court councillor. Förster was the founder and secretary of the *Wissenschaftlichen Kunstverein* (scientific art union) of Berlin. He died at Berlin, 8th November, 1868.

The following are his principal works:—*Der Feldmarschall Blücher und seine Umgebungen*, Leipsic, 1821; *Friedrich's d. Gr. Jugendjahre, Bildung, und Geist*, Berlin, 1822; *Albrecht von Wallenstein*, Potsdam, 1834; *Wallenstein's Process*, Leipsic, 1844; *Geschichte Friedrich Wilhelms I., Königs von Preussen*, 3 vols., Potsdam, 1834–35; and *Die Höfe und Cabinete Europas im 18ten Jahrh.*, 3 vols., Potsdam, 1836–39. He also wrote a number of popular historical works, the principal of which are *Neuere und neuste preuss. Geschichte*, and *Geschichte der Befreiungskriege*, 1813, 1814, and 1815, both of which have reached several editions; and besides editing an edition of Hegel's works, and adapting several of Shakespeare's and other dramatists' plays for the theatre, he is the author of a number of poems, which were collected and published at Berlin 1838, and of an historical drama, *Gustav Adolf*, 1832. The beginning of an autobiography of Förster was published at Berlin in 1873, under the title *Kunst und Leben*.

FÖRSTER, Johann Georg Adam (1754–1794), an eminent German naturalist and writer on scientific subjects, was born at Nassenhuben, a small village near Dantzic, in November, 1754. His father, Johann Rheinhold Forster, a man of great scientific attainments but an intractable temper, was at that time pastor of the place; the family are said to have been of Scotch extraction. In 1765 the elder Forster was commissioned by the empress Catherine to inspect the Russian colonies in the province of Saratov, which gave his son an opportunity of acquiring the Russian language and the elements of a scientific education. After a few years the father quarrelled with the Russian Government, and suddenly embraced the resolution of proceeding to England, where he obtained a professorship of natural history and the modern languages at the famous nonconformist academy at Warrington. His violent temper soon compelled him to resign this appointment, and for two years he and his son earned a precarious livelihood by translations in London,—a practical education, however, exceedingly useful to the younger Forster, who became a thorough master of English, and acquired many of the ideas which chiefly influenced his subsequent life. At length the turning point in his career came in the shape of an invitation for him and his father to accompany Captain Cook in his third voyage round the world. Such an expedition was admirably calculated to call forth Forster's peculiar powers. He attained no remarkable distinction as an original discoverer or investigator, but his insight into nature was accurate and penetrating; he conceived of her as a living whole, and reproduces her vitality in his animated pages. His account of Cook's voyage is almost the first example of the glowing yet faithful description of natural phenomena which has since made a knowledge of them the common property of the educated world,—a prelude to Humboldt, as Humboldt to Darwin and Wallace. The publication of this great work was, however, impeded for some time by differences with the Admiralty, during which Forster proceeded to the Continent to obtain an appointment for his father as professor at Cassel, and found to his surprise that it was conferred upon himself. The elder Forster, however, was soon provided for elsewhere, being appointed professor of natural history at Halle. At Cassel Forster formed an intimate friendship with the great anatomist Soemmerring, and about the same time made the acquaintance of Jacobi, who inspired him with a mystical spirit from which he subsequently emancipated himself. These were the days of secret societies, masonic lodges, and conventions of illuminati. Forster was for a long time deeply implicated in their proceedings, the purpose of which remains obscure. The want of books and scientific apparatus at Cassel induced him to resort frequently to Göttingen, where he betrothed himself to Therese Heyne, the daughter of the illustrious philologist, a clever and cultivated but heartless woman, who became the evil genius of his life. To be able to marry he accepted (1784) a professorship at the university of Wilna, where he found himself greatly misplaced. The penury and barbarism of Polish circumstances are graphically described in his and his wife's letters of this period. After a few years' residence at Wilna he resigned his appointment to participate in a scientific expedition projected by the Russian Government, and upon the relinquishment of this undertaking became librarian to the elector of Mayence. In 1790 he published his travels in the Netherlands, with special reference to the art of the country—a work displaying the same power of exposition in æsthetic matters as he had previously shown in the description of the aspects of nature. This was his last work. The principality of Mayence was now involved in the vortex of the French Revolution, and Forster unhappily suffered himself to be drawn into a position incompatible either with fidelity to his master the elector, or allegiance to his country. With his liberal sympathies and deficiency in political insight, he might be excused for welcoming the French as deliverers, but in promoting the actual incorporation of Mayence with France, he justly incurred the execration of patriotic Germans, notwithstanding the unquestionable purity of his intentions. Domestic sorrows were added to public calamities: Forster found himself not only deserted by his wife but deprived of his children. It is difficult to determine whether his apparent resignation should be ascribed to romantic self-sacrifice or to the apathy of an exhausted spirit. The situation was nearly the same as that of George Sand's *Jacques*, and the catastrophe not very dissimilar. Forster died suddenly and opportunely, January, 1794, in Paris, whither he had gone as deputy from Mayence in the worst days of the Reign of Terror. His personal character was most amiable; he was high-minded, disinterested, ingenuous to a fault; but he was weak, impulsive, ill-starred throughout his life, and totally unequal to the difficult circumstances in which he ultimately found himself. As an author he stands very high; he is almost the first and almost the best of that valuable class of writers who have made science and art familiar by representing them in their essential spirit, unencumbered with technical details. Schlegel remarks that no other German prose writer carries his reader so far, leaving him not merely enriched with positive knowledge but animated with the passion for further progress; that the books of no other such writer convey so lively an impression of having been composed outside the study in the free air; and that no other is animated by so constant a sense of the infinite perfectibility of human nature.

Forster's writings have been frequently collected. The most important have been mentioned above, but there are numerous minor essays of great value and artistic completeness. His correspondence with his friend Soemmerring has been recently published by Hettner, and is full of interest. The biography by Moleschott is very agreeably written, but is rather a delineation of a typical naturalist than of the actual man, and its account of Forster's political career is vitiated by the writer's own deficiency in patriotic feeling. The other side of the question is presented with unnecessary asperity in Klein's *George Forster in Mayence*. There are excellent critical estimates by Schlegel and Gervinus, the latter prefixed to the seventh volume of Forster's writings. (R. G.)

FORSTER, JOHN (1812–1876), an English historian, biographer, journalist, and critic, was born April 2, 1812, at Newcastle, where his father, a member of the Unitarian Church, followed the occupation of a butcher. He was well grounded in classics and mathematics at the grammar school of his native town, and gave early promise of future distinction. After a brief residence at Cambridge he removed in 1828 to London, where he attended law classes in connection with the recently founded university, but devoted himself chiefly to literary pursuits. The earlier productions of his pen were contributed to various liberal papers, particularly to *The True Sun*, *The Morning Chronicle*, and *The Examiner*. As literary and dramatic critic for the last-named journal, he from the outset showed much conscientiousness, discrimination, and tact, and the influence of his powerful individuality soon made itself strongly felt. He had not long passed his twentieth year when the publication of his *Lives of Eminent British Statesmen* began. This work, originally undertaken for Lardner's *Cyclopædia*, and published separately in 1840 under the title of *The Statesmen of the Commonwealth of England, with a Treatise on the Popular Progress in English History*, was immediately recognized as a work of great interest and value, entitling its author to high literary rank. Thenceforward he was a prominent figure in that distinguished circle of literary men which included such names as Bulwer, Talfourd, Fonblanque, Landor, Carlyle, Dickens. In 1843 he was called to the bar by the benchers of the Inner Temple; but while highly valuing this honorable connection with the legal profession, he never became or sought to become a practising lawyer. His energies were mainly devoted to laborious historical investigations, while relaxation was sought chiefly in lighter forms of literary activity. For some years he edited the *Foreign Quarterly Review;* in 1846, on the retirement of Charles Dickens, he took charge for almost a year of the *Daily News;* in 1847, on the resignation of Albany Fonblanque, he became editor of the *Examiner*, and this post he retained till 1856. From 1836 onwards he contributed to the *Edinburgh*, *Quarterly*, and *Foreign Quarterly Reviews* a variety of articles, some of which were republished in two volumes of *Biographical and Historical Essays* in 1858. In 1848 appeared his *Life of Oliver Goldsmith*, which, especially as revised and improved in a second edition (1854), has taken an acknowledged place as one of the most admirably executed biographies to be found in the whole range of English literature. Continuing his original researches into English history at the period of the Revolution, he published in 1860 two volumes, respectively entitled *Arrest of the Five Members by Charles I.—A Chapter of English History rewritten*, and *The Debates on the Grand Remonstrance, with an Introductory Essay on English Freedom*. These were followed by his *Biography of Sir*

John Eliot, published in 1864, an elaborate and finished picture from one of his earlier studies for the *Lives of the Statesmen*. In 1868 appeared his biography of his friend Walter Savage Landor. For several years he had been collecting materials for a life of Swift, but his studies in this direction were for a time suspended in consequence of the death of Charles Dickens, with whom he had long been on terms of intimate friendship. The first volume of Forster's *Life of Dickens* appeared in 1871, and the work was completed in 1874. Towards the close of 1875 the first volume of his *Life of Swift* was published; and he had made some progress in the preparation of the second, when he was seized with an illness of which he died on the first of February, 1876. He lies buried in Kensal-Green Cemetery, where a just and discriminative inscription tells that he was "noted in private life for the robustness of his character and the warmth of his affections; for his ceaseless industry in literature and business, and the lavish services which, in the midst of his crowded life, he rendered to his friends; for his keen appreciation of every species of excellence, and the generosity of his judgments on books and men." In 1855 Forster had been appointed secretary to the Lunacy Commission, and for some years after 1861 he held the office of a commissioner in lunacy. In 1860 he received the honorary degree of LL.D. from the university of Edinburgh. His valuable collection of manuscripts, along with his books and pictures, was bequeathed to the South Kensington Museum.

FORT DE FRANCE, formerly PORT ROYAL, the capital of the French island of Martinique, one of the smaller Antilles, is situated on the west coast of the island, on the north side of a well-sheltered bay. It is the residence of the governor, and possesses a court of justice and a chamber of commerce. The harbor, which is commanded by a fort, is good and safe, and connected with it there is a floating dock and a repairing dock. The town possesses sugar works, and its chief exports are sugar, coffee, and rum. Its trade will be considerably increased by the railway to St. Pierre. During the war with France Port Royal was for a time the headquarters of the British West Indian fleet. The population of the town is about 11,500.

FORTESCUE, SIR JOHN, an eminent English lawyer in the reign of Henry VI., was descended from an ancient family in Devonshire, and, in all probability, was born at Norris, near South Brent in Somersetshire, towards the close of the 14th century. He was educated at Exeter College, Oxford. During the reign of Henry VI. he was three times appointed one of the governors of Lincoln's Inn. In 1441 he was made a king's sergeant at law, and in the following year chief justice of the king's bench. As a judge Fortescue is highly commended for his wisdom, gravity, and uprightness; and he seems to have enjoyed great favor with the king, who is said to have given him some substantial proofs of esteem and regard. He held his office during the remainder of the reign of Henry VI., to whom he steadily adhered; and having faithfully served that unfortunate monarch in all his troubles, he was attainted of treason in the first parliament of Edward IV. When Henry subsequently fled into Scotland, he is supposed to have appointed Fortescue, who appears to have accompanied him in his flight, chancellor of England. In 1463 Fortescue accompanied Queen Margaret and her court in their exile on the Continent, and returned with them afterwards to England. During their wanderings abroad the chancellor wrote for the instruction of the young Prince Edward his celebrated work *De laudibus legum Angliæ*. On the defeat of the Lancastrian party, he made his submission to Edward IV., from whom he received a general pardon dated Westminster, October 13, 1471. He died at an advanced age, but the exact date of his death has not been ascertained.

Fortescue's masterly vindication of the laws of England, though received with great favor by the learned of the profession to whom it was communicated, did not appear in print until the reign of Henry VIII., when it was published by Whitechurch in 16mo, but without a date. In 1516 it was translated by Mulcaster, and printed by Tottel; and again in 1567, 1573, and 1575, and also by White in 1598, 1599, and 1609. It was likewise printed, with Hengham's *Summa Magna et Parva*, in 1616 and 1660, 12mo; and again with Selden's notes in 1672, in 12mo. In 1737 it appeared in folio; and, in 1775, an English translation, with the original Latin, and Selden's notes, besides a variety of remarks relative to the history, antiquities, and laws of England, was published in 8vo. Waterhouse's *Fortescue Illustratus*, which appeared in 1663, though prolix and defective in style, may be consulted with advantage. Another valuable and learned work by Fortescue, written in English, was published in 1714, under the title of *The Difference between an Absolute and Limited Monarchy, as it more particularly regards the English Constitution, and accompanied with some remarks by John Fortescue Aland, of the Inner Temple, London*; and a second edition with amendments appeared in 1719. In the Cotton Library there is a manuscript of this work, in the title of which it is said to have been addressed to Henry VI.; but many passages show plainly that it was written in favor of Edward IV. Of Fortescue's other writings, which were pretty numerous, the most important are—1. *Opusculum de Natura Legis Naturæ, et de ejus censura in successione Regnorum Supremorum*; 2. *Defensio juris Domus Lancastriæ*; 3. *Genealogy of the House of Lancaster*; 4. *Of the Title of the House of York*; 5. *Genealogiæ Regum Scotiæ*; 6. *A Dialogue between Understanding and Faith*; 7. *A Prayer Book which savors much of the Times we live in.* In 1869 his descendant, Lord Clermont, printed for private distribution *The Works of Sir John Fortescue, now first collected and arranged*, and *A History of the Family of Fortescue in all its branches* (see *Lambeth Review*, 1872).

FORTH, one of the largest rivers in Scotland. It is formed of two streams rising to the north of Ben Lomond (one of them passing through Loch Chon and Loch Ard), which unite above Aberfoyle. The river flows eastward in a direct course for above 100 miles, receiving in its progress the Goodie, the Teith, and the Allan above Stirling, and below it the Devon, the Carron, the Avon, the Almond, the Leith, the Esk, the Leven, the Tyne, and others; and it discharges itself into the German Ocean in about 56° 10′ N. lat. The windings or "links" of the Forth above and below Stirling are extremely tortuous. From its junction with the Teith to the "carse" or alluvial plain below Gartmore they extend about 28 miles, although the distance in a direct line is only about 20. From Stirling harbor to Alloa, where it widens into an estuary, the length of the river is 10½ miles, though the distance in a straight line is not more than 5. From Grangemouth to North Queensferry the depth increases in the first mile from 10 to 15 feet, in the second to 25, and in the third mile to 53 feet, while the remaining part of the distance—7 miles, including the great anchorage of St. Margaret's Hope—has a depth generally of about 60 feet at low water. At Queensferry the firth is 2 miles wide; between Dysart and Aberlady about 12; and between St. Abb's Head and Fifeness, where it joins the German Ocean, it is from 35 to 40 miles. Near Queensferry, between Inchgarvie and the North shore, it deepens to 37 fathoms. The bed of the river consists to a great extent of mud,—the depth of the deposit in some places being upwards of 200 feet; and there are extensive alluvial formations along the lower part of its course and in the upper reaches of its estuary. The tides are felt 4½ miles above Stirling, and at Stirling harbor the spring tides rise 7 feet 9 inches. At Leith and Kinghorn their average height is 17½ feet. Steamers go as far up the river as Stirling,—the only important obstructions to the navigation between that town and Alloa, the "Town Ford" and the "Abbey Ford," having been removed since 1843. The shallowness of the channel seems to have been occasioned by the practice in vogue from 1732 among the Stirlingshire proprietors of using the river to carry off the peat from their lands; Mr. Drummond of Blair-Drummond, for example, between 1783 and 1839 floated away upwards of 1000 acres of this substance. Further down in the firth the principal obstructions are the Drumsands near Cramond and the Sand-end to the east of Burntisland harbor. The anchorages in the firth are excellent; and it thus forms the most important harbor of refuge to the north of the Humber. Several of its ports carry on a large foreign trade, more especially Leith, Granton, Bo'ness, and Grangemouth. The fisheries of herring, white fish, and salmon are all of great economical importance, not only giving employment to a considerable local population, but attracting English and even foreign fishermen. The traffic between the two sides of the firth has been an object of legislation since 1467. Both the principal ferries—that between North and South Queensferry, and that between Granton and Burntisland—are now in the hands of the North British Railway Company. In connection with their system they have undertaken to construct a magnificent viaduct across the firth, the foundation stone of which was laid on the 30th of September, 1878. Thomas Bouch, the engineer entrusted with the enterprise, has practically revived a plan proposed as early as 1818 by James Anderson. The bridge is to cross a little to the east of the present line of traffic between North and South Queensferry, advantage being taken of the small island of Inchgarvie, which lies about mid channel. Its most striking features will be two spans of 1600 feet, constructed on the suspension principle at a height of 150 feet above high water of spring tides. In order to secure sufficient stability against the lateral pressure of the winds, which sometimes blow with great violence in the firth, these central portions will be split into two branches, each about 14 feet wide, which will lie 100 feet apart, but be bound together by horizontal braces. Both the great spans will be laid on a dead level, but the shoreward sections will have gradients of about one in 77 and one in 80. The total cost is estimated at £1,250,000, and it is expected that the works will be completed in 1882.

FORTIFICATION is the art of strengthening, by works of defence, positions in which it is proposed to place troops so as to render them secure from the attack of an enemy. Such positions may contain within them towns, dockyards, arsenals, and ports, or may serve merely for shelter for an army in the field; but the object to be attained is always the same, and the works of defence are so disposed round the position that, while they offer the greatest obstacles to the advance of their assailants, they afford the utmost shelter to their defenders. Fortification is, in short, the art of enabling the weak to resist the strong.

Various terms have been adopted in connection with the general term of Fortification, but none of them are of much use in considering the subject, and some may lead to error, by inducing the engineer to restrict himself under some circumstances to a very limited view of his subject. Thus, Fortification Natural and Fortification Artificial imply a useless distinction, as every engineer must avail himself of the natural advantages or obstacles of ground, as well as of the obstacles his science and genius enable him to add to them; and thus in every Fortification nature and art must act together. Fortification Regular and Fortification Irregular are defective terms, as no Fortification can possibly be regular unless it should so happen that the ground it occupies, as well as the ground surrounding it on all sides, is uniform in level and general character. Again Fortification Permanent and Fortification Field or Temporary have reference only to the immediate object of the works, or to the application of the science, and in no way affect its principles, which remain the same whether the work is a simple earthen intrenchment, or a great fortress surrounded by masonry walls. Fortification Offensive and Fortification Defensive are, however, of all terms the most objectionable, since they imply a contradiction to fact, for the perfection of defence depends as much on its active offensive operations as on the protection of its covering works, while the perfection of attack depends as much on the skill with which its passive protective works are pushed forward as on the fire of its batteries.

The principles of Fortification then should be studied unshackled by any of these distinctions, and the engineer should apply his means to his end, using without restriction the works best suited to his purpose; and it is in this way that the study of the subject will be here treated.

Elementary Fortification.

It is desirable to examine the exact meaning of technical words, in order to acquire a distinct notion of the ideas they were intended to convey, and to obtain a glimpse of the historical progress of the science in which they are used. Fortify, Fortifications, Fortress, Fort, are all derived from *fortis*, strong; and the idea the first two convey is that, by artificial arrangement, additional strength is bestowed upon one combatant over another, or upon one party of combatants over another party. A rock, the trunk of a tree, a bank of earth, or any natural object, which shelters the body of a man from the missiles of his opponent whilst it leaves him free to discharge his own, may be considered the simplest form of fortification.

A bank of earth, when reduced to the requisite thickness, and moulded into proper form, with such slopes as the particular tenacity of the earth may require to insure stability, or which the intended direction of the fire over its summit may render necessary, becomes a Parapet, so called from the Italian words *para*, a defence or guard, and *petto*, the breast, or, in English, a breastwork. If the Breastwork or Parapet be made only sufficiently high to permit the soldier to fire over it, he will be exposed after firing, and will be forced to crouch in order to obtain cover. The parapet is therefore made high enough to cover the soldier when standing up so that he can load with ease and security, and can move with safety from place to place behind it. This increased height renders it necessary to introduce a Banquette or step (accessible by an easy slope), standing upon which the soldier can fire over the parapet and from which he can retire by the interior slope to the lower ground behind it; the name Banquette is derived from *banchetta*, a little bench or step. As Parapets are usually formed artificially, the earth for their construction is derived from a ditch, which being dug immediately in front of and parallel to the parapet, forms by its depth an additional obstruction to an advancing enemy. Ordinary intrenchments are formed of a simple parapet and ditch, but in more important outworks and in fortresses the height is further augmented by elevating the parapet on another mound of earth called the Rampart (*riparo* in Italian), and as this additional height requires a greater quantity of earth, the ditch is made both wider and deeper. By these means the difficulties of attack are increased, additional cover is given to the magazines or other buildings within the fortress, and the command over the country is raised and improved in efficiency, by elevating the soldier so that he can see over the many minor obstacles which would otherwise restrict his field of view.

Some writers, regarding the presence or absence of the rampart as the main distinction between permanent and temporary works, have proposed to call the former Rampart or Town Fortification, the latter Parapet or Field Fortification; but this distinction is not of universal application, and the more ordinary divisions of Permanent and Field Fortification better indicate the nature of the works and the objects for which they are intended.

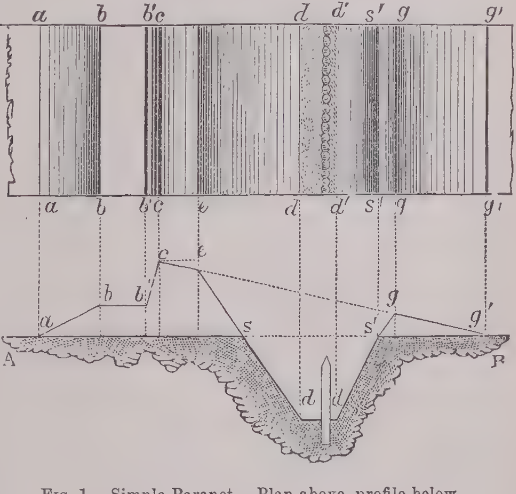

Fig. 1.—Simple Parapet. Plan above, profile below.

In order to study efficiently the combinations of these simple elements, with a view to form from them works of defence, it is necessary that we should know the manner in which such works are represented on paper. As in architecture, of which in earlier times fortification was only a military branch, this is effected by the plan, the section, and the elevation, of which the first two are the most important. The plan of a work is the orthographic projection of the lines of intersection of the planes of its slopes on the plane of construction. The elevation is a similar projection on a vertical plane. The section or profile is made on a plane perpendicular to the lines of intersection of the planes or slopes, and therefore represents the traces of these planes on the sectional plane. Fig. 1 represents a small portion of a simple parapet in plan and profile, and leads to the following explanation of terms:—

In the plan, *cc* represents the crest of the parapet or highest ridge line of the work. In delineating the outline of a work, it is this line which is always drawn; it is called the "trace." Between *cc* and *ee* is the superior slope; between *ee* and a line parallel to it through *s* is the exterior slope, prolonged in this case to the bottom of the ditch *dd*, being continuous with the escarp *sd*; *gg* is the crest of the glacis, or ridge of a slightly elevated mound of earth raised on the exterior edge of the ditch, or counterscarp, and sloping gently outward, so that the assailants passing over its surface may be in the prolongation of the superior slope of the parapet, and therefore in the line of fire from its crest; by its elevation the glacis increases the amount of descent into the ditch. Within the crest of the parapet are seen the interior slope of the parapet, bounded by *b′b′*, the banquette, between *b′b′* and *bb*, and the interior slope of the banquette, bounded by *aa*.

Relief.—This term is adopted to indicate the height of any point of the work either above the plane of construction, which is sometimes the plane of site, when it is called constructive relief, or above the bottom of the ditch, when it is called absolute relief. The absolute relief is a very important datum, as it expresses the total obstruction offered by the parapet and ditch to the ascent of the assailant, and it has a bearing on the regulation of the length of lines, which mutually defend each other. The Relief of a work is the relief of the crest of its parapet. The Command of a work is the height of the crest of its parapet, either above the plane of site if horizontal, or above any point of that plane specially referred to, or above the crest of the parapet of any other work in front of it; the difference of height, therefore, between the crest of the parapet in fig. 1 and the crest of the glacis is the command of the parapet over the glacis; in the one case the command is absolute, in the other relative.

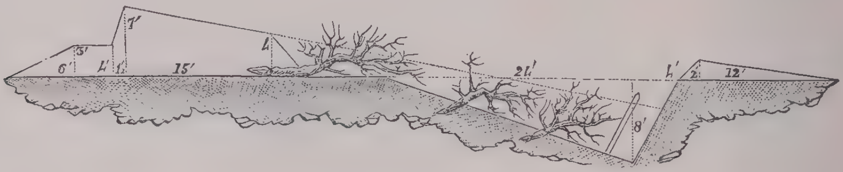

Fig. 2.—Arrangement of Abattis.

But after all a simple parapet and ditch afford only temporary protection, and it is necessary to stop an enemy as he advances to them by placing obstacles in his path which shall retain him as long as possible under the fire of the works opposed to him either in front or in flank. In the profile in fig. 1, the simplest form of such an obstacle, viz., a Palisade, is shown. When, however, in combination with direct fire only, as in the figure, palisades check an enemy but for a short time, and are principally useful as affording more time to the defenders. Indeed in any combination of defence palisades are now of much less value than formerly, as they are readily destroyed by indirect fire, and by the new explosives which are more portable and far stronger than gunpowder; they are mainly used in closing the gorges of temporary works. Many other obstacles may, however, be so arranged as to assist materially in rendering simple direct fire more effective.

Abattis are formed of trees cut down, and arranged side by side with the branches interlaced outwards, and the stems inwards; the branches should be freed from foliage, and their ends cut sharp. They may be arranged in one or more rows, so that the fire from the parapet shall sweep along their summits, their stems being firmly fastened by pickets to the ground and partly buried in it; an enemy would suffer great loss whilst attempting to remove them under fire. The best abattis are formed of good-sized growing trees. The trunks are partially cut through a little above the ground, and the trees are bent down and securely fastened to the ground and to one another by pickets and iron wire.

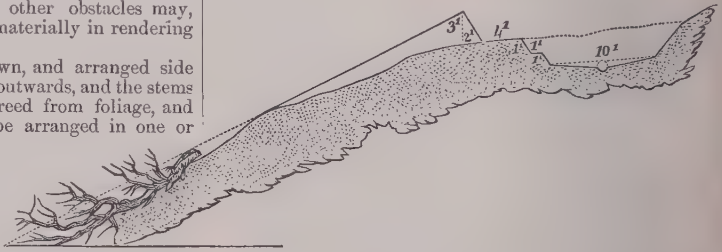

Fig. 3.—Simpler arrangement of Abattis.

Fig. 2 exhibits an arrangement of Abattis; and it will be observed that in this profile the exterior slopes of the parapet and the escarp are formed into one gentle slope, whilst the counterscarp retains its ordinary slope. By this modification the difficulty of descending into the ditch remains as before, and the sloping pickets in front of the abattis prevent the assailants from clearing it away. In simple inclosed works, such as redoubts, and in lines, the defence frequently depends on direct fire alone; and in these cases a work of the profile here figured with obstacles would be far more effective in checking an enemy than a work of ordinary profile without obstacles, and would render it impossible that a watchful garrison should be surprised; and this is a very important consideration, as a vigorous and bold enemy could scarcely be stopped if he had succeeded in arriving at the foot of the escarp unchecked.

Fig. 3 exhibits another arrangement formed only of large branches securely picketed down to the ground. In this case the form of the ground is taken advantage of, and the profile of the defensive line is modified, a trench being cut out behind it, and the banquette being formed on the surface of the ground. By simple arrangements of this kind, it will often be possible to carry defensive lines over a large extent of ground in a short period of time, and to obtain more effective defence by taking advantage of the natural facilities of the ground than by the construction, with a great expenditure of labor and time, of elevated works, not so well fitted to sweep the surface of the ground, and to act upon the obstacles placed to check the progress of the assailants.

Chevaux-de-frise.—The Cheval-de-frise (fig. 4) is a substitute for an abattis. It consists of a strong horizontal beam, 12 feet long and 9 inches square, through which are passed strong lance-like rods of wood or iron, sharp at both ends, and about 6 inches apart. Several of these may be joined together by rings and hooks with which the ends of the beams are fitted.

Chevaux-de-frise require a considerable amount of skilled labor in their construction; hence they can only be employed in limited quantities for limited objects. They are employed for temporary purposes, *e.g.*, as barriers to the entrance of a work, across a road or street, in positions where they can be easily removed when the communication is required to be used. They have the disadvantage of being removed or destroyed without much difficulty. It is, however, usual to keep as articles of store iron chevaux-de-frise, so made that the parts are separable for convenience of package and transport. If planted at the bottom of a hollow, exposed to direct fire, so that they must either be pushed uphill forward or pulled downhill backward, and

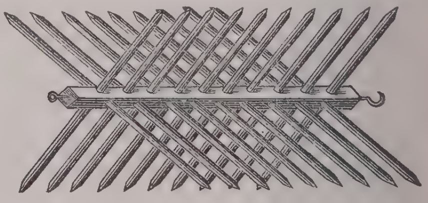

Fig. 4.—Cheval-de-frise.

securely fastened by chains to the ground or to upright posts, they form a very formidable obstacle.

Fraises are palisades placed in a horizontal or nearly horizontal position. They are of wood or iron, and are usually made about 10 feet long and 15 inches thick, bound together by two ribands, nailed above and below them and buried in the ground, without which they would be more easily torn away. They are fixed both on the counterscarp and on the escarp. When on the escarp they are inclined downwards, and the berm is cut away; when on the counterscarp, they are inclined upwards. On the counterscarp they are safe from direct fire, and retain an enemy outside the ditch.

Fig. 5 represents, in section, a row of fraises on the escarp. In this profile the ordinary banquette for musketry is represented by dotted lines below a wider terreplein, formed for artillery to fire over the parapet, or "*en barbette*," as it is usually called; but this will be more fully explained below.

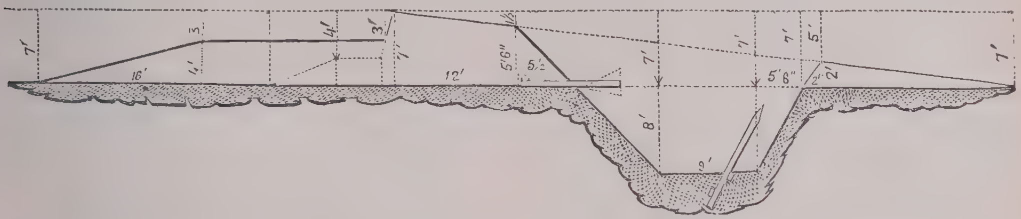

Fig. 5.—Profile showing Fraises on the Escarp.

The "Wire Entanglement" is the best and most easily made of hasty accessory defences. It can be applied everywhere, and can be made by anybody; the material of it is carried in a small compass; it does not interfere with the fire of the defence; it cannot be seen from a distance; and artillery has little effect upon it. A form of wire entanglement is shown in fig. 6. Stout stakes are driven into the ground 5 feet apart, and disposed in rows chequer-wise; strong wires are wound round them about 1 foot 6 inches above the ground, crossed diagonally by finer wires. No entanglement should be less than 36 feet in depth. The wires should hang slackly from their supports, as when strained they are easily divided by a sword-blow, and the stakes should vary in height. 14 B.W.G. steel wire is very suitable for the thicker wires; it is strong and weighs only 90 lb per mile. Wire entanglements in the bottom of a ditch offer a strong resistance. They are well placed in the slopes of the glacis and counterscarp and on the berm; but they are most effective when interwoven with bushes and trees in the defence of woods.

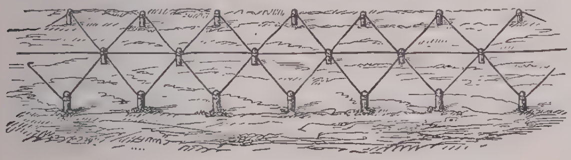

Fig. 6.—Wire Entanglements.

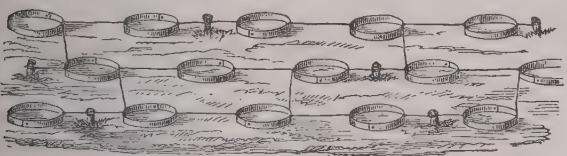

Fig. 7.—Gabions as an Entanglement.

Iron "band Gabions," when disposed as in fig. 7, form a good entanglement. The bands are buttoned and placed in lines 4 feet apart, and connected together by strong wires passing through the bridging holes.

Crows' Feet (fig. 8) are made of iron with four points so arranged that one shall always project upward in whatever manner they may be thrown on the ground; the points are either 2 or 4 inches long. Crows' feet are *sown* over a space about 12 feet broad. Troops coming suddenly, and in the dark, on these obstacles, would be much annoyed by them. They are most effective against cavalry, and were formerly much used,—more so than now.

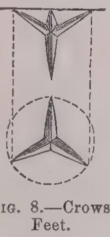

Fig. 8.—Crows' Feet.

Trous-de-loup are holes in the ground in the form of an inverted cone or square pyramid, the sides of which are as steep as is consistent with the stability of the soil. They are made 6 or 8 feet in diameter and 6 feet deep, so that an enemy cannot use them as shelter pits to fire from. At the bottom is fixed a sharp stake 3 feet long, or the branch of a tree cut into sharp points, or a number of smaller sharp pickets, or a quantity of crows' feet. Fig. 9 shows, in plan and section, the arrangement of trous-de-loup proposed by Wenzel.

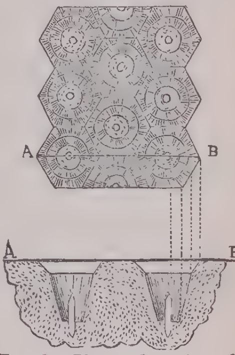

Fig. 9.—Plan and section of Trous-de-loup.

If along the line of a position, either on the glacis or on the escarp (when gradually sloped as in fig. 2), small trees or shrubs are planted, they can be on an emergency cut down, and with the points of their stumps sharpened they would become very annoying to an assailant. Harrows and many other substitutes can also be used; indeed every expedient which ingenuity can suggest should be adopted by the engineer to check the progress of an advancing enemy, and to delay him as long as possible under fire.

Stockades.—Before proceeding to the investigation of the principles which should regulate the relief and thickness of ordinary parapets, viewed in reference to simple defensive lines and to direct fire, it is right to notice the "Stockade" as a substitute, and in some circumstances an advantageous substitute, for a parapet. The Stockade is formed of one or more rows of stout palisades, and in its simplest form is thus constructed. A row of very strong palisades, usually pointed at the top, from 9 to 12 inches in diameter, is fixed deeply in the ground, with intervals of about 3 inches between the palisades. These intervals are filled by smaller palisades cut square at the top—every alternate palisade being shortened 4½ inches, so that the open space above it may be used as a loophole. A stout riband nailed horizontally to the upper ends of the palisades strengthens the construction materially.

Such a Stockade is shown in plan, elevation, and section in fig. 10; it has a banquette of earth, which may be replaced when desirable by a wooden step. By cutting out the triangular portion shown in the section, and throwing the earth up against the front of the palisades, as indicated by the dotted lines, an exterior slope and escarp are formed which keep an enemy constantly in view. A stockade of this description placed close to the edge of a steep bank, has this great advantage over a parapet, that the men behind it have a more effective command of the ground before them when firing through the loopholes than they could possibly have when firing over a parapet. It is here supposed that artillery fire cannot act directly against the stockade, but artillery may possibly be placed to act against it in a longitudinal direction, or, as it is termed, to enfilade it, and in this case the line of stockade should be interrupted by traverses, which are usually banks of earth placed transversely to the line they are intended to protect from such artillery fire. Fig. 11 shows a stockade of this description applied to the defence of precipitous ground. When stockades are formed into inclosed works, they are called "Tambours."

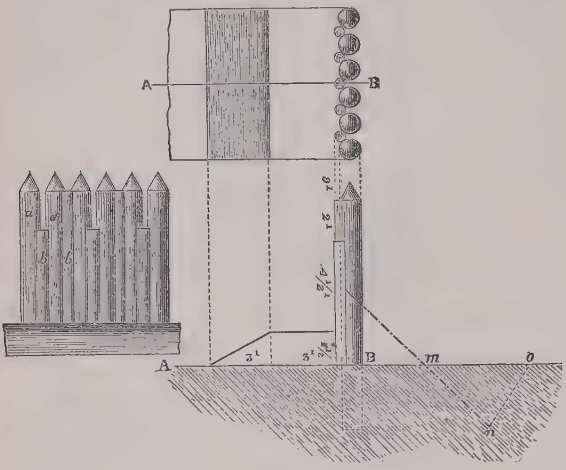

Fig. 10.—Plan, elevation, and section of Stockade.

Under some circumstances it may be desirable to throw an ordinary parapet forward to the edge of a bank, the slope of which supplies the function of escarp, and hence to dig the ditch behind instead of before it, as in fig. 12, where it will be also observed that the slope of the banquette is broken into two steps, the tenacity of the earth when first excavated allowing it to stand firm; the principle of this excavated form of structure is adopted in sunken batteries. Sometimes the object of the parapet is merely cover and not active defence, in which case the banquette is omitted as in fig. 13, and the work is called an "Epaulement." In this profile it will be observed that a space is left between the face of the epaulement and the internal ditch. Such a space should always be left, whether the ditch is within or without, when the work to be formed is of any considerable elevation, as it affords a stage upon which the builders can stand, and lessens the height to which the diggers have to throw the earth from the ditch; it is very important to keep this space clear by throwing forward or backward the earth as quickly as it is raised. The distinguishing characteristic of an able engineer is the power of varying his appliances—thus in his hands the abattis may become the fraise, or may take the place of the palisade, as in fig. 14. If this be not borne in mind, evil rather than good may result from adherence to systematic instruction; as the engineer who has acquired a knowledge of one contrivance may be found crippled by his constant efforts to conform to it rather than to seek some other better fitted to the circumstances of the case. In this profile a berm is represented, as it would be difficult to arrange the abattis and to build the parapets without it.

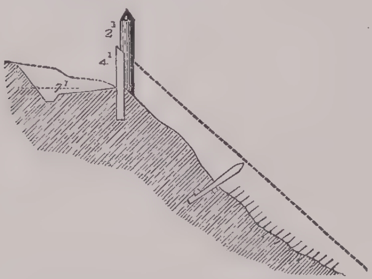

Fig. 11.—Stockade on steep ground.

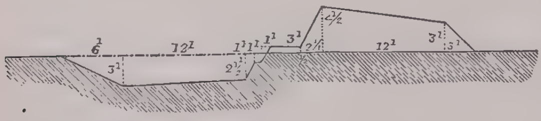

Fig. 12.

The arrangement of the trous-de-loup, combined with stakes driven into the ground is shown in fig. 15, an advanced glacis having been formed of the earth thrown out of the excavations. The ditch is in this case triangular; and it is scarcely necessary to add that the particular form of ditch must be determined by the nature of the ground, remembering that the contents of the ditches must supply material for the parapets; and their depth, as it adds to the difficulty of assault, should not be diminished except from necessity.

After these preliminary remarks, the student should be prepared to enter on the consideration of Field Fortification.

Rules for determining the Dimensions of Parapets.

Determination of the Relief of a Parapet.—First, where the ground is horizontal,—for the protection of troops in a normal position. The minimum for a simple parapet may be here stated at 6 feet 6 inches, as a musket ball would penetrate the parapet for a few inches below its crest, and the maximum at 8 feet, a height which gives the defenders perfect security under almost every circumstance of fire, including that from mounted soldiers.

Defilade.—Secondly, where the ground is uneven, and it is necessary to defilade the work from a point or points which command it.

Fig. 16 explains the first case, in which the points A, B, C, are on the same level, the distance AB being the space intended to be protected by the parapet at C. The line CF represents the supposed normal height at which it is presumed the assailants may fire, in this case 8 feet; BE will be the same; and AD cut by the line drawn from F to E will be 8 feet.

In fig. 17 A, B are still considered to be in one horizontal plane, but C is considerably elevated; and hence, adopting the same data as to height, and drawing the line FE and the line CB parallel to it, AD, or the height of the parapet, is equal to AI + ID,—ID being equal to BE, or CF, or N, the normal height. Calling also AB, or the distance to be covered, d, AH, or the distance from the commanding point, D; and HC, or the height of C above A and B, H,—we have AI : HC : : AB : HB; or AI : H : : $d : d + \mathrm{D}$; and hence

$$\mathrm{AI} = \frac{d}{d+\mathrm{D}} \cdot \mathrm{H}, \text{ and } \mathrm{AD} = \mathrm{N} + \frac{d}{d+\mathrm{D}} \cdot \mathrm{H} \quad . \quad . \quad . \quad (1);$$

so that the necessary height of the parapet increases as the height of the commanding point increases, or as the distance AB to be defiladed increases, and diminishes as the distance from the commanding point increases. Taking D = 600 ft., d = 30 ft., H = 60 ft., then $\mathrm{AI} = \frac{60}{21}$, or 2 ft. 10 in., and AD, the height of the crest of the parapet = 8 ft. + 2 ft. 10 in. = 10 ft. 10 in.; or taking D = 1200 ft., or 400 yards, then AD = 9 ft. 6 in.

Fig. 18 represents A lower than B by a quantity = AO = GH = h; hence AD = AO + OI + ID, and $\mathrm{OI} = \frac{\mathrm{OB.CG}}{\mathrm{BG}} = \frac{d}{\mathrm{D}+d}(\mathrm{H}-h)$,

$$\text{or} \qquad \mathrm{AD} = \mathrm{N} + h + \frac{d}{\mathrm{D}+d} \cdot (\mathrm{H}-h) \quad . \quad . \quad . \quad . \quad (2);$$

which shows that the deeper A is sunk below B and C the more elevated must be the parapet, and hence that this is a very unfavorable condition of parapet. For example, let A be 2 ft. below B, and all other data the same as before, then $\frac{d}{\mathrm{D}+d} \cdot (\mathrm{H}-h)$ = 2 ft. 9 in., and AD = 8 ft. + 2 ft. 9 in. + 2 ft. = 12 ft. 9 in.; or when D = 1200 ft., AD = 11 ft. 4 in.; and if it should be necessary to defilade a distance of 90 ft. instead of 30, the heights of the parapet would necessarily become 18 ft. 8 in., and 14 ft. 2 in.

Again, in figure 19, A is higher than B, and C is lowest of all; and if H still represents the difference of level of A and C, and h the difference of level of A and B, then

$$\mathrm{AD} = \mathrm{N} - h - \frac{d}{\mathrm{D}+d} \cdot (\mathrm{H}-h) \quad . \quad . \quad . \quad . \quad (3);$$

and, of course, so far as concerns the height alone of the parapet, this is the most favorable condition of all.

Any other case is easily resolvable by one or other of the formulæ;—thus, when A and C are on the same level, and B higher than A, H is 0, and equation (2) becomes $AD = N + h - \frac{d}{D+d} \cdot h$. And in equation (3), if B be higher than A, h becomes positive,

and $$AD = N + h - \frac{d}{D+d} \cdot (H + h) \quad . \quad . \quad . \quad . \quad (4);$$

or if h be 0, A and B being on the same level, $AD = N - \frac{d}{D+d} \cdot H$.

In equation (4), if the station C, though below A and B, falls between the horizontal line drawn through A and the line BR, or BA be prolonged till it cuts the surface of the ground sloping from B towards D, then $\frac{d}{D+d} \cdot (H + h)$ is less than h, and AD is greater than N; but should C be below the line BR, then $\frac{d}{D+d} \cdot (H + h)$ is greater than h, and AD is less than N; or, in other words, should the line of defilade passing through BA meet the ground at R within the prescribed limits of defilade, or the effective ranges of musketry and artillery, which may be now assumed as 800 yards for the first and 3000 yards for the second, then if the point C be above that line the parapet at A must be made higher than the normal height, and if below it may be made lower. A comparison of the examples under equation (2) will exhibit the great disadvantage to the defenders of simple lines of having any ground near to their own moderately elevated, and care should be therefore taken either to occupy such ground or to throw back the lines opposite to it as far as possible, and, should it have the character of a ridge, to bring some portion of the fire of the lines to act in the direction of its length. The space AB to be defiladed must depend upon circumstances; the minimum, to allow safe communication for the troops behind and actually defending the parapet, ought not to be less than 30 feet, but when it is necessary to draw up troops behind the parapet it ought not to be less than 90 feet; in cases of double lines or of inclosed works the distance must of course vary, as the object will be to protect, not only the troops near to the enemy from a direct fire, but the troops arming the more distant parapet from a reverse fire. In assuming the normal height as 8 feet, on the supposition that protection is required from the fire of mounted soldiers, a condition is assumed which is not generally likely to occur in the attack of intrenchments. Nevertheless, the command of a work should be sufficient to cover the defenders standing on the ground inside. Infantry are assumed to be 6 feet high, and to protect them, within a reasonable distance of the parapet, from projectiles clearing the crest and tending downwards in the latter part of their trajectory, the command of a parapet on level ground should be at least 8 feet. Shrapnel fire being effective at 3000 yards, and the elevation of the heaviest gun of position for a range of 3000 yards being 7°, the balls clearing an 8-feet parapet will strike the ground 18 yards in rear of the crest of the parapet. In equation (3), and in one case of (4), as explained, the height of the parapet becomes less than N, but should the diminution extend so far as to reduce the height of the parapet below 7 feet, the relief should be restored to its proper amount by excavating the ground behind the parapet, or, in other words, forming a terreplein below the level of the plane of site. In a similar manner, in equation (2), and in one case of (4), where the parapet becomes greater than N, it would be very inconvenient to augment the height above 12 feet, and it is preferable therefore to excavate behind the parapet, whenever the defilade requires so great an increase of height.

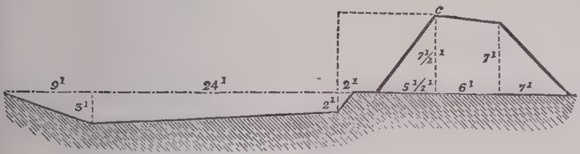

Fig. 13.—Epaulement.

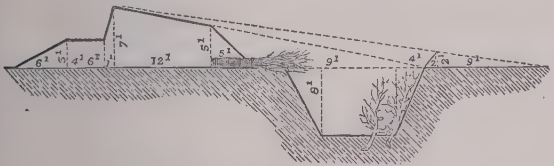

Fig. 14.—Use of Abattis as Fraise and Palisade.

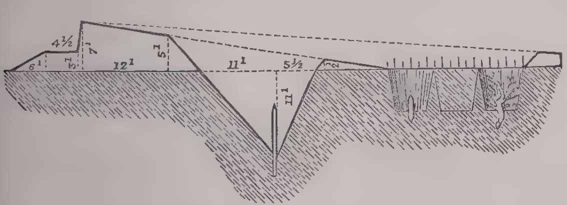

Fig. 15.—Trous-de-loup in front of triangular ditch.

In the preceding observations the parapet has been considered as a simple straight line, deriving its defence solely from its own direct fire; but such a condition would most frequently be found inapplicable, in respect of form, in consequence of the natural inequalities of the ground, and unsatisfactory, in respect of defence, in consequence of the imperfect operation of direct fire from the top of a parapet, which can strike the ground in front only in the prolongation of its superior slope, leaving everything within this defenceless; the line in which the superior slope meets the ground is called the "Limiting Line of Defence." A disposition of trace has therefore been adopted by which the fire of one portion of the parapet takes in flank an enemy advancing directly against the adjoining portion; and a work is said to be flanked when the arrangements are such that an enemy cannot advance against any portion of it without being taken in flank by the fire of some other portion. In lines of intrenchments this arrangement leads to a bent line, having angles projecting *towards* the exterior called "salient angles," and angles retired *from* the exterior called "re-entering angles;" and it is evident that in this arrangement the lines AB and AC (fig. 20), which are flanked by BD, CD, in their turn flank BD and CD; such flanking defence is called "reciprocal defence."

Referring back to the subject of defilade, it is evident that a bent line of this kind affords more facility for defilade than a straight line, as it is often possible so to arrange the position of the angles that the salients shall occupy higher ground, while the re-entering angles, though placed lower, shall be compensated for this disadvantage by being further removed from the commanding ground of the enemy.

Though a simple straight line has the disadvantage of depending for its defence solely on direct fire, it is not exposed to be swept along its whole length by an enemy's fire. Fire of this kind is called "enfilade" fire, and is very destructive; it produces the same effect upon the defence as flanking fire upon the attack, viz., it takes the defenders of the line in flank. To guard against this evil, should it be necessary to take up a position in front of ground of a superior command, the long lines AB, AC (fig. 20) should be so directed that their prolongations may fall on low ground at E, F, and not as they would do in the case of AB′, AC′, on the high ground at E′, F′; and, if possible, as where the high ground is not continuous, the prolongations of both short and long lines should fall on low ground between the commanding eminences, an arrangement which will be especially advantageous should the low ground be marshy or otherwise difficult of occupation by an enemy. Such observations as these are only suggestive, since no fixed rules can be laid down to meet all cases. The engineer should examine the ground and adjust his works so as to make the most of its advantages, and to neutralize, as far as possible, its disadvantages.

To determine the height of the parapet by the rules for defilade formulated above, it is necessary to have a correct plan of the ground, and to know the exact levels of the points A, B, C, in every case; but where there is no such plan, the defilading may be effected in practice by levelling poles or boning rods. In this case, the inner boundary of the ground within the parapet to be defiladed being staked out, a boning rod of 7 or 8 feet high, according to the intended normal height of the parapet, should be placed at B on the staked-out line, and another of equal height on the commanding point or ground C (fig. 21), supposed to be at a distance equal to the range of the projectiles from the fire of which the work is to be defiladed. A rod about 12 feet high is then fixed at A, and a cross piece or marker is raised up or down it until it meets the point where the visual line from the top of B to the top of C intersects the pole at A; this operation is simply the mechanical determination of the height obtained in the other method by calculation. If it be required to defilade the whole space between two parallel lines, or that included between the two lines forming the salient angle in fig. 20, it is evident that the work must be defiladed from both sides, and further, that the soldiers standing on the banquette of one line should be secured from the fire of the ground in front of the other, which fire is called *reverse fire*, because it strikes them in rear. This is effected by placing a mound of earth or traverse between them, and determining its height as well as the height of the parapets in the following manner:—

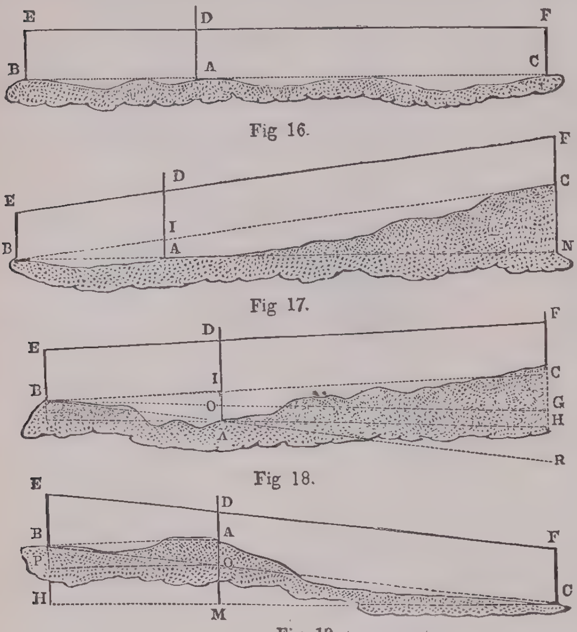

Fig 16.

Fig 17.

Fig 18.

Fig. 19.

Figs. 16–19 illustrate rules for different heights of Parapets.

On the commanding point C (fig. 21) is placed a boning rod CD of the normal height, and another BE of the same height at B, or at the position of the traverse; then the height of the crest of the parapet of A is determined by the intersection of the visual line from D to E with the pole fixed at A, at the point *a*, which is here high, as C is so much higher than A. See preceding rules and equations. In like manner a pole of the proper height being fixed at the extent of range on the opposite side at C′, the visual line from D′ to E determines the height, *a*′, of the parapet of A′, which is much lower than the parapet of A, as A′ and *c*′ are nearly on the same level. Now, to defilade the banquettes, and to determine the height of the traverse necessary for that purpose, set up on the banquette of A a pole *bb* of the same height as CD, C′D′, BE, and the visual line from D′ to *b* determines the height of the traverse at *f*, which is necessary to secure the banquette of A from the reverse fire of C′, whilst the visual line drawn from D to *b*′ determines the height of the traverse sufficient to protect the banquette of A′ from the reverse fire of C.

The application of these principles to a work formed of two lines (or "faces" as they are called), terminating in a salient angle is shown by fig. 22, but the application is the same whether the work is connected with a line of intrenchment as a "redan," is detached as in a "ravelin" and other outworks, or forms part of a peculiar system or arrangement of works, as in the tenaille system of Montalembert, called by its author the angular system,—terms and works which will be hereafter more fully explained. Here the commanding point is supposed to be at M, and to secure the defenders of the face AB from a reverse fire it is necessary to interpose the traverse *cd*, called from its object a "parados. The length of the traverse *cd* is determined by the line MB, beyond which it should project sufficiently to give ample security to a space about 50 feet wide behind the parapet. At the other end, the traverse is not carried up to the salient angle, as it would interfere with the communication, but is completed by *ba*, perpendicular to the other face, by which arrangement the space within the salient and the banquette is left free. The two lines M*d*B and M*cf*, passing through points at the normal height above the banquette, determine the height of the traverse. It may, however, happen that the commands are so situated as to give an enfilade fire along both the faces AB, AB′ (fig. 23). In this case a small work DAD′ is formed in connection with the parapet, by drawing lines parallel to the crests CB and C′B′ at a distance from them equal to the breadth of the banquette, and then determining, in the manner explained, the heights at A necessary to defilade a certain length of the banquettes of CB and C′B′ from the fire sweeping them, and assuming the greater of the two as the height of the parapet at A. This work is called a bonnette; and when the height necessary to defilade the whole of one or both faces is found to exceed 12 feet, the height of A should be restricted to that limit, and traverses T, T′, T² should be placed at such distances as shall defilade the remainder of the work.

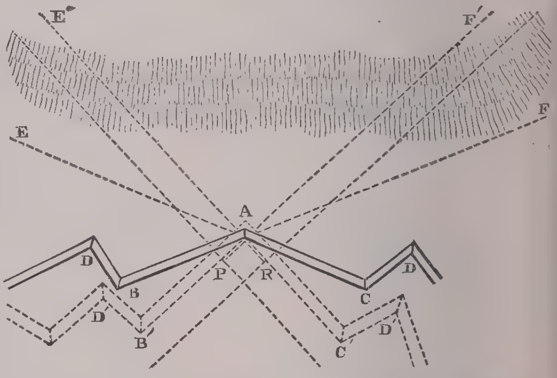

Fig. 20.—Illustrating defence against Enfilade Fire.

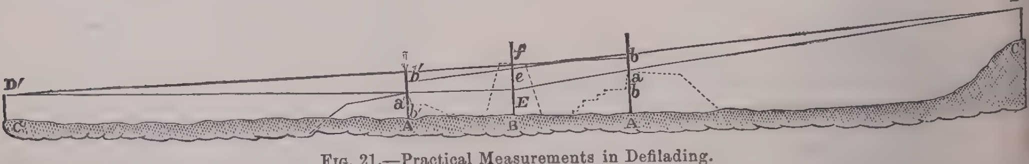

Fig. 21.—Practical Measurements in Defilading.

The internal space may frequently be sufficiently defiladed by raising the salient portion of the parapet without disturbing the line of direction of the crest; but in that case the banquettes of the two faces would not be covered from enfilade fire, and hence the necessity of a bonnette. The increased height of the parapet of the bonnette renders it necessary to adopt two banquettes *b*, *b*′, one below the other, and each provided with steps to facilitate ascent (figs. 23, 24). The operation of defilading may be also effected by *planes* of defilade; as, for example, if the line which marks out or limits the space to be defiladed be first drawn, and a plane be supposed to pass through a line either 6 ft. 6 in. or 8 ft.

(or whatever height between these may be assumed as the normal height N) above the limiting line, and through a point the same height above the commanding point, this plane will determine the height of the parapet, the crest of which will necessarily be in it.

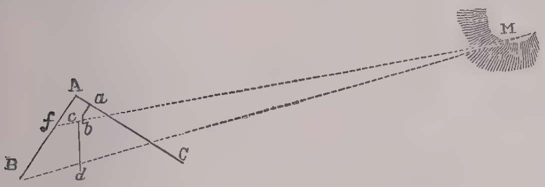

Fig. 22.

Where the parapet is continued not only on the flanks but also in rear, so as to form an inclosed work, it may often be necessary to defilade it in various directions as in fig. 25. Where two traverses or parados cross each other, they must, of course, be so placed that they shall not only completely defilade the whole interior space of the work, but shall secure from reverse fire the banquette on each side, the normal N being therefore at least 6 ft. 6 in. above the banquette. Where traverses of this kind become necessary, the engineer must take into account the space they will occupy, and plan his work accordingly; and should he be able to render the difficulty of attacking one side of his works very great, he may construct the traverses so that they may be used as retrenchments, and thus increase the means of defence; for example, S being the salient of greatest strength, *bcb* might be defended, and then *bcd*.

This subject has been enlarged upon because it is of much importance in military engineering, as the safety of a long line of works may be endangered by defective defilade. Though considered here in a practical form, it depends entirely upon geometrical principles, and instruction in descriptive geometry is therefore essential in all schools of military engineering.

Having determined the relief of the crest of the parapet in reference to the plane of site, all the other vertical dimensions follow from it, as shown in several of the preceding figures; whilst the horizontal dimensions are determined by the thickness necessary to resist the enemy's missiles and by the slopes required to ensure stability. The Penetration at a mean range into common earth after it has been dug up and well-rammed and into other materials is as stated below, and to these dimensions one half should be added for the thickness for security.

English Field Artillery.

Field Guns. M.L.R.		Penetration at 1000 yards with common shell.						Remarks.
Nature.		Earth.		Soft Wood.		Brick in Mortar.		
		ft.	in.	ft.	in.	ft.	in.	
16 Prs.	Shell.	4	6	3	0	1	9	These shells break up on hard masonry. The penetration into concrete is about two-thirds that into brick-work.
9 Prs.		3	6	2	3	1	6	
7 Prs.	"	2	0	0	10	0	6	

English Rifled Small Arm.

Weapon.	Projectile.	Penetration at 300 yards.—Inches.				
		Earth.	Soft Wood.	Brick.	Iron.	Steel.
Martini-Henry.	480 grs.	14	5	0·5	0·25	0·13

The penetration into sand is about two-thirds the penetration into earth, and about one-half that into clay.

The penetration into oak is about half that into fir.

With light, sandy, or gravelly soil, or, when ramming can only be imperfectly performed, greater thickness should be allowed; and as a wide and deep ditch must always materially strengthen the work before which it is placed, there can be no reason other than want of time, want of men, or difficulty of ground, for reducing the thickness of the parapet below 14, or at the utmost 12 feet. For forming the parapet under peculiar circumstances of difficulty the engineer will avail himself of every fitting substance which may be at hand, such as bags of wool, mattresses, fire-wood, manure heaps, and fascines, either by themselves or packed in gabions. The resistance of fascines is not great, their strength being rapidly diminished by the speedy fracture of their branches when exposed to sharp fire.

With these data it will be easy to regulate all the dimensions of the parapet,—the height of its crest, or the relief of the work, having been first established. Thus the banquette or step on which the men stand, when firing over the parapet, should for convenience be 4 ft. 3 in. below the crest. The breadth or tread should for a single rank be 3 ft., for a double rank 5 ft.; the surface should slope backwards 2 inches in the 3 ft., 3 inches in the 5 ft., so as to discharge water freely and keep the banquette dry; the base of the interior slope of the banquette up which the men mount should be twice its height; if the height of the parapet exceed the normal height, the banquette should have two treads or steps, the lower about seven feet below the crest, so that one rank of men may stand thereon whilst reloading the muskets of the rank on the step above them; or it should have three steps, each with a rise of 1 ft., and a tread of 1 ft., or 1 ft. 3 in., sloping slightly to the rear, by which arrangement the necessary excavation of the ditch will be diminished, and less of the interior space occupied. The interior slope of the parapet should be made very steep, so that a man firing over the parapet should be as close to it as possible; the base should not exceed one half the height; the superior slope, or "*plongée*," of the parapet, by which the fire is directed towards the point on which it is to act, should not be less than one-ninth, nor more than one-fourth of its thickness, and in service is generally made one-sixth; but as the increase of the slope facilitates the destruction of the crest, it should be kept as slight as possible. It is usual on the Continent to retain the angle of the crest, as a constant quantity, at 100°, and to increase the base of the interior slope as the plunge increases, and *vice versâ;* but this is not satisfactory, since, the height of the soldier's shoulder remaining constant whilst the line of plunge varies, the fire will not be always in the true direction; and it is preferable to keep the base of the interior slope as small as possible, and to make the top of the parapet at the crest horizontal for one or two feet commencing the plunge therefrom, but reducing the top as the plunge increases. This flat top will facilitate the use of sand bags (bags filled with earth), which are sometimes so arranged on the crest of the parapet as to form loopholes for the musketry, thereby adding to the cover of the men. The base of the exterior slope of the parapet should at least equal its height, though possibly in some soils—*e.g.*, chalk—the exterior slope may stand at a steeper angle than 45°. The slopes of the escarp and counterscarp should be as steep as practicable, but generally they will be the same as the exterior slope. Between the exterior slope and the escarp a "berm" is left. This berm is a space at least 1 ft. 6 in, wide and slightly inclined downwards and outwards for drainage; it

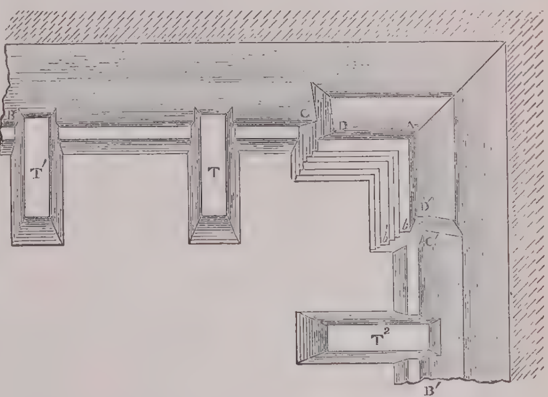

Fig. 23, showing Bonnette DAD′, and Traverses T, T′ T².

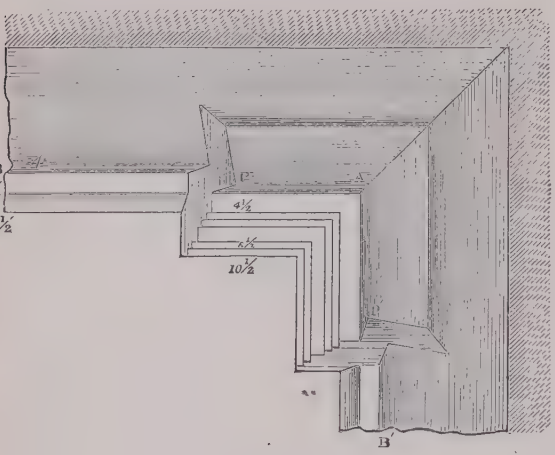

FIG. 24.

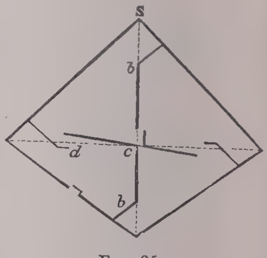

FIG. 25.

gives greater stability to the exterior slope and to the escarp, prevents the earth from the exterior slope from falling into the ditch, and is a standing ground for the repair of the parapet. Where steeper slopes are indispensable, the earth must be retained in place by a wall called a "revetment," which may be formed of fascines (long cylindrical fagots), hurdles, sods, planks, clay puddling, and, in the interior of works, of sand bags. The base of the interior slope of the glacis should be equal to its height, and the exterior slope should have a slope of 1 in 12. The command of the crest of the parapet over that of the glacis should be such that an assailant, standing on the crest of the latter, should not be able to fire into the interior of the work,—a condition which requires a command over the glacis of 5½ feet, so that with a parapet 7 feet high the *maximum* height of glacis would be 1½ feet. The minimum height of the glacis is determined by another condition, viz., that the fire from the parapet should pass at no greater distance than 2 feet above its surface; and in no case should the plunge or slope of the glacis be greater than that of the parapet. An advanced glacis is sometimes adopted either to render the cover more effectual, or to occupy a favorable line for first opposing the progress of the enemy. Fig. 26 shows this arrangement, gg^1, being the first or ordinary glacis, and g^2g^3 the second or advanced glacis. The slope of these glacis should not be such as to withdraw the assailants from the grazing fire of the parapet, and if it be not possible to extend the slope of g^2g^3 so far as to keep it in the prolongation of the line cg^2, it should be so arranged that no point of the slope should be more than 2 feet below that line or the plane corresponding to it, namely, the plane passing through the crest of the parapet and the crest of the advanced glacis. To form the advanced glacis, the slope at g is prolonged below the surface of the ground to g^1, the earth excavated in doing this supplying the material for the glacis. When it is intended that the defence of this advanced glacis shall be derived solely from the parapet, either an abattis or rows of stakes may be placed immediately behind it, so as to stop the advance of the enemy when at the point of maximum exposure, but advanced glacis may often assume the character of successive intrenchments, and be defended with vigor and success. This figure will be again referred to when treating on defence by mines. The height of the parapet being determined by the amount of cover required, and the thickness by the nature of the projectile to which it is exposed, the whole profile or section is necessarily completed on the principles pointed out, and the bulk therefore of earth contained in any portion of the parapet will be equal to the area of the mean or average profile multiplied by the length of that portion. Now, as this earth must be obtained from the ditch, the dimensions of the latter depend on those of the former; and the volume of any portion of the excavated ditch will also be equal to the mean section of that portion multiplied by its length.

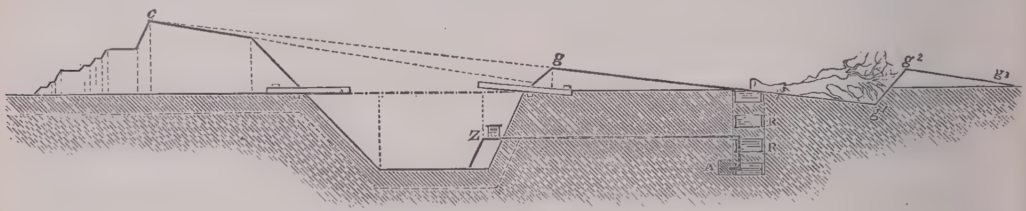

FIG. 26.

If, therefore, P represent the area of the mean section of this portion of the parapet, D the area of the mean section of the corresponding portion of the ditch, and L the length of this portion, then LP = LD, provided the earth be of the same bulk after as before excavation; but this is not the case, for after having been broken up from its previously closely packed condition, it is found that the "remblai" or earth built up exceeds the "deblai" or earth excavated by a coefficient varying with the nature of the soil, being in sandy soil nearly 0. Thus if $\frac{1}{m}$ represent the coefficient, in sand it is 0, in earth of medium tenacity $\frac{1}{12}$, and in very strong and naturally compressed earth $\frac{1}{6}$; so that to render the earth of the ditch just equal to that of the parapet, the above equation should be $LP = L\left(D + \frac{1}{m}D\right)$ and $P = D + \frac{1}{m}D$, or $D = \frac{m}{m+1}P$. As, however, the earth resulting from this excess, even allowing for the greater length of the ditch in polygonal works, will be required for forming the glacis, or for making up the banks, called "barbettes," in the salients constructed for raising guns sufficiently high to fire over the parapet, the dimensions of the ditch may be safely estimated without reference to the excess, as follows:—

Let x be the breadth of the bottom of the ditch, and y its depth; and let the sum of the bases of the slopes of the escarp and counterscarp be represented as a function of the depth by the fraction $\frac{r}{s}y$; then $x + \frac{r}{s}y$ will be equal to the breadth of the ditch at top, and $D = \frac{y}{2}\left(x + x + \frac{r}{s}y\right)$; whence $x = \frac{D}{y} - \frac{r}{2s}y$, and $y = \frac{s}{r}\left(-x + \sqrt{x^2 + \frac{2r}{s}D}\right)$. Now, as the defensive object of the ditch requires that it should be both deep and wide enough to form a decided obstacle to an enemy, the width ought not to be less than 18 feet, whilst the depth should have no other limit than that arising from the difficulty of raising the earth, which fixes 12 feet as about the maximum. Taking $y = 12$ feet, $\frac{r}{s} = \frac{3}{2}$, and $D = 108$ square feet, then $x = 9 - 9 = 0$, and the width of the ditch therefore $= \frac{3}{2}$ of $12 = 18$ feet,—the ditch being triangular.

Assuming a profile area of 70, corresponding to a parapet 7 feet high and only 6 feet thick, and making $x = 0$ for a triangular ditch, $y = \sqrt{\frac{2s}{r}D} = 9$ ft. 7 in., and the width of the ditch $= 14\frac{1}{2}$ feet; with a profile area of 116 feet corresponding to a parapet 7½ feet high and 12 feet thick, the depth of the ditch, if triangular, is 12½ feet, and the width 18¾ feet; so that this profile appears about the maximum for a triangular ditch with a profile area of 163 feet, corresponding to a parapet 8 feet high and 18 feet thick. With a banquette 4½ feet wide a triangular ditch would give $y = 14\frac{3}{4}$ feet, so that such a form would be inconvenient; but taking $x = 4$ feet as the width of the bottom of the ditch, y or the depth becomes 12 ft. 4 in., and the width of the top of the ditch 22½ feet—a very well-proportioned ditch.

In the preceding cases the base of the slope of the escarp has been assumed as equal to its height, and that of the slope of the counterscarp as equal to half its height. Should the nature of the soil be such as to require the base to be equal to the height in both escarp and counterscarp, $\frac{r}{s}y = 2y$; and should the soil be sufficiently firm to admit of a base of one-half in both, $\frac{r}{s}y = y$. In the first of these cases, even with the large profile area last named, the ditch may be made triangular with a depth of 12½ feet, and a breadth of 25 feet; and in the second a triangular ditch is inadmissible with a profile area of 116 feet, as the depth would be more than 15 feet; indeed it would be inadmissible with profile areas beyond 85 square feet, for which a depth of 13 feet would be required. Before leaving this subject, a few words may be said respecting the "berm." The most effectual escarp for defence is that which forms one continuous plane with the exterior slope, or at least which commences immediately where the other ends, as the absolute relief of the parapet is then a maximum, and there is no berm; but in many cases it would be imprudent to carry the parapet to the edge of the escarp, as injury to the latter would occasion the fall of part of the parapet, while the difficulty of construction would be greatly increased by having no intermediate stage between the bottom of the ditch and the top of the parapet. The "berm," or step between the top of the escarp and the bottom of the parapet, is made from 1 foot 6 inches to 4 feet wide, according to the nature of the soil, and it then becomes possible in some cases to increase the slope of the escarp to a base of one-half or two-thirds, or at least to such a slope as shall place the foot of the escarp in the prolongation of the exterior slope of the parapet. The berm is encumbered with obstacles to prevent an enemy from making use of it as a halting-place (see fig. 14). The slope of the counterscarp is usually one-third, one-half, or two-thirds, when that of the escarp is one-half, two-thirds, or 1; the bottom of the ditch should slope from the sides to the centre, to carry off the water, and obstacles should be provided there to prevent the enemy from collecting and reforming his men in the ditch, which, in all cases of simple lines, without flanking defences, he would do were it left free from obstructions.

FIELD FORTIFICATION.

The parapet has been hitherto considered principally in its character as the simplest element of defence, affording at once protection to the soldiers behind it and obstructing the advance of their enemies; but it is now time to consider the manner in which this parapet may be so arranged as to constitute a series of defensive and mutually defending works. If the antiquity of an invention be estimated by its position in the social history of the races of mankind, there can be no doubt that earthworks claim the priority over other forms of defence. In North America vestiges of circular earthen entrenchments, as well as of works of other forms, have been discovered, the antiquity of which is unknown; and in more recent times small parties of the aboriginal inhabitants encountering greater numbers of a hostile tribe have been known to excavate hollow spaces in the ground, and, throwing out the earth, to form around them circular entrenchments in which they have defended themselves to the last. In Ireland the ancient inhabitants have left similar relics of their earthen defences; in Great Britain there are numerous similar remains, the works of the Romans and of people long antecedent to the Romans; but the consideration of earthen works for the defence of extensive positions will be resumed further on, and such works will be considered here only in connection with the arrangements adopted by an army in the field for its own immediate security.

The art of constructing temporary works in the field for this purpose is called Field Fortification. This art is of very high antiquity; the Roman soldiers relied much upon such works, and executed them with wonderful rapidity, even in the presence of an enemy.

Shelter Trenches.—Of this art the simplest form is that in which troops are preserved intact until the moment of attack arrives. At first sight it would seem that this can best be effected by keeping them out of fire. The increase in the range of arms of all kinds has, however, become so great that it is no longer possible to keep troops out of fire and yet in a sufficiently advanced position from which they shall be able to attack promptly; hence it has become an absolute necessity to provide shelter for them.

A very shallow trench with the earth thrown to the front will afford to men lying in it cover against artillery fire, and a good rest for their arms when they have occasion to deliver their own fire. Moreover, it presents no obstacle to the advance of supporting troops, and offers but little mark to the enemy. Such trenches (figs. 27, 28, 29, 30) are called shelter trenches, and may be made of any depth or form according to the time and means available. They are very difficult of capture by the front attack, when defended by trained troops with breech-loading rifled arms, and can be quickly developed into regular intrenchments. The ordinary forms of shelter trench in use in the British army are shown in figs. 28, 29, and 30.

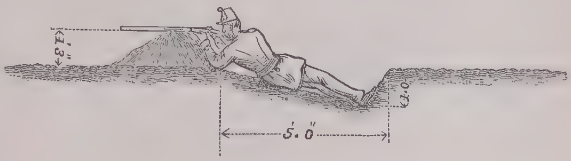

FIG. 27.—Shelter Trench,—constructed in 25 min. to ½-hour.

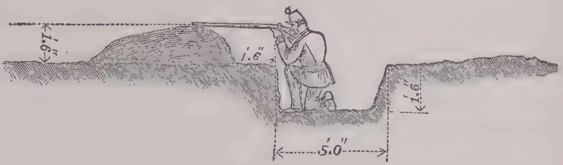

FIG. 28.—Shelter Trench,—1 hour.

The Russians made use of shelter trenches with great effect in the defence of Sebastopol, and since that siege their employment has steadily developed.

In more recent times the greatest use of hasty entrenchments, though perhaps in the form rather of a line of intrenchments than of shelter trenches, was made by the Americans in the war of secession. Wherever they halted, no matter how short the time at their disposal, they threw up shelter. Each man worked for himself, and as if by instinct, and before fires were lit or provisions cooked, an intrenchment of some kind was formed. Probably the Americans had acquired this habit in their campaigns against the neighboring Indians; and no doubt the superiority of rifled small arms, then for the first time freely used, thoroughly imbued them with a sense of the value of the slightest protection. General Sherman's campaign in Atlanta, and the actions in the neighborhood of Richmond and Petersburg, furnish numerous instances. With reference to them General Barnard reports that a simple trench defended by two ranks of foot soldiers is an obstacle unassailable by direct attack. General Wright relates that, attacking a handful of infantry, in single rank, behind a parapet and trench, with two divisions in line, the number of his casualties exceeded the number of the enemy, and

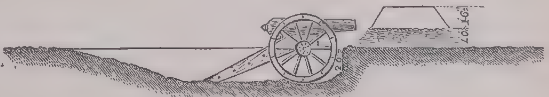

FIG. 29.—Shelter Trench,—1 hour.

that if the intrenchment had been defended by two ranks of good troops, a whole army corps could not have taken it. And in summing up his relation, he says that a simple trench, defended by two ranks of foot soldiers, covered by abattis and other obstacles placed so that the new rifled arms have full scope, is absolutely impregnable except by surprise.

After the fall of Nicopolis in August, 1877, 28 battalions of Turks, numbering about 10,000 men, collected at Plevna, and at once commenced to form shelter trenches; they were very deficient in artillery. Krudener attacked them four days after with 7000 Russians and 30 guns, and was defeated with a loss of 2800 men. Ten days later he again attacked with 30,000 men and 170 guns, but in the mean time the Turks had thrown up several redoubts, and had so extended their shelter trenches that their position was beginning to assume the condition of an intrenched camp; moreover, their strength had been swelled by reinforcements to 45,000 men. The Russians were again defeated with a loss of 8000 men. Six weeks later, upon the 30th September, Krudener, who had received 30 siege guns, having shelled the Turkish position for four days previously, attacked a third time with 50,000 Russians and Roumanians; but the Turks had in the interval received reinforcements of 10,000 men, and he was a third time repulsed with a loss of 15,000 men, though the Roumanians obtained possession of and held a large redoubt called Gravitza. It then became evident to the Russians that Plevna could not be taken by assault, and they commenced to besiege by rule. By the 24th of October they had completed the investment by the occupation of the Loftcha and Rahova roads, all of which were previously open to the Turks, and had brought into battery against it 300 guns, 40 of which were siege guns. By the 10th of December they had collected 110,000 men and 500 guns around Plevna; and shortly after, Osman Pacha, having been repulsed with a loss of 6800 men in an attempt to cut his way out, surrendered, and his whole force, amounting to 43,000 men and 70 guns, became prisoners of war.

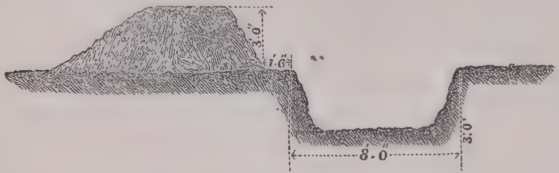

FIG. 30.—Shelter Trench,—3½ hours.

An army intrenched or fortified in the field is in many respects of the same effect as a fortress; the intrenchments supply the lack of numbers, and enable it to cover a country, to stop the advance of a superior enemy, or, if he chooses to risk a battle, oblige him to engage at a disadvantage. Charles V. furnishes a notable instance of the first. Opposed to a combined force of twice his strength, he at once commenced to intrench his army. In a few hours he was in a position to resist attack; in ten days he was so secure that, upon receiving reinforcements a few days later, he was enabled to assume an offensive which led in four months to the termimation of the campaign in his favor. "In a war of march and manœuvre," says Napoleon, "if you would avoid a battle with a superior army, it is necessary to intrench every night, and to occupy a good defensive position. The natural positions which are ordinarily met with are not sufficient to protect an army against superior numbers without recourse to art. Those who proscribe lines of circumvallation, and the assistance which the science of the engineer can afford, deprive themselves gratuitously of an auxiliary which is never injurious, always useful, and often indispensable."[1]

Whenever Napoleon had time and occasion for strengthening his position by field-works, he acted upon the principles recommended in the above extract, as almost all his predecessors had done. In the wars which followed the Revolution of 1688, in those of Queen Anne's reign, and during the Seven Years' War, we find the commanders of each period, William III., the duke of Marlborough, Marshal Villars, Marshal Saxe, Frederick II., and Marshal Daun, practically exemplifying their conviction of the great utility of field-works. Seven redoubts thrown up overnight saved Peter the Great at Pultowa, and enabled him to gain a decisive victory over his formidable antagonist; and at Borodino, three redoubts and eight flêches thrown up hastily by the Russians, caused the French great loss, and rendered the victory, which they gained by incredible efforts of gallantry, fatally costly; and it is not improbable that if the main redoubt had been closed at its gorge the French would have failed to take it. In 1761 Frederick the Great, having only 55,000 men to oppose to the united Austrian and Russian forces of 130,000 men, intrenched himself in the strong position of Bunzelwitz, in Upper Silesia, not far from Schweidnitz, which he held until the united armies were forced to retire for want of supplies. It has been argued by some that intrenchments and field-works have oftener been carried than successfully defended, and that hence incommensurate importance has been attached to them. But it should be remembered that victory in such circumstances has been purchased at an expense which has often rendered it in effect equivalent to defeat, and that a practice which the greatest commanders of ancient and modern times have approved and followed cannot be of doubtful utility. At Austerlitz, where the contending armies were nearly equal, Napoleon was preparing to superintend the construction of intrenchments when he found himself called upon to receive battle; and in Portugal, the duke of Wellington showed to what account the art of the engineer might be turned for influencing, not merely the fortune of a campaign, but the fate of a cause. The lines of Torres Vedras, which the powerful French army under Masséna was unable to pass, and from which the wave of war was rolled back broken into Spain, were perhaps the most remarkable works of the kind ever constructed.

"Lisbon," says Sir John Jones, "being situated at the extremity of a peninsula formed by the sea and the Tagus, it is plain that if an army be posted across the peninsula, no enemy can penetrate into the city without a direct attack on the army so posted. It was on this principle that the lines covering Lisbon were planned by Lord Wellington. Nature drew the rude outline of a strong defensive position, and art rendered it perfect. A tract of country thirty miles in extent from the mouth of the Zizandra on the ocean to Alhandra on the Tagus, was modelled into a field of battle; mountains were scarped perpendicularly, rivers dammed, and inundations formed; all roads favorable to the enemy were destroyed, and others made to facilitate the communications of the defenders; formidable works were erected to strengthen and support the weak parts, whilst numerous cannon, placed on inaccessible points, commanded the approaches and gave an equality of defence to the whole position."[2] These lines were not continuous and connected works; they consisted of independent forts, redoubts, flêches, redans, batteries, so placed as to command and enfilade every approach, and to support each other by a cross and flanking fire. The first line occupied a front of twenty-nine miles between the sea and the Tagus, and by means of telegraphs intelligence could be conveyed from one extremity to the other in a few minutes; whilst the troops, disposed in masses in the rear of the works, were ready to move upon any point of attack by interior communications shorter than any by which the enemy could advance. "The aim and scope of these works," says Colonel Napier, "was to bar the passes, and to strengthen the fighting positions between them, without impeding the movements of the army. These objects were attained; and the loss of the first line would not have been injurious, save in reputation, because the retreat was secure upon the second and stronger line, and the guns of the first were all of inferior calibre mounted on common truck carriages, and consequently, immovable and useless to the enemy."[3] The two lines covered an extent of fifty miles, on which were erected one hundred and fifty forts, mounting in all about six hundred pieces of artillery.

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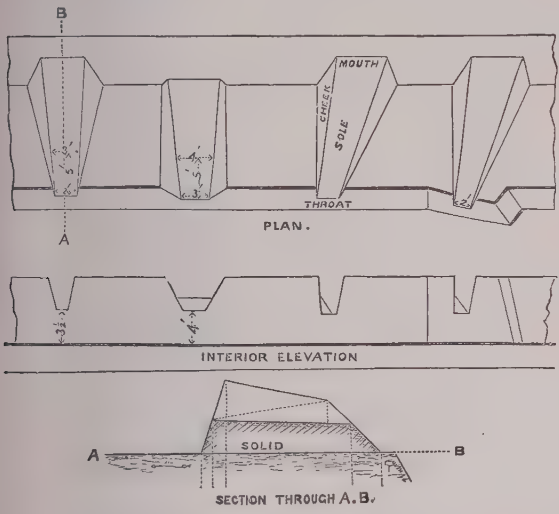
[1] *Military Maxims of Napoleon.*

[2] *War in Spain*, p. 124. The French army which invaded Portugal under Masséna consisted of three corps, under Marshals Ney and Junot and General Regnier, amounting in all to 66,000 infantry and 6000 cavalry, besides a strong body of the imperial guard, which crossed the Pyrenees after the invading force had commenced its march from the neighborhood of Salamanca. The force collected to oppose this threatened invasion did not exceed 48,000 infantry and 3000 cavalry, of which about half were Portuguese levies, yet untried in any general action, and of which a very unfavorable opinion still continued to be entertained. In point of numbers, and still more in the composition of their army, therefore, the French had a decided superiority; but all their advantages were neutralized by the defensive position of Torres Vedras.

[3] *History of the War in the Peninsula*, vol. iii.

Before this formidable position, defended by a double line of works, and by an army massed and ready to move upon any point by interior communications, the French remained five months, wasting their numbers and resources; until at length, finding it utterly impracticable to force any part of even the first line, they were obliged to retire from Portugal, closely followed and harassed by the army which they had previously driven out of Spain. Yet perfect as were the lines of Torres Vedras, and though one of the ablest of the French generals and a veteran French army were foiled before them, it is not meant to infer that the system of separate field-works is a model to be followed on all occasions; for, though the old method of covering a considerable front by a continued line of regular bastions and curtains has been generally condemned by modern engineers, there may be situations where the application of continued lines may be judiciously made. There is no fixed rule; the nature of the ground and of the position to be defended must determine the proper description of works.



PLAN.

INTERIOR ELEVATION

SECTION THROUGH A.B.

Fig. 31.—Embrasures.

But as in defence artillery should be combined with musketry, it is necessary that in the arrangement of lines provision should be made for the use of cannon; and as they should be preserved for action at the right moment, they should, when practicable, be mounted on carriages of such a height as will enable them to give their fire over a full parapet, the gun and carriage disappearing below the parapet after the fire is given, so that the loading may be effected in security. In particular cases, such as in flanks where the lateral range of the guns is restricted, and where the guns are not exposed, or are exposed to indirect fire only, openings in the parapet called "Embrasures" may be made use of, but they have many serious disadvantages:—they weaken the parapets; they offer distinct marks to the enemy; they are easily blown down by shells; they are destroyed by the fire of their own guns; they are difficult to construct, and still more difficult to maintain. The interior opening called the "Throat" of the embrasure is made wide enough to admit the muzzle of the gun, about 20 inches; the width of the outer opening called the "Mouth" is determined by the lateral range of the gun, which should not exceed 20°. The slope of the bottom of the embrasure, called the "Sole," is determined by the object upon which the fire of the gun is to be directed. When required for indirect fire only, the sole is made countersloping; by this arrangement the exposure of the gun detachment is considerably lessened, and, in order to diminish still further this exposure, the sides of the embrasures are made with a winding slope,—steep at the throat, from 6 to 1 or less, and flattening out at the mouth to 1 to 1. As a rule, embrasures should not be made till they are required, so that the parapet may be made solid in the first instance (see fig. 31).

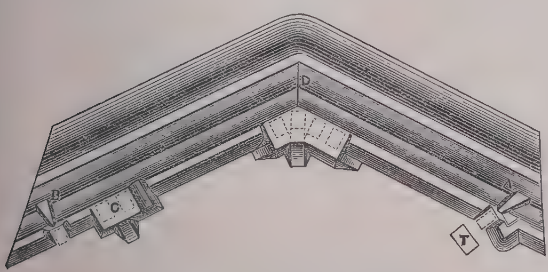


Fig. 32.—Embrasures and Barbettes.

The portion of parapet below the embrasure is called Genouillère (from *genou*, the knee), and should be 2 feet 5 inches high; the portion between two embrasures is called a Merlon, from the Italian *merlone*, a battlement; the bottom of the embrasure is called its Sole; and, as has been suggested in respect to the superior slope of the parapet, it may be horizontal for the first two feet from the neck, and then slope downwards as much as may be necessary for the depression required in firing. The direction of the embrasure depends on the direction of the line of fire; it may be either perpendicular to the crest or oblique. In the latter case, should the obliquity be very great, or exceeding 70°, the crest of the parapet must be made re-entering, so as to strengthen it near the neck, and to enable the gun-carriage to be brought up square to the parapet. The sides of the embrasure are called Cheeks, and should be revetted with sods, fascines, gabions (cylindrical baskets made of wicker, and filled with earth after they are in position), sandbags, planks, or hurdles. In fig. 32, on the left, at B, a direct embrasure is seen cut straight through the parapet; and on the right at A, an oblique one, both being intended to enfilade the ditches opposite them; and it will be observed that, from the obliquity of the right-hand embrasure, the interior of the work becomes so much exposed, that a traverse, T, behind the embrasure, becomes necessary. Barbettes are also shown in this figure—one at the salient at D for four guns, and another at C, perpendicular to the face, for two. The terreplein of the Barbette should be $3\frac{1}{2}$ feet below the crest of the parapet; its length from front to rear from 18 feet to 20 feet; and its breadth, for a single gun, from 15 feet to 18 feet, according as it may be necessary to fire more or less obliquely; a breadth of 15 feet should be added for each additional gun. To add to the lateral sweep or range of the gun, without diminishing the banquette, or, in other words, the musketry fire, the barbette may be made wider in the rear than in front. In proportion to its magnitude should be the number of "*Ramps*," or slopes of approach; as, for example, at C only one, at D three. The ramps should be from 8 to 9 feet wide, and their slopes should have bases equal to 4 times the heigh of the barbette. The lateral slopes of the barbette and of its ramps should be revetted whenever it is

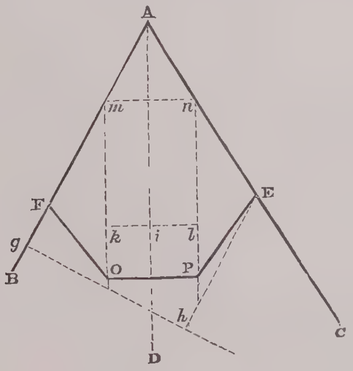


Fig. 33.—Construction of a Barbette in a Salient.

possible to obtain sods, fascines, hurdles, or other materials suited for the purpose, in order to economize space in the work, as the base of the slope may be then reduced to one-fourth or one-sixth the height; when unrevetted they have slopes of one-sixth. The terreplein of the barbette may require, as at C, to be covered in flank by a traverse. The mode of constructing a barbette in a salient is exhibited in fig. 33.

At any point *g* of the face AB raise a perpendicular *gh*, either 18 or 20 feet in length, to include the amount of recoil; at the point *h* thus determined raise a perpendicular to *gh*, and prolong it to its intersection with the other face AC at E, then setting off AF on the other face equal to AE. On the capital AD set off a double perpendicular at any point *i*, prolonging it both ways, and making *ik* and *il* each at least equal to 4½ feet to represent the half breadth of the platform on which the gun-carriage is intended to stand and move; through the points *k* and *l* draw parallels to the capital, cutting the faces on the points *m* and *n*; join *m*, *n*, and parallel to the line *mn* draw the line OP at 18 or 20 feet distant from it, when *mn*PO forms the platform. Join FO and EP, and AEPOF will represent the contour or trace of the barbette. The manner in which the crest of the parapet is formed above the salient A, and the mode in which the firing may be effected in directions perpendicular to the faces, as well as in the direction of the capital, are shown in fig. 34.

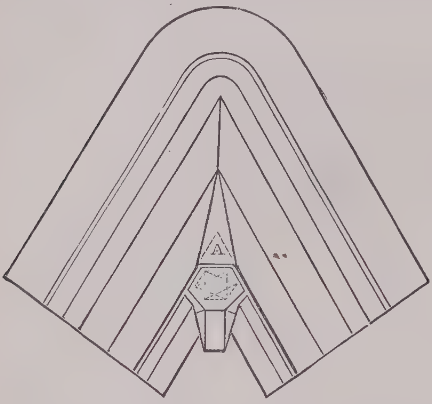


Fig. 34.

In the case of a partly sunken parapet, in which the portion above the banquette is raised above and the portion below the banquette excavated below the plane of site,—as in fig. 35, the barbette constructed in the hollow portion will enable the gun to fire over the parapet; and it should be protected by forming a bonnetted embrasure, which may be sometimes made large enough, as here represented, to hold two guns. It need scarcely be added that an engineer ought to be ready to adapt any of the expedients here briefly noticed to the circumstances of the case before him, and that a mind stored with resources against any contingency is the highest endowment of a good officer. It must be obvious that in Field Fortification even a limited knowledge of the art of war opens a wide field for the exercise of the talents and resources of engineers; but the possession of a military coup-d'œil, which comprehends at a glance the true bearing or character of objects and events is necessary for the conversion of stores of information to the best practical uses. In passing through a country, it requires an experienced eye to seize quickly on whatever it presents calculated to prove advantageous or disadvantageous for attack or defence; to appreciate the value of villages, inclosures, and broken ground; to know where to dam up rivers, to scarp heights, to form abattis, trous-de-loup, and other obstacles; to select the best situations for field-forts and redoubts, and the best sites for batteries; and to arrange the defensive measures with reference to the number of troops disposable, so that the movements of the defenders may not be obstructed or retarded, and their communications may be short and easy. The variety of ground upon which military operations must be carried on precludes the possibility of laying down fixed rules in regard to this subject; the accidents of the ground, and the peculiar circumstances of each individual case, must determine the extent and description of the works to be constructed, as well as the obstacles most proper to be formed for retarding the advance of an enemy.[1]

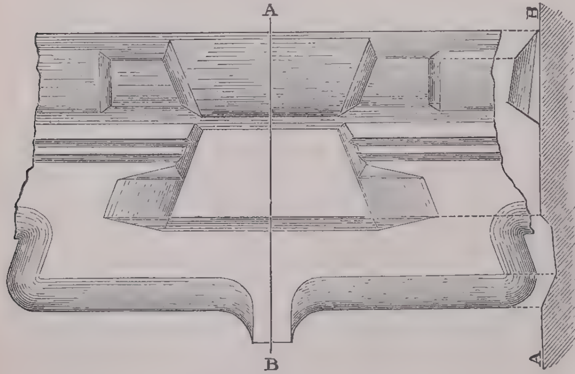


Fig. 35.

But though the observance of fixed rules be impracticable, general principles are of universal application; and certain maxims founded upon them hold good in the construction of field-works as much as in the erection of the complicated works of a fortress. These maxims, which are of invariable application, are—(1) that the works to be flanked must never be beyond the range of the projectiles used in the works flanking them, or, in other words, that the length of the lines of defence must never exceed the effective range of the weapons in use; (2) that the angles of defence must be about right angles; (3) that the salient angles of all works must be as obtuse as possible; (4) that the ditches must be efficiently flanked; (5) that the relief of the flanking works must be determined by the length of the lines of defence; and (6) that the works must be constructed with reference not only to the direct and immediate obstacles which they present to the enemy, and to the positive effect of their fire on the approaches to them, but also to the support they derive from or afford to other works.

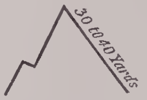


Fig. 36.—Redan.

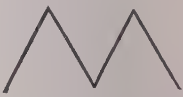
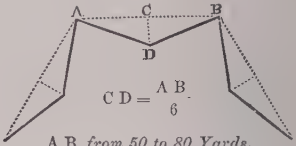


Fig. 37.—Double Redan.



$$CD = \frac{AB}{6}$$

A B *from 50 to 80 Yards.*

Fig. 38.—Tenailled Heads.

Field-works are either open at the gorge as in figs. 36, 37, 38, 39, or inclosed all round as in figs. 40, 41, 42, 43. They are of the following kinds:—

Redans, or simple heads	fig.	36.
Double redans, or queues d'hironde	"	37.
Tenailled heads	"	38.
Bastioned heads	"	39.
Redoubts	"	40.
Star forts	"	41.
Bastioned forts	"	42.
Demi-bastioned forts	"	43.
Lines of redans	"	44.
Lines of tenailles	"	45.
Lines à crémaillère	"	46.
Lines of bastions	"	47.
Lines broken or with intervals	"	48.

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[1] Shaw's *Course of Field Fortification*, p. 9 *seq.* Much assistance has been derived from this useful work in the compilation of this article, as well as from the admirable treatise on *Field Fortification*, by Fischmeister, translated by Rieffel into French, the figures of which have been freely used.

The first class are of the simplest kind of field-works, and serve as cover in front of avenues, bridges (see fig. 49), causeways, and the like; being open at the gorge, they are only used when their extremities rest on rivers, or on obstacles which prevent their being turned, or when within the full sweeping fire of works in their rear. To increase the strength of a "Redan" its faces are sometimes broken into a kind of flank, as in fig. 36. In the "Double Redan," or "queue d'hironde," fig. 37, the re-entering faces defend each other. "Tenailled Heads" (fig. 38) are used in situations which require a greater extent of front. "Bastioned Heads" (fig. 39) are also employed in similar circumstances.

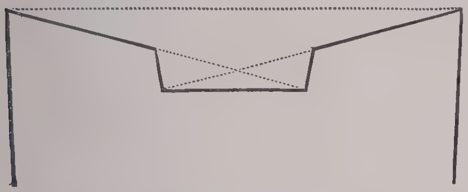


FIG. 39.—Bastioned Heads.

"Redoubts" (fig. 40) are closed works of square or polygonal figure. In square redoubts provision should be made for defending the ground before the angles, which, however, are sometimes rounded or cut *en crémaillère*, so that a direct fire may be delivered from them.

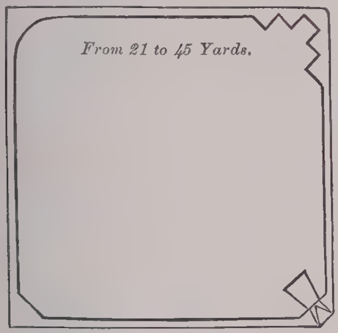


FIG. 40.—Redoubts.

Half-closed Redoubts, that is redoubts in which the gorges are closed by thin parapets or timber stockades, may more fitly be classed here. They are employed when it is intended that their interior shall be open to artillery fire, so that an enemy having captured may not be able either to retain them or to convert them to his own uses.

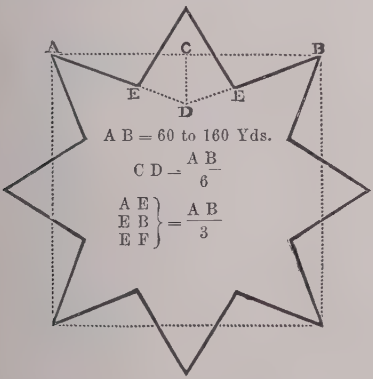


FIG. 41.—Star-Forts.

Forts are works the parapets of which defend the ditches, and this distinguishes them from redoubts, the parapets of which do not.

"Star-Forts" (fig. 41) are designed to deliver a cross fire from the adjacent sides; but according to Jomini, they are the very worst description of fortification; they cannot have flanks, and the re-entering angles take so much from the interior space that it is impossible to place troops and artillery in them sufficient for their defence, an opinion confirmed by the practice of Sir Richard Fletcher and Sir John Jones in the construction of the lines of Torres Vedras, where the trace of the redoubts was varied to suit the conformation of the ground.

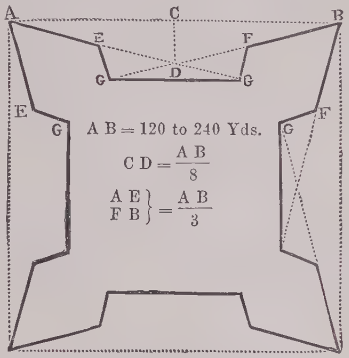


FIG. 42.—Bastioned Forts.

In "Bastioned Forts," fig. 42, the flanking defence afforded by the parapets to the ditches is nearly perfect. As bastioned forts are only constructed in special cases of importance, no labor or expense should be spared in their formation. The bastioned face may be applied to any polygon provided that its angles are not less than 90°. When the angles are less than 90° the salients of the bastions are too acute.

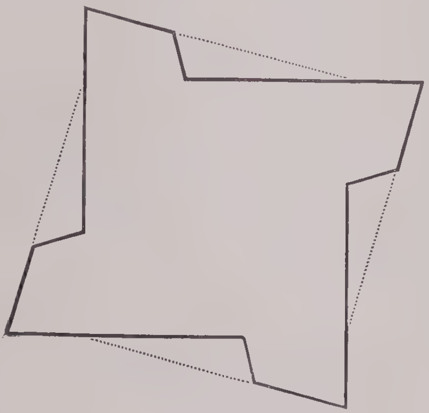
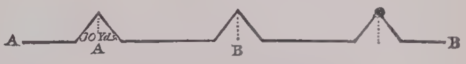


FIG. 43.—Demi-bastioned Forts.

"Demi-bastioned Forts" (fig. 43) inclose a greater interior space than Bastioned Forts, but a portion of their ditches are only defended by an oblique fire from the parapets of their faces.

The parapets of all these works should be of sufficient thickness to resist the fire of the heaviest guns that can be brought against them. In some cases it will be necessary that the parapets should be strong enough to resist the fire of light field-guns, whilst in others it will be sufficient if they serve as a cover to the men within them against musketry. This latter cover is that which, when time for more does not avail, is thrown up at the close of a march, after taking up a position, and which, if the army does not

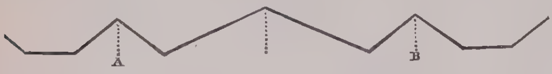


AB varies from 180 to 400 yards.

FIG. 44.—Lines of Redans.

move next day, may be strengthened in parts, according to circumstances.

Continued Lines, or connected works, are resorted to in order to inclose the front of a position, or to connect important works or forts. The most simple trace is that of redans joined together by curtains (fig. 44); the ditches of these curtains can only be defended by an oblique fire from the faces of the redans, but this defect may be remedied by breaking the curtains so as to form nearly right angles with the faces of the redans, in which case they are called "Lines of Tenailles" (fig. 45).



AB varies from 300 to 600 yards.

Fig. 45.—Lines of Tenailles.

"Lines en Crémaillère" have long faces, with flanks perpendicular to them, in order to defend their ditches (fig. 46). When the faces can be directed towards ground upon which it is impracticable to establish enfilading batteries, this trace is good.

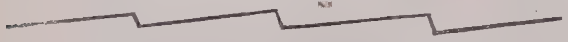


Fig. 46.—Lines en Crémaillère.

Bastioned Lines (fig. 47) form the strongest trace which can be given to continued lines, when the ground will admit of its adoption. A perfectly regular trace can only be applied to level ground. The ditches in field-works are often sloped *en rampe* towards the adjoining flanks, in order that the "deblai," or quantity of earth excavated, may not exceed the "remblai," or quantity in the mass of the rampart or parapet, a condition which might otherwise occur in field-works, where there is seldom any rampart, and only cover sufficient for the defenders.

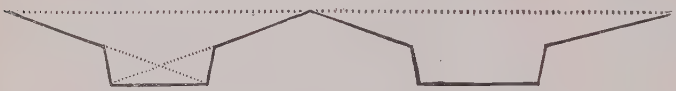
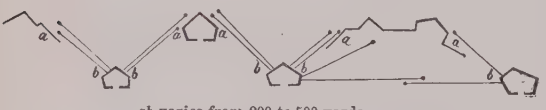


Fig. 47.—Lines of Bastions.

Fig. 48 shows the general trace of "Lines with intervals."



ab varies from 200 to 500 yards.

Fig. 48.—Lines broken or with intervals.

The salient works should never be beyond the range of musketry from the re-entering works, and the angles of defence between the two lines should be as nearly right angles as possible.

"Têtes-de-pont," or Bridge-heads, are works, open at the gorge, whose flanks rest upon a river, designed to cover one or more bridges. The best situation for these works is the re-entering sinuosity of a river. As Têtes-de-pont (fig. 49) are usually constructed for the purpose of enabling a retiring army to cross a river in order, and to check an enemy pressing upon it, their trace and profile should be such as to secure this double advantage to the greatest extent possible. In Sir Howard Douglas's able work on the *Construction of Military Bridges* will be found much valuable information upon this important subject.

The obstacles which are usually added to field-works, in order to render the approaches more difficult to the enemy, such as shelter trenches, entanglements, palisades, barriers, abattis, trous-de-loup, chevaux-de-frise, harrows, and crows' feet, have been already described.

Defence of Open Towns and Villages (fig. 50).—To admit of a town being advantageously intrenched it is necessary that it should not be commanded within range of field-guns, that its houses should not be of a construction easily set on fire, such as of wood with thatched roofs, and that its extent should not be out of proportion to the means and time at the disposal of the defenders. The last consideration is of much importance and should be well weighed, as this kind of defence is prodigal of men. It is however rapidly organized; and, as the number and the nature of the troops allotted to it are effectually concealed, it is susceptible of being prolonged obstinately. When time presses the first step is to occupy the outer inclosures and to bar the principal thoroughfares upon the enemy's side, to construct abattis and shelter trenches, to loophole the buildings flanking the barriers, and then to form a strong "shooting line" behind the outer inclosures, clearing enough of the ground in rear to receive the supports and reserves, and to enable them to act efficiently either in assisting to expel the enemy or in covering the retreat. The approaches to the "shooting line" should be cleared for a distance of at least 300 yards, by levelling houses, hedges, shrubberies, filling ditches, and clearing away whatever may favor the assailants. Wood should be cut down about 2 ft. 6 in. above the ground, and with wire or other means formed into an entanglement; hedges may often be so formed into most effective entanglements. The squares and open places should be occupied by the main reserves; the main approaches should be subjected to artillery fire; and distinct communications should be formed for the retreat of the defenders of the "shooting line." The inclosure round the town should be completed, and for this purpose some houses should be removed, others should be loopholed, streets should be barricaded, secure places found for the magazines, and cover provided for the main supports and reserves, and wide and easy communications laterally and to the rear should be made. Streets leading out of town should be barricaded. The barricades should be sufficient to resist field artillery, and high enough not to be easily surmounted; and they ought to be flanked by loopholing the neighboring houses. When time presses, carts filled with dung with the wheels removed, sand-bags, bales of wool or cotton, and furniture taken from the neighboring houses can be used as barricades. A church, a manufactory, a town-hall, a market, or any large substantial building should be converted into a keep, by blocking up useless entrances, loopholing its walls, and surrounding it by a ditch or abattis. Loopholes are slits or notches cut in walls with such tools as may be at hand. They are usually about 3 inches wide and 12 inches long externally, and are splayed internally so as to allow variation in the direction of the fire. Loopholes are cut vertically or horizontally as the case requires, and are much used as temporary means of supplementing the cover afforded by the parapets of temporary and permanent works; they are then formed of any materials at hand, such as sand-bags, logs of wood, and brush-wood. Sand-bag loopholes are the best, as the whole loophole is not necessarily destroyed by the blow of a projectile, and they are easily moved from place to place; two sand-bags are placed side by side with an interval between them, and a third covers this interval. Logs of wood are disposed similarly; brushwood or board loopholes are embedded in the parapets. If a town is situated near a stream or river, by which part of it may be covered by inundations, the resources this affords should never be neglected.

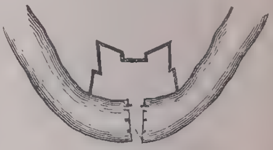


Fig. 49.—Tête-de-pont.

Villages are intrenched on similar principles, and being generally surrounded by gardens with live hedges, the latter may be made use of in the lines of defence. If there should only be sufficient troops to defend part of a village or town, a part of it only should be intrenched, and should be separated from the rest by means of carts and barricades. If there are very few houses, it may be necessary to confine the defence to the church or churchyard. Villages are often in one long street; then only the rear portion is intrenched, clearing in front of this portion a space sufficient for the effective action of musketry.

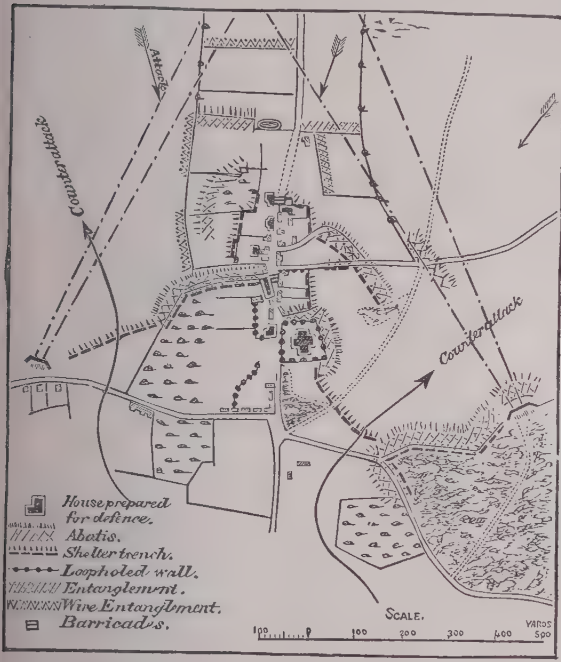


Fig. 50.—Illustrating Defence of Towns or Villages.

The Destruction of Bridges.—Nothing is of greater consequence to a retreating army than to destroy the bridges in its rear, in order to retard the advance of the enemy. Its existence may depend upon the success with which this operation is performed. To destroy a stone bridge with gunpowder a trench in the form of a cross is made in the crown of the arch, the branches of which are about 10 feet in length, and sunk to the top of the arch-stones. For an arch 3 feet thick, 160 ℔ of powder are placed in each trench; strong planks are then laid over the powder, and covered with rubbish. The fire is communicated by means of powder-hose or Bickford's fuze. Stone bridges are destroyed also by simply cutting a trench about 18 inches deep across the crown of the arch, and placing in it 345 ℔ of powder covered in the manner just described. This quantity has been found sufficient to destroy semicircular arches of 25 feet span, and of 3 feet in thickness at the key. Wooden bridges may be destroyed in various ways; they may be pulled to pieces, burned, or blown up. When there is time to take them to pieces, they are unspiked, and the timbers so separated that they may be speedily removed. The best method of burning such bridges is to tar them, and then to cover and surround them with fascines or tarred brushwood. Wooden bridges may be blown up by large charges of powder suspended under the superstructure, and fired in the manner above described. But these and other hasty demolitions may be more quickly and more certainly effected by the use of Compressed Gun-cotton, which is, weight for weight, four times as strong as gunpowder, and requires no tamping. Compressed gun-cotton is stored damp, and in this state it is perfectly safe for transport and handling, as it can only be detonated by the agency of a small quantity of dry gun-cotton, called a primer, and a detonator. The detonator is fired in the ordinary way or by electricity. Compressed gun-cotton is made in many convenient forms and sizes, such as 1 oz. and ½ oz. discs, 1 ℔ or 2 ℔ slabs, pellets, and grains. Generally it should be evenly distributed over the surface of stone bridges—if heaped, it forces an opening clean through. Supports of timber bridges may be destroyed by a girdle of half-ounce discs tied round them; or, if time avails, by charges placed in auger holes bored in them; ½ oz. of gun-cotton is sufficient for each square inch of the sectional area of the support. Iron bridges are destroyed by attacking the bottoms of the piers, or, in the case of girder bridges, the junction of 2 girders; 2 ℔ of compressed gun-cotton per foot lineal laid against an 18-inch brick wall will destroy it,

A ford is rendered impassable by throwing large stones into it, by sinking boards with spikes standing upright in them, or by placing crows' feet or harrows in it. A low rubble wall may be formed across it, so as not to be perceptible above the water; strong stakes may be driven into the bottom, and trees fastened to them; wagons loaded with stones, with the wheels removed, may also be employed; and a number of other things which may often be found at hand will answer the purpose equally well. Rendering a ford impassable is only second in importance to the destruction of a bridge, when the enemy, whose progress it is desired to retard, either has no pontoon-train, or has outstripped it by the rapidity of his advance. By such expedients to retard the pursuit much valuable time may be gained by the retreating army.

The essential characteristic of all intrenchments which are formed of earth is that the musketry fire, on which the defence must mainly depend, being discharged over the crest of the parapet, the line of fire will be nearly in the plane of the superior slope of the parapet, and perpendicular to the line of its crest; and hence opposite a salient angle, as in the Redan (fig. 51), there will be a large space of ground in this case extending over 180° − 60° = 120°, undefended by the fire of the work itself; this space is called a "dead angle." Opposite re-entering angles, on the other hand, the defect is of a different kind, as the plane of the superior slope or plane of fire passing high above the foot of the escarp necessarily leaves it unseen and unprotected, notwithstanding that the two lines theoretically flank each other. The object, therefore, in arranging field works for mutual defence should be so to regulate their reliefs that the lines of defence should terminate at such distance from the ground as to give effective defence to the parts of the works intended to be flanked. The Redan may be considered the most simple form of *defensive* work, though a straight parapet terminating by short returns at each flank, in the form either of epaulements or of regular parapets, may occasionally be combined with defensive works. The redan is open in the rear, and the line joining B and C is called the gorge.

The "Lunette" is a redan to which flanks or lateral wings have been added; in form, therefore, it resembles a bastion.

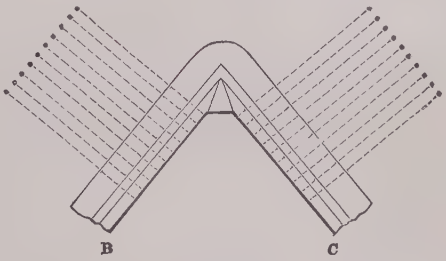


Fig. 51.—Redan.

In fig. 48 Lunettes are shown so arranged that the faces of those in rear may flank the faces of those in front; but with respect to the distribution and arrangement of the works destined to form Lines of Intrenchment more will be said hereafter.

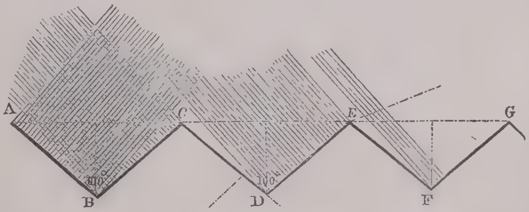


Fig. 52.—Tenailles.

The "Tenaille" is the reverse of the redan; it consists of two lines forming a *re-entering* angle facing the exterior. It can, from its form, only be used in direct or approximate connection with other works, which close up or cover the ends of its lines. Either alone or combined with redans it is very commonly used in continued Lines of Intrenchments. Fig. 44 represents a Line of Redans joined by straight lines, and fig. 45 a Line of Irregular Tenailles, whilst fig. 52 represents a normal Line of Tenailles, of which the re-entering angles do not exceed 100°, and the sides are equal, and fig. 53, an arrangement of Tenailles, with irregular sides, by which a Redan, as DEF, is interposed between every pair of Tenailles. The Line *en crémaillère* (fig. 46) is also derived from a combination of irregular tenailles, and is in many circumstances a very satisfactory arrangement. In selecting between these and other arrangements, including the bastion trace (fig. 47), the engineer must be guided by the nature of the ground and the special objects to be attained. A slight consideration is sufficent to show that the combination of regular tenailles in fig. 52 is only applicable to ground in itself regular. In most cases, however, the ground will be more or less irregular, and the works to defend it must be so also. When it is necessary to approach close to the bank of a river or a ravine, the Crémaillère Line (fig. 49) is the simplest and best, the short or flanking sides being so placed as to face the probable direction of approach, and next to that the combined Redan and Tenaille. Of open works, Lunettes admit of the most scientific arrangement, as they can be so placed in lines with intervals as reciprocally to flank each other, and thus to form a line of defence very similar to a regular bastioned line. The employment, however, of works open at the gorge must be restricted to positions where the enemy can only approach in front, his approach in other directions having been rendered impossible by obstacles or by other works. In every case it is desirable to take advantage of peculiarities in the features of the country, and to modify them into such obstacles as shall relieve the defenders from apprehension of danger, and leave them at liberty to direct their attention more exclusively to the weaker points of their position; but in no case should even apparently inaccessible points be left unwatched, as an enterprising and skilful adversary will at times surmount difficulties which had appeared insurmountable. As naturally defended points in a position can only be looked upon as exceptional advantages, it is evident that works left open at their gorges would be liable to surprise, and would therefore prove but imperfect instruments of defence. On this account it has been not unfrequently prescribed that such works should be left unclosed when within range of musketry fire from the defences behind them; but it is better to lay down the fixed principle that in all cases they should be closed at the gorge, as the power of driving an enemy out of the interior of such a work is of little value, for his object would be not to remain in its *interior*, but to turn its parapet to his own uses. The manner in which they are generally closed is shown in fig. 54, which is a lunette secured at its gorge by a loop-holed stockade, an obstacle effective against an enemy, and, at the same time, easy of destruction, should he succeed in temporarily obtaining possession of the work. Any of the obstacles previously described, such as abattis, etc., may be used for the same purpose, but they have the disadvantage of not covering the defenders of the work from the enemy's fire. An engineer in deciding between open works, such as have been described, and closed works such as will now be described, ought to take into consideration the circumstances of ground not only as affecting the security of the work itself, but as affecting the ease or difficulty with which support can at any moment be afforded to its garrison. Open works are not fitted for any position where they are likely to be left to their own resources, even for a short time, as small bodies of men cannot be expected to stand firm against a vigorous attack from a superior force, unless satisfied that support is at hand. Closed works, therefore, in which the parapet is continuous on all sides can alone be relied upon under such circumstances; and the nature of the obstructions adopted in their construction should be such as to afford the garrison a reasonable confidence that by a vigorous defence they may be able to hold the enemy at bay; for no general should expect to find in soldiers, as a body, that heroism which leads to self-sacrifice without hope. The easy capture of the redoubts at Balaclava garrisoned by the Turks is an illustration of this principle; for though it is possible that they might have been longer maintained by French or British soldiers, it would have been unreasonable to expect that their defenders should remain firm until overpowered and cut down by their assailants, which must have been the result had not a supporting force been at hand to relieve them. The rules may therefore be laid down, that in all detached works the mode and time of relief should be palpable to the garrison; that the nature of the constructions should inspire the garrison with confidence in its power of resistance for a reasonable time; and, above all, that the garrisons of such works should be composed of the best soldiers.

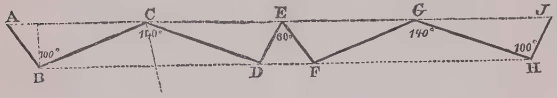


Fig. 53.—Combined Tenailles and Redans.

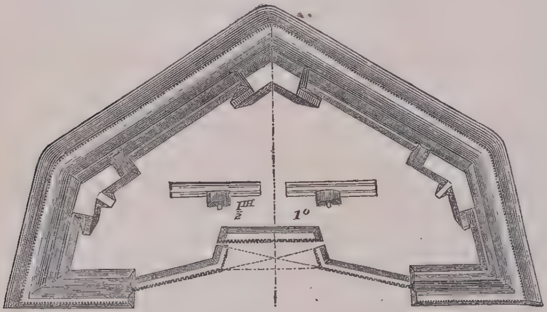


Fig. 54.—Lunette closed at the Gorge.

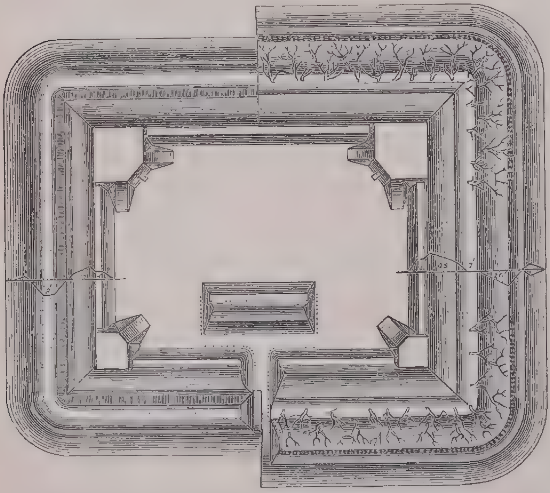


Fig. 55.—Rectangular Redoubt.

Redoubts, as has been said, may be either regular or irregular polygons of any number of sides, but the square redoubt is the most simple (see fig. 40). All redoubts have the disadvantage of "dead" salient angles; and it is usual, therefore, to place the guns used in their defence in the salients, so that their fire may be along the capitals or lines bisecting the salient angles, as well as upon the dead space in front of them. The sides should be made to front the probable line of approach, and, as shown in one half of fig. 55, which represents a Rectangular Redoubt, the escarp is sometimes sloped gently down to the bottom of the ditch, and covered with abattis or other obstacles, which can then be seen and defended in front by direct fire. It is indeed impossible to repeat too often that in all works the efficiency of defence must mainly depend on the power of arresting the progress of the assailants at those points which are under the fire of the defenders. The entrance to a redoubt should be made in the least exposed side, and be protected by a parapeted traverse placed behind it, as in fig. 55, where an arrangement of palisades is shown by which the traverse may be connected with the parapet of the works, and the entrance closed by gates or barriers. Traverses may be also constructed either for the purpose of defilade or for affording additional cover to the troops. They may be formed, when the work is sufficiently capacious, of long parallel epaulements, with a space between them, which can be covered over or blinded when it is likely that the work will be held for a considerable time, and when, in consequence, a more secure and comfortable lodging is desirable for the garrison. Magazines for ammunition may be constructed either against or in such traverses; and fig. 56 represents, in plan and section, a magazine behind a gabion traverse, and isolated from the parapet in front of it. This magazine is partly sunk in the ground, with sides of plank and a roof of strong timbers forming a ridge in the centre, covered first with fascines and then with 4 or 5 feet of earth. Its dimensions are—length, 8 feet, breadth 5 feet, height 6 feet.

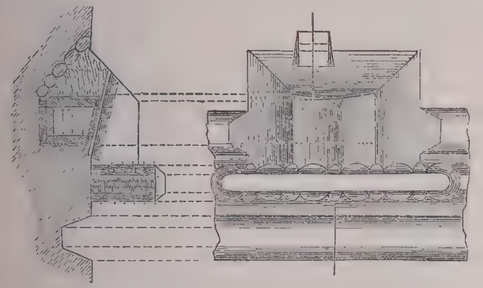


Fig. 56.—Plan and Section of Magazine behind a Gabion Traverse.

Having thus generally described this portion of the subject, it is necessary to determine the least size which can be given to redoubts, so as to ensure interior space sufficient to accommodate the garrison required for the defence of the parapet, remembering that in works not provided with flanking defences the whole parapet, unless secured in part by some insurmountable *natural* obstacle, must be defended.

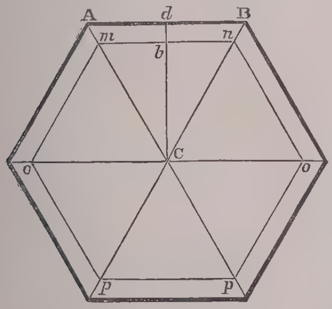


Fig. 57.

A general formula may be easily obtained for determining the least regular polygonal trace in the following manner:—

Let x be the side in feet of any regular polygon, n the number of sides, A the interior surface reckoned from the foot of the banquette, y the number of men forming the garrison, f the number of linear feet allotted to each soldier, F the number of square feet occupied by each man in the interior—then

$$fy = nx, \text{ and } \mathrm{F}y = \mathrm{A}, \text{ or } y = \frac{nx}{f} = \frac{\mathrm{A}}{\mathrm{F}}; \text{ whence } \frac{n\mathrm{F}x}{f} = \mathrm{A}.$$

Again, let the perpendicular Cd, from the centre of the polygon (fig. 57) to its side AB, be p, and let the distance db from the side AB to the boundary line of the available interior space mn be d; then $\mathrm{C}b = p - d$; and as $\mathrm{C}d : \mathrm{AB} :: \mathrm{C}b : mn$, $p : x :: p - d : mn$, or $mn = \frac{px - dx}{p} = x - \frac{dx}{p}$. Now, the value of p expressed as a function of x and of the angle of the centre ϕ, which is $= x \, \frac{1}{2} \cot. \frac{1}{2} \phi$, varies with the nature of the polygon; and replacing therefore the variable coefficient $\frac{1}{2} \cot. \frac{1}{2} \phi$ by β, we have $p = \beta x$, and mn, the side of the interior space $mnpo = x - \frac{dx}{p} = x - \frac{dx}{\beta x} = x - \frac{d}{\beta}$, and $\mathrm{C}b = mn \times \frac{1}{2} \cot. \frac{1}{2} \phi = \beta\left(x - \frac{d}{\beta}\right)$. The surface of the interior triangle $\mathrm{C}mn = \frac{1}{2} mn \times \mathrm{C}b$ is thus $= \frac{1}{2} \beta \left(x - \frac{d}{\beta}\right)^2$, and $\mathrm{A} - \frac{n\beta}{2}\left(x - \frac{d}{\beta}\right)^2$; whence also $\frac{n\mathrm{F}x}{f} = \frac{n\beta}{2}\left(x - \frac{d}{\beta}\right)^2$, and thence by reduction $x = \frac{1}{\beta}\left\{d + \frac{\mathrm{F}}{f} + \sqrt{\frac{\mathrm{F}}{f}\left(2d + \frac{\mathrm{F}}{f}\right)}\right\}$. The values of the variable $\beta = \frac{1}{2} \cot. \frac{1}{2} \phi$ are as follows:—

In the	triangle,	0·288
"	square,	0·500
"	pentagon,	0·688
"	hexagon,	0·866

Taking the square, and supposing we have $d = 12$ feet, $f = 3$, $\mathrm{F} = 6 \times 3 = 18$, $x = 62·81$ feet (21 yards), which may therefore be taken as the side of the smallest square redoubt to be defended by one rank only of soldiers, the garrison being 84 men in single rank, and a reserve equal to one-third of the garrison; if $f = 2$, then $x = 76·66$ feet, or nearly 26 yards, the garrison being 156 men. If there are to be two ranks, $f = 1\frac{1}{2}$, and $x = 89·6 = 30$ yards nearly, the garrison being 240 men; and if two ranks, with a reserve equal to one-third of the whole garrison, $f = 1$ and $x = 115$ feet, or about 38 yards, the garrison being 456 men.

Triangular Redoubts are rarely used, as their interior space is small and out of proportion to the length of parapet; thus the smallest triangular redoubt to be defended by two ranks should have a side (x) 54 yards in length, and a garrison of 324 men, the total length of parapet required for this force being 162 yards; whereas a square redoubt of 38 yards side, which has a total length of parapet of only 152 yards, will accommodate a garrison of 456 men, admitting a "two-rank" defence, with a reserve of one-third the whole garrison. Another objection to Triangular Redoubts is the great amount of dead-angle space before the salients. Keeping these figures in recollection, the engineer will readily be able to determine his arrangement of the proposed garrison, and to limit himself to the least amount of work in parapet. If, however, he has to provide, in addition, for guns, for traverses, and for other constructions, he must increase the side of his square, bearing in mind that in the square of 38 yards side the augmentation of 1 yard per side adds only 12 men to the garrison, raising it to 468, whilst it adds 549 square feet to the interior space; so that, as the 12 men require only 216 square feet, there will be an addition of 333 square feet towards the additional provision specified. And if the side be increased to 45 yards, and the garrison to 540 men, there will be a surplus interior space of 2709 square feet, being sufficient for barbettes, for three guns and one howitzer, and for a traverse; this size may therefore be assumed as the best for a normal redoubt. It has been usual to assume that a redoubt should not have more than 180 yards of parapet, but there does not seem to be any reason for this assumption; and it may be said with confidence that a redoubt with double this extent of parapet will be superior to a field fort of the same strength of garrison, even though the fort has the theoretical advantage of reciprocal defence. The ditches of larger redoubts are sometimes, when circumstances admit, defended by Caponnières (fig. 58) placed either at the angles or in the middle of the sides. These caponnières are built of timber and roofed with logs or fascines, covered with earth; occasionally the ditches are defended by counterscarp galleries at the angles, constructed of the same materials as the caponnières, but buried in the counterscarp. Access is obtained by galleries revetted with timber descending from the interior of the work into the caponnière, and beneath the ditch to the counterscarp galleries. In fig. 40, one of the angles is shown with an indented parapet as a means of correcting the defect of a dead salient; but this is difficult of construction, and it will generally be preferable either to cut it off as in another angle of the figure, or to round it as in a third, or to occupy it by a gun *en barbette*, as in the fourth. Of Forts, fig. 41 exhibits a Star-Fort of eight points formed upon a square, which is far preferable to one of six points formed upon a triangle, as giving comparatively more available interior space. The defect, however, in this trace is that, though the intermediate angle F is sufficiently open—as it exceeds 60°—the angles A and B are less than 60°. Down to the lowest limit of such forts, in which AB of fig. 41 is taken at 60 yards, and the sides AE, EF, EB at 20 yards, there is still sufficient space to accommodate the necessary garrison, which should be in that case about 900 men. It is useless to describe those forms of star-forts which would not accommodate the required garrisons; but that represented in fig. 59 is well fitted for a large garrison. The following is a simple construction on a pentagon. Bisect AB in C; make the perpendicular CP $= \frac{1}{5}$ AB; join AP and BP; make B*d* and A*d* each $\frac{5}{12}$ of AB, and join *dc*, *dc*. In this case the angles at A and B will be 64°, and the short sides (with an exterior side of 120 yards) each 23 yards. From what has been already aid, Demi-bastioned Forts (fig. 43) will rarely be used; but when the proposed garrison requires a large amount of accommodation, and there is time to undertake such works, the bastioned trace should be adopted, as it introduces a principle not observed in the preceding traces, namely, that of defending the whole by a part, the opposite flanks EG, FG (fig. 42) of the two bastions GEAEG, GFBFG defending the intervening curtain GG between them, as well as the faces AE, BF of the bastions—whilst the fire of one flank necessarily sees the escarp of the opposite one and defends it. The bastions are indeed, like their analogous lunettes, works in themselves, the curtain being only a connecting line, forming several bastions into one connected whole. Fig. 42 is a square bastioned fort, but the pentagon is a better form, and should be adopted when practicable. The bastioned form of field forts has been derived from the more massive structures adopted in the permanent defences of fortresses, and its history, so interesting in itself, will be given in a future page. Little further need be said on this section of the subject, except to point out the great importance of field-works in securing a base of operations for an advancing army. Fig. 49 (page 384) exhibits, for example, a bridge head consisting of a bastioned front, with either simple straight branches or branches with a short flank, as shown in the figure (see also fig. 60). This is technically called a Horn Work; and if there had been two such fronts so placed as to throw a bastion in the centre, and connected as before with the river by straight branches, the work would have been called a Crown Work. Lunettes and even Redans may also be used, as in left side of fig. 36, for a similar purpose, where the object is first to secure the bridge from the enemy's attack and fire, and secondly to allow the defending army to manœuvre on the opposite side; but in proportion to the numbers to be passed over the bridge, and to the extent of advance contemplated, it will be necessary either to increase the importance of the works forming the bridge head, or to form more than one bridge in connection with them. Nothing can be more fatal to a retreating army than to be driven back upon a river without a line of intrenchment sufficient to enable it to maintain its ground whilst its arrangements for passing the river are in progress. Fig. 60 exhibits one such arrangement, in which the Horn Work front has been much enlarged, and a lunette as a keep introduced within it. The mode in which the troops can move out at the sides, under protection of covering and flanking parapets, is shown, as well as the barbettes for guns, which become necessary in works having so important an object. Fig. 61 represents a line of Tenaille Intrenchments in front of the lunette, and a line of intrenchment on the near side of the river, from part of which the last terminal branches of the tenailles are flanked. In this figure T, T represent traverses, and F, F either chains or lines of pickets placed across the stream,—the object of the first being to secure the bridge from the ricochet fire of the enemy, and of the second to secure it from destruction by burning or explosive bodies launched by the enemy up the stream, to float down upon the bridge. More extended intrenchments might be formed of lines of lunettes with intervening intrenchments; but it is unnecessary here to pursue the subject further, as the engineer must necessarily adapt his works to the nature of the ground, and to the strength of the army for which he is required to prepare a defensive position, from which it may either advance or retire, without risk or confusion, as the necessities of war may require.

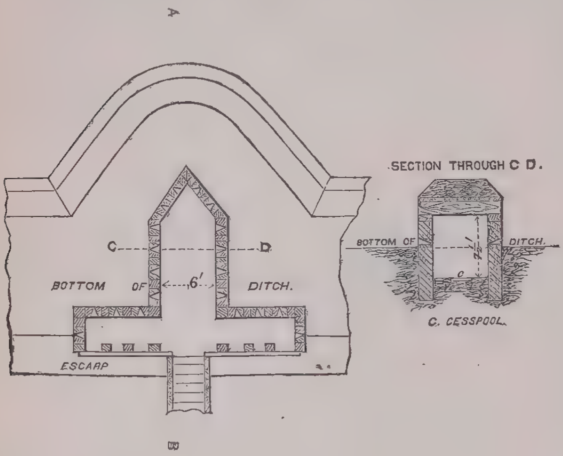


Fig. 58.—Caponnière.

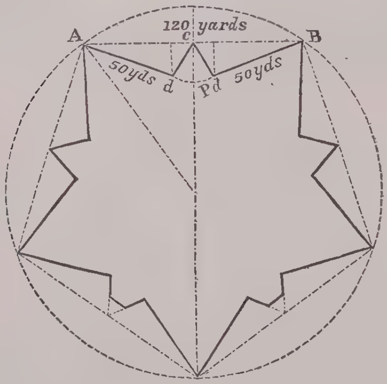


Fig. 59.—Trace of Star-Fort.

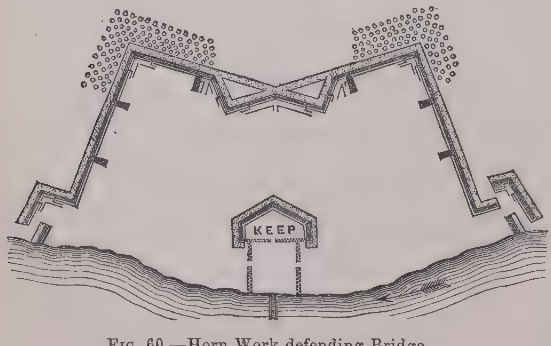


Fig. 60.—Horn Work defending Bridge.

Permanent Fortification.

If, as has been stated, simple lines or works of fortification have been adopted even by the rudest tribes of wandering savages for their temporary defence or security, the more massive and artistic works of permanent defence would seem to imply a certain amount of civilization. As an art, indeed, Fortification is almost co-existent with society. When men first assembled together for mutual protection, and placed their habitations in one spot, the law of necessity, springing in this case from the principle of self-defence, rendered it indispensable for them to adopt means for securing their families and their property against the sudden inroads of enemies. In the early ages men were sufficiently protected by a wall, from behind which they could with safety discharge darts, arrows, and other missiles against an assailant. But when, in the progress of improvement, new and more powerful means of attack were discovered, it became necessary to increase in a corresponding degree the power of resistance; and so it came to pass that the feeble defensive structures of primitive times were superseded by solid ramparts, flanked and commanded by elevated towers; and, as the power of attacking fortresses or places of strength became augmented by successive devices and inventions, so the means of resistance became proportionally increased, until the art of Fortification arrived at a state of comparative perfection, in which for many ages it remained nearly stationary.

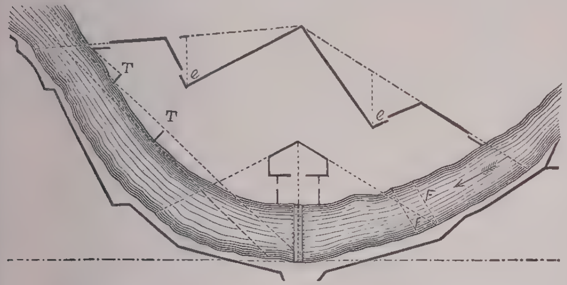


FIG. 61.—Tenaille Intrenchments protecting Bridge.

The various improvements which were from time to time made in strengthening the walls and in adding to the defences of ancient cities, are recorded in history, and need not be detailed in this place. The first walls of which we read were of brick. Amongst the ancient Greeks, brick and rubble stones intermixed were used, as we find from the description of the wall which connected Mount Hymettus with the city of Athens; but surrounding several cities were works of Cyclopean character, built of huge stones, without mortar, placed with their longer axis transversely to the line of wall, and arranged with great care and skill. The walls of Babylon and Nineveh indicate a prodigious advancement in the art of Fortification, and are justly accounted amongst the wonders of the ancient world. Those of the former city, ascribed by some to Belus, and by others to Semiramis, were thirty-two feet in thickness, and one hundred feet in height, surmounted at intervals by towers ten feet higher, and cemented by means of bitumen or asphaltum; they encompassed a vast area, and presented a solid defence, which no means of attack known in ancient times were sufficient to overcome or beat down. The walls of Jerusalem, though of smaller dimensions, appear to have been little inferior in strength and solidity to those of Babylon; for, in the siege of that capital by Vespasian, all the Roman battering-rams and other engines, though used with the utmost vigor through a whole night, only succeeded in disengaging four stones in the masonry of the tower of Antonia. But after Fortification had arrived at the state in which we find it in the works of these and other cities, it remained stationary for ages, and perhaps even retrograded somewhat, until the discovery of gunpowder, the invention of artillery, and the application of both to military purposes, effected an entire revolution in the principles of attack and defence. Then the towers, which had formed secure flanking defences against assailants armed only with arrows and darts, no longer afforded protection against projectiles discharged from cannon; and even those battlements which had defied the catapult and the battering-ram speedily fell before the new force with which they were assailed, burying their defenders in their ruins.

The ancient system of Fortification being thus found of little avail against the new method of attack which came into general use towards the close of the fifteenth century, it became indispensably necessary to adopt improved methods of defence. The plan of fortifying with bastions is believed to have originated with the Italians early in the fifteenth century; though Papacino D'Antoni, professor of artillery and engineering of Turin, states, in *Architettura Militare* (1759), that several small bastions had been constructed in the preceding century, and that the ruin of a large bastion which had formed part of the fortifications of Turin, built for Duke Louis of Savoy, still existed in the royal gardens at that time. The bastions on the enceinte of Verona, built by the Italian engineer Micheli, in the year 1523, are generally supposed to be the oldest extant; and the next, probably, are those of the citadel of Antwerp, which were constructed for the emperor Charles V. in 1545, by the Italian engineer Paciotto D'Urbino. These bastions are small, with narrow gorges and short flanks and faces, and are placed at great distances from one another, it being the invariable practice, at the time when they were built, and for a considerable time afterwards, to attack the curtains, and not the faces of the bastions.

Errard of Bois-le-duc was the first in France who laid down rules respecting the best method of fortifying a place, so as to cover its flank. He was one of the principal officers of the engineers in ordinary to the king, a corps formed by Sully, who was grand master or master general of artillery in the reign of Henry IV., out of the best instructed and most experienced military men. This corps is now the Corps de Génie, and to this day maintains its scientific character. At the command of the minister, Errard wrote a book on the subject, which was published in 1594, and in which the details of his method are explained. As a writer on Fortification, he was preceded in France by Beril de la Treille, who published his work on fortifying towns and castles in 1557. Errard fortified inwards; and in the square, pentagon, hexagon, heptagon, and octagon he made the flank perpendicular to the face of the bastion; but in the enneagon, and in polygons of a greater number of sides, he made it perpendicular to the curtain. In his method, however, the gorges are too small, the embrasures are too oblique, and the ditch is almost defenceless. This engineer constructed part of the enceinte of the citadel of Doutens, the citadel of Amiens, and some works at Montreuil and Calais.

Antoine de Ville, who succeeded Errard, published a treatise, dated 1629, in which he completed much that his predecessor had only sketched, and rectified various defects in the method of the latter. He was employed under Louis XIII., and constructed new enceintes for Montreuil and Calais. His method of fortifying has been denominated by some the French Method, and by others the Compound System (*Système à trait composé*), because it united the Italian and Spanish methods, from the latter of which it differs only in having no second flanks and fichant lines of defence, and in not confining the flanked or salient angle of the bastion to ninety degrees. The leading maxims of De Ville were to place the flanks perpendicularly to the curtain, to make them equal to the demigorges, or a sixth part of the side of the interior polygon, and, in the hexagon and all higher polygons, to confine the flanked angle to ninety degrees. But this method is liable to nearly the same objections as that of Errard, as the embrasures are too oblique, especially in the polygons, and the ditch is ill defended.

In 1645, sixteen years after the publication of De Ville's, appeared the treatise of the Comte de Pagan, which contained the development of a system that, in a short time, entirely superseded those of his predecessors. It was the Comte de Pagan who first disengaged the science of Fortification from a number of suppositions which custom had consecrated, and which, resting more on abstract mathematical reasoning than on practical experience, had hitherto retarded the progress of the art. This engineer served at twenty-five sieges with great reputation; but having become blind at the age of thirty-eight, he was obliged to retire from the service, in which he had already obtained the rank (then second only to that of marshal of France) of mareschal-de-camp, and he died six years after completing the treatise above mentioned. He had from his earliest years devoted himself to the study of mathematics and fortifications, and he published several works on astronomy besides his celebrated work on Fortification. Pagan made the flank perpendicular to the line of defence, in order as much as possible to cover the face of the opposite bastion; and he devised a method of building casemates peculiar to himself. Vauban borrowed from Pagan the length of his perpendicular, and Allain Manesson Mallet, whose construction has found much favor, proceeded upon the principles Pagan had laid down.[1]

[1] Mallet constructed outwards, making in every figure or polygon the demigorge equal to a fifth part of the side of the interior polygon

The Mareschal de Vauban was born in 1633; and at the time of the Comte de Pagan's death, he had already acquired reputation at several sieges. Vauban followed up the principles suggested by Pagan, and employed them extensively, with consummate skill and judgment. He constructed 33 new fortresses, repaired and improved 100, and conducted about 50 sieges. His extensive works, especially the treatise *De l'Attaque et da lu Défense des Places*, published in 1737, speak for themselves. From these works have been compiled the systems which, in the military schools, are denominated Vauban's first, second, and third systems of Fortification, and which the reader will find developed in the sequel. Had the genius of Vauban been applied to the discovery of a method for securing a permanent superiority to the defence of fortified places, posterity would have been greatly indebted to him, and even humanity would have had cause to rejoice in such a triumph of military art. But, being engaged in the service of the most ambitious monarch of modern times, Louis XIV., he applied his great talents to forward his master's views, and perfected that irresistible system of attack[1] which has ever since been so successfully followed. Before his time the superiority was on the side of the defence; but he so completely reversed the case that the success of an attack, conducted scientifically and with adequate means, has been until the present time a matter of certainty.[2] Vauban was no ordinary man in any sense. As the inventor of parallels in sieges, and of ricochet fire, he stands in the first rank of military engineers; and as he conducted 53 sieges, and took part in 140 battles and skirmishes, it must be admitted that in respect of experience he stands in no inferior position. At fifty-five years of age he attained the highest honor of the French army, being created marshal of France; yet amidst his stirring and successful military life he never ceased to turn to account the geometrical knowledge for which he was distinguished when a youth, and which had obtained for him the early notice of the Prince de Condé. His mind was never idle, and was constantly directed to projects of public utility, civil as well as military; and he left behind him records of such labors in 12 folio manuscript volumes, entitled *Mes Oisivetés*, a wonderful monument of his ability and industry.

M. Minno, Baron de Coehorn, first a general of artillery, then a lieutenant-general of infantry, and ultimately director-general of all the fortified places belonging to the United Provinces of Holland, was the contemporary and rival of Vauban. This able engineer, convinced that, however expensively the rampart of a town may be constructed, it cannot long resist the shock of heavy ordnance, invented three different systems by which such obstacles are thrown in the way of a besieging force that, although the place be not thereby rendered impregnable, it can only be reached with great difficulty and hazard. But these systems, without modification, are only applicable to low and swampy situations, such as are to be found in Holland, and are therefore not available in localities of a different description. Nevertheless, Bergen-op-Zoom, Mannheim and other places fortified by this engineer, particularly the two named, have very great merit, inasmuch as it is impossible for a besieger to penetrate into any of the works without being exposed, on all sides, to the fire of the besieged, who are under cover, and from whose artillery and musketry fire it is scarcely possible for an assailant to shelter himself. In fact, Coehorn was a great master, and combined with the bastioned trace, as will be explained when his system is noticed, many of the means of defence springing from another source. He published his first work on Fortification before he had acquired much experience; and in fortifying Bergen-op-Zoom, which is allowed to be his masterpiece, he did not reproduce, except in fragmentary details, any of his published systems.

Since Vauban's time several improvements have been suggested, particularly by Cormontaigne, who entered the corps of French engineers in 1716, nine years after Vauban's death, and died a mareschal-de-camp in 1750. Some account of the system of Cormontaigne will be found in a subsequent part of this article. The three methods enunciated by Belidor are all applicable to an octagon of 200 toises. Scheiter distinguished his systems as great, mean, and little, in imitation of Pagan, requiring the exterior sides of the polygon to be 200, 180, and 160 toises respectively. He adopted from Castriotto detached bastions, and made use of a continuous fausse-braye. Fritach, a Pole, proposed two methods, which he exemplified on different polygons. Dogen, a Dutchman, after enumerating, in a large volume on Fortification, various modes employed by different writers for determining the salient angle, selected three as most worthy of approval, and proposed as many methods of construction, one of which is borrowed from Fritach, the Pole. Pietro Sardi, an Italian, suggested a peculiar method of construction on a hexagon. The Sieur de Fontaine found the flanked or salient angle of the bastion by adding 15° to half the angle of the figure, from the square up to the dodecagon, in which last it becomes 90°, and at this he continued it in all the higher polygons. He also constructed outwards, and, in every regular figure, made the curtain equal to 72 toises, the face of the bastion to 48, and the flank, which he placed perpendicularly to the curtain, to 18 toises, or a fourth part of the curtain. Ozanam and Müller delivered each four methods of construction, the particulars of which will be found in their respective works. In 1751 Charles Bisset, who, as engineer-extraordinary, served with the duke of Cumberland in the Netherlands, and was present during the siege of Bergen-op-Zoom by Marshal Lowendahl, published a treatise on the theory and construction of Fortification, in which there are many sensible and judicious remarks; and this may also be said of an *Essai sur la Fortification, ou Examen des Causes de la grande supériorité de l'Attique sur la Defense*, published anonymously in 1755. In a work entitled *Science de la Guerre*, which appeared at Turin in 1747, a new method of construction is proposed, in which the principal novelties are mines under all the works, and regular communications with them by means of subterraneous galleries, to be resorted to as the enemy approaches the body of the place. The third volume of the *Œuvres Militaires* contains useful observatious and maxims relative to irregular Fortification; and in the supplement to the *Rêveries* of Marshal Saxe, by Baron d'Espagnac, the subject of Fortification is amply discussed, and an accurate description given of the different means of attack and defence. Besides the writers above enumerated may be mentioned the Chevalier St. Julien, an able engineer, who published a method by which, he asserts, works may be constructed at less expense, yet in such a manner as to render the defence more formidable; Francisco Marchi, of Bologna, who in 1599 furnished no less than 139 different methods of constructing fortifications, many of which are valuable, and from which subsequent engineers have greatly profited; Bombelle, who established three kinds of Fortification, called the grand royal (*grand royal*), the mean royal (*moyen royal*), and the little royal (*petit royal*); Blondel, who published a system divided into two principal heads, the great and the little, whose exterior sides are respectively 200 and 170 toises; Donato Rosetti, a canon of Leghorn, who wrote on the method of constructing works in what he calls *Fortification à rebours*, or Fortification in reverse, so denominated because the re-entering angle of the counterscarp being opposite to the flanked angle, it will, according to him, be necessary to attack it from the reverse side of the other works; and Antonio de Herbart, major of artillery in the duke of Würtemberg's service, who published a treatise on Fortifications with what he calls *angular polygons.* The treatise entitled *Nouvelle Manière de fortifier les Places, tirée des méthodes du Chevalier de Ville, du Comte de Pagan, et de M. Vauban, avec des Remarques sur l'ordre renforcé, sur les desseins du Capitaine Marchi, et sur ceux de M. Blondel*, which appeared in 1689, is full of strong reasoning, whence the author deduced a new system; but it contains little that is original, though it gives numerous references to what had previously appeared, and disposes the different parts in a judicious manner. M. de Montalembert's system of casemated and reverse fire has been in part adopted in the splendid fortress of Alessandria, in Italy, which was constructed under the direction of Napoleon.

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or figure, the capital of the bastion equal to a third part of the same side, the curtain equal to three-fifths or thrice the demigorge, and the angle of the flank equal to 98°. The faces of the bastions and the flanks are determined by the lines of defence, which are razant. From these data all the other lines and angles are easily found.

[1] See his work *De l'Attaque et de la Défense des Places*, passim.

[2] The protracted siege of Sebastopol is no exception to this rule. The length of its resistance was due to the fact that the resources at the disposal of the allied armies did not suffice for its investment, and that the Russians were in consequence able to introduce at their pleasure reinforcements of men, material, and provisions; indeed, at times they were more numerous than the attacking force.

Of the more recent treatises on fortification, that of M. de Bousmard, entitled *Essai Général de Fortification, d'Attaque et de Défense des Places, dans lequel ces deux Sciences sont expliquées et mises l'une par l'autre à la portée de tout le monde*, is very elaborate and complete, and enjoys a deservedly high reputation for accuracy and research.

Carnot's *Traité de la Défense des Places Fortes* was written to serve a temporary purpose; and the exaggerated celebrity which it acquired on its first appearance has been succeeded by an equally unfounded neglect. The more prominent innovations recommended in this treatise were —first, an alteration, which, however, was not original, in the trace or outline of the polygon; secondly, the suppression of the exterior revetment of the covered way, known as the counterscarp; thirdly, the detachment of the escarp-wall from the rampart, and the construction of the latter without revêtement; fourthly, destructive personal conflict with the besiegers by means of frequent sorties; and, lastly, vertical fire as the basis rather than the accessory of the defence. With regard to these innovations, all of which the reader will find ably discussed in Jones's *Journals of Sieges in Spain and Portugal*, vol. ii., it may be remarked that by means of an increased expenditure for retrenchments and casemates, as recommended by Carnot, the strength of particular portions of the polygon may be increased; and that, if he has failed in tracing a perfect front, founded on the basis of Montalembert's system of casemated and reverse fire, he has at least rescued a valuable suggestion from unmerited neglect, and rendered an important service to science by directing the attention of military men to means likely to create a barrier against the growing powers of the attack.

The *Traité de Fortification Souterraine, suivi de quatre Mémoires sur les Mines*, by M. Mouzé, lieutenant-colonel of engineers in the French service, published at Paris in 1804, is the most complete work on the subject of which it treats which has yet been given to the public. Subterranean Fortification is a branch of the art which, until recently, was wholly neglected in England, and in which British engineers were far behind their brethren of the Continent. We learn from Colonel Jones's work on the Peninsular sieges that the duke of Wellington's army in Spain was without a trained sapper or miner until late in the year 1813. In this respect things are now changed, and in the Engineers the army has the assistance of a body of men well instructed in the duties of the trench, the sap, and the mine, though it cannot be said even now that the corps of Engineers is of sufficient strength. Nor can this corps, as some contend, be supplemented by civil labor in time of war. Discipline is the foundation upon which the whole military system rests, and the highest skill, unless strictly subordinated to it, will avail little in war. The undisciplined laborer, who, under ordinary circumstances, would have worked with the greatest effort, would be found worse than useless if forced to work on his knees in a sap, exposed to an enemy's fire, or upon his back in a countermine, with the knowledge that the enemy's miner, though he cannot fix his precise position, is probably within striking distance.

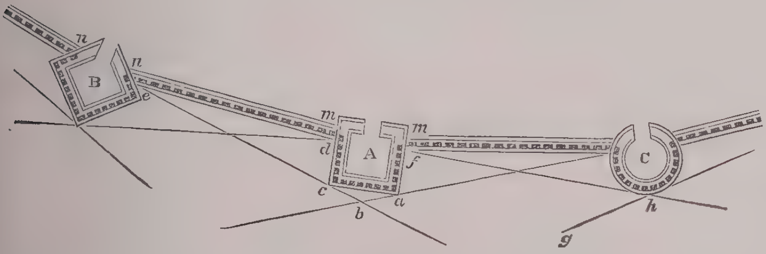


Fig. 62.—Illustrating the Growth of the Bastion.

Before going further it is desirable to recur to the earlier methods, and to investigate the manner in which the ancient arrangement of a wall, with round or square towers, passed into the present systems of defence. Fig. 62 will explain the natural and probable manner in which the old tower or rather tower-fort (*baluardo*) grew into the pentagonal bastion. If, for example, lines of defence be drawn from the extremes of two adjacent curtains to the angles *a* and *c* of the square tower-fort A, a space would be left, *cba*, unseen from the adjacent forts B and C, and therefore undefended, except by downward or vertical fire from machicoulis, or projections from the walls supported by corbels made for the purpose. Such a space would be turned to account by the besiegers in fixing their scaling-ladders; and the change of the straight line *ac* into the two faces *cb*, *ab* seems but the result of a self-evident necessity. As the work became enlarged, the portions of the fort within the connecting walls *m*, *m* were omitted, and the flanks *dc*, *fa* alone remained of the old wall, forming with the faces the bastion *fabcd*, which only required to be improved in proportions to become the bastion of modern times. It is, however, said that the towers were sometimes placed with an angle salient as in B, and if so, omitting the portions *nn*, the resulting bastion has a strong analogy to those of Errard before mentioned. By using the old wall merely as a retaining wall, and as an obstacle against escalade, and adding to it a rampart and a parapet of earth, the Italians completed the system of bastioned defence, which, notwithstanding all the modifications of the French, ought to be called the Italian system. In this system, whilst imitating the construction of the old towers by using casemated or masonry-vaulted chambers for artillery, in addition to the guns mounted on the rampart, the Italians placed the musketeers on the banquette of the parapet, and made them fire over it. Now this arrangement of the musketry fire is an essential characteristic of the Italian system, and the reliefs of the several works are by it restricted within certain limits, as it is necessary so to determine the levels of the opposite flanks that the fire along their superior slopes shall defend the whole of the intervening curtain; but there are other modes of using musketry as well as artillery fire in the defence of the ditches, and on these were founded other systems of Fortification.

The first Italian writer on Fortification was Tartaglia, whose work was published in 1546; but the really first writer on the science was Albrecht Dürer, a great painter, sculptor, and engraver, and a civil and military architect, whose work is dated 1527, being published one year before his death. This remarkable man founded his system on the old circular tower-forts C, fig. 62, with which the dead space is much less than with square tower-forts, and, enlarging the towers to an enormous extent, he adopted the name "Bastei," or in the plural "Basteien," for his new work. As attention was at this early period more directed to cannon than to the rude musket as an instrument of defence, it was natural that the latter should be less considered in these arrangements than the former. Dürer based his systems on the principle that the defences of basteien or other works which depend only on the cannon placed on their terrepleins may be effective whilst the enemy is at a distance, but cannot be so when, under cover of his epaulements, he has reached the ditch; and leaving therefore to the cannon on the terreplein the task of firing upon the enemy's troops and batteries at a distance, he placed cannon and musketry either in vaulted galleries running along the base of the escarp, or in caponnières, also vaulted or casemated works, built across or transversely to the ditch. The great circular bastei of his third and most improved system was no less than 130 yards in diameter, with an escarp 120 feet high, a ditch in front 100 feet wide, and a massive envelope, about 80 feet thick and 100 feet high, formed of earth with thick masonry revêtements both in front and in rear, as a mask between the main work and the counterscarp. Such gigantic proportions as these have led many to consider Dürer as little more than a speculative writer, but this would be an unjust estimate of his real merits. Reducing his works to more reasonable dimensions, they would, with proper modifications, have become practicable, and they have afforded many useful hints to the scientific engineer. The defects of the circular form were compensated by the grazing fire of the caponnières in his system, and the main work was retained in an effective state by the cover afforded to it by the envelope. We shall have occasion to refer again to Dürer, but in the mean time it may be said that whilst the Italians are properly considered the originators of bastioned systems with an earthen parapet over which the musketry fire is directed, Dürer has an undoubted claim to be considered the author of the systems of Fortification in which casemated defence in the main works and in the caponnières becomes the essential characteristic—a system which has proved more fertile in results in modern times than the bastioned system.

Systems of Permanent Fortification,

1. *Vauban's First System.*

Plate. III. Before commencing to draw a plan of Fortification, it is usual to determine the polygon on which to describe it. In Plate III., fig. 1, the angle taken is that of an octagon, and the length of the side is 360 yards. In constructing a fortification, a figure is determined on, as near a regular polygon as possible, within which the enceinte or chain of main works is to be contained. The enceinte or body of the place consists of as many bastions, connected with curtains, as there are sides to the figure, and each of these is made about 400 yards.

The *Principal Line* or *Outline* denotes the line by which the figure of the work is defined. This line is supposed to pass along the cordon of the escarp, and is that from which all the other parts of the work are set off.

The *Exterior Side*, or side of the polygon above mentioned as equal to 360 yards, is that upon which the Front of the Fortification is described, and it extends from the flanked angle of one bastion to the corresponding flanked angle of the next, as AB. These lines are bisected, and a perpendicular CD is drawn from the point of bisection towards the place, its length being proportional to the length of the exterior side and adjacent angle of the polygon,—that is, one-sixth for the hexagon and all figures of a greater number of sides, one-seventh for the pentagon, and one-eighth for the square.

The *Lines of Defence*, AEG, BFH, are drawn from the extremities of the exterior sides through the point D, and produced to an indefinite length; and upon the lines so drawn are set off two-sevenths of the exterior sides, equal to $102\frac{6}{7}$ yards, which mark the points for the shoulders of the bastions, E and F. The distance between these points is then laid along the continuation of each line of defence, viz., from E to G and from F to H, and the line connecting G and H is the curtain GH, from the extremities of which lines are drawn to the points marked off for the shoulders of the bastions, and these form the flanks. In this manner is drawn a Front of Fortification, and this being repeated upon each side of the polygon, completes the works of the enceinte, or body of the place.

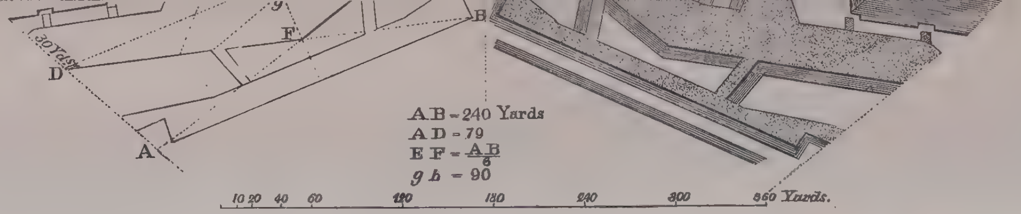
Vauban divided his first system into three classes, namely, the little, the mean or intermediate, and the great. The first he used for small forts of four or five sides, citadels, horn-works, and crown-works, making the exterior side from 120 to 240 yards, the perpendicular equal in the square to one-eighth, and in the pentagon to one-seventh, and the faces of the bastions in each equal to two-sevenths, of the exterior side. In the mean or intermediate, which is adapted for all sizes of towns, the exterior side varies from 250 to 360 yards, the perpendicular is one-sixth, and the faces of the bastions are two-sevenths. In the great the exterior side varies from 360 to 520 yards. This was never adopted for all the sides of a place, but only in the case of one which happened to be near a river or a marsh, when the distances of the bastions should be so regulated that they may not be out of musketry range from one another. When the curtain becomes unavoidably too long, this defect is in part remedied by erecting on it a flat bastion, which is not so high as the rest of the works.

Ground which will admit of being regularly fortified throughout is seldom met with; nevertheless, the rules of regular fortification must be observed as nearly as possible, These are—that the flanked angles should not be less than 60°, that the lines of defence should not exceed musketry range, and that the sides should be lengthened or shortened so as to obtain a well proportioned front upon each. After an irregular place has been reduced to as regular a figure as possible, lines are drawn parallel to the sides of the figure at the distance of about 50 yards from the houses, in order to give sufficient space for the rampart; and these lines form the interior polygon, which may be fortified outwards, by setting off the demigorges of the bastions, and raising their flanks at angles of 100° with the curtain. Or the exterior side may be formed and fortified inwards by drawing a line parallel to each of the interior sides; and when the angle is that of a polygon of more than five sides, the distance from the exterior to the interior sides should not be less than 100 yards. If a side extend from 360 to 520 yards, the perpendicular should be diminished to about 50 yards, and the faces of the bastions be made from 100 to 120 yards. All these dimensions should, however, be now much increased, and placed in relation to the range of the modern rifled small arm.

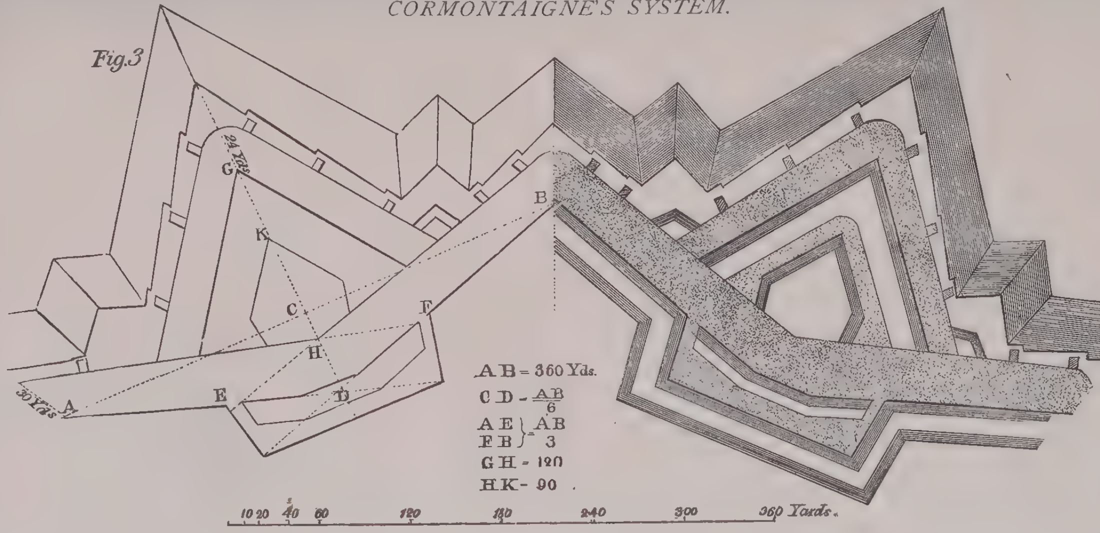
The *Ditch* or *Fosse* is an excavation of from 15 to 30 feet in depth, and from 30 to 50 yards in breadth, surrounding the rampart on the exterior side; the earth dug out of it serves for the rampart and parapet. The side of the ditch next the place is called the *escarp*, the side next the country is called the *counterscarp*, and is made circular opposite the salient angles of the works. In the figure arcs are described with a radius of 30 yards, opposite the salient angles of the bastions, tangents to which are drawn upon the shoulders of the neighboring bastions, and thus the width of the ditch is fixed. The general dimensions of a ditch should be such that its excavation, or deblai, would produce sufficient earth, or remblai, for the formation of the works. The breadth varies from 30 to 50 yards, in order that, in passing across it to the assault, the enemy may, for a considerable time, be exposed to the fire of the works; and its depth must be such as to render difficult the escalade of the parapet, as well as to prevent the besiegers at the crest of the glacis from being able to see the lower part of the revetment of the escarp. The line of the counterscarp is drawn from the rounding at the salient angles of the bastions upon the shoulders of the bastions next adjoining, in order that the whole of the ditch may be defended by the fire of the flanks of the bastions. Ditches are of three kinds,—wet, dry, and such as may be rendered either wet or dry. The wet ditch is effectual against surprises or sudden assaults, excepting during hard frost, for it may be passed when frozen, as in the attempt to surprise Bergen-op-Zoom in the year 1814; but the number of bridges of communication, which require continual repair, and the difficulty of making sorties, render a wet ditch extremely inconvenient. A dry ditch, which is capable of containing works for its own defence, and by means of which communications round the works may more easily be maintained, is therefore preferable; but the third kind, which unites the advantages of the other two, is to be preferred to either. It is only in particular situations, however, that such a ditch is practicable.

The *Tenaille*, in the form given to it by Vauban, does not appear in the works of earlier engineers, but it seems to be naturally derived from the trace of Rimpler (1673), in which the *middle flank* is analogous in function to the tenaille, and occupies its position. It is a work placed in front of the curtain, and is thus formed:—its side faces are upon the lines of defence, and commence at points 11 yards distant from the shoulders of the bastion; its front face is 28 yards from and parallel to the curtain; its gorge is parallel to and 17 yards from the faces; its ends are parallel to the flanks of the bastions. The relief or height of the tenaille is determined by that of the neighboring flanks, and it has a parapet of 7½ feet in height and from 12 to 15 feet in thickness. The use of the tenaille is to cover the postern gate, which is often made in the curtain or flank; in dry ditches it protects the troops formed behind it for the defence of the ditch; in wet ditches it covers the boats collected for the same purpose. It adds materially to the defence, as its fire, from being more horizontal and nearer to the bottom of the ditch, is of course very effective. It fires into the ravelin, and acts as a partial traverse to the escarps of the curtain and the flanks.

The *Ravelin* or *Demilune* was originally designed to cover the entrance to the fortress, but it soon developed into a most important work of defence, appearing as such in some early Italian Traces. Speckle, the great German engineer, who fortified Schlottstadt, Hagenau, Ulm, Colmar, Basel, and Strasburg, was, however, the first who recognized fully its importance, and laid down the rule that "great ravelins materially augment the defensive power of a bastioned system." Constructed upon this principle, the ravelins of Speckle were even larger than the ravelins of Cormontaigne's system, and covered nearly the whole of the bastions, their faces being directed on the salients of the



CORMONTAIGNE'S SYSTEM.



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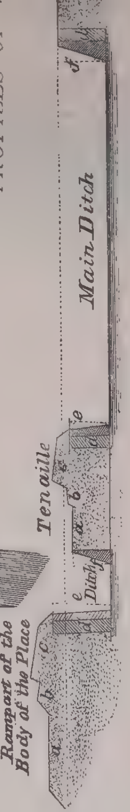
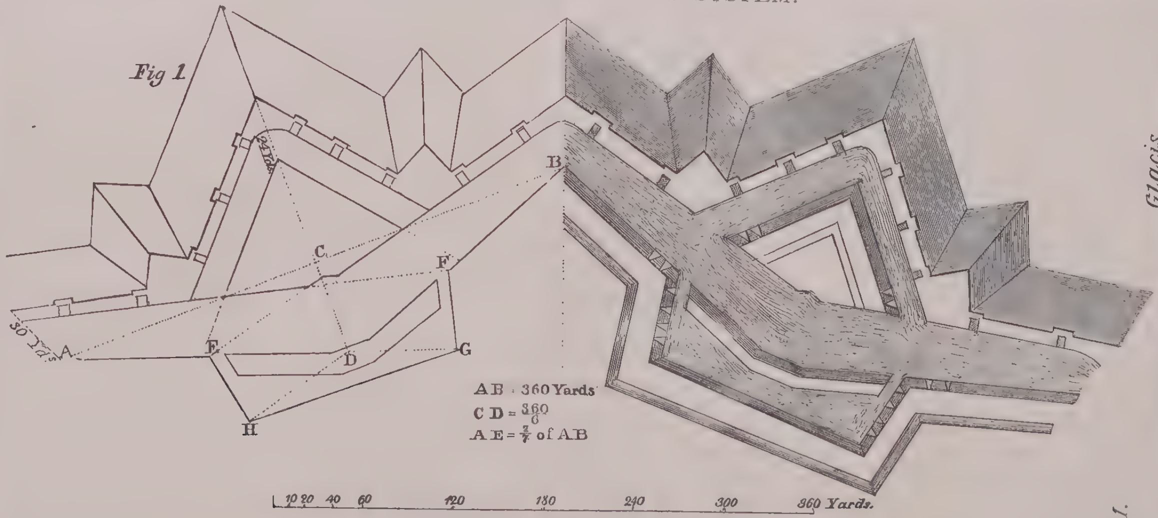


a-Terre plein, b-Banquette, c-Parapet

VAUBAN'S FIRST SYSTEM.

Fig 1.



VAUBAN'S SECOND SYSTEM.

Fig 2.

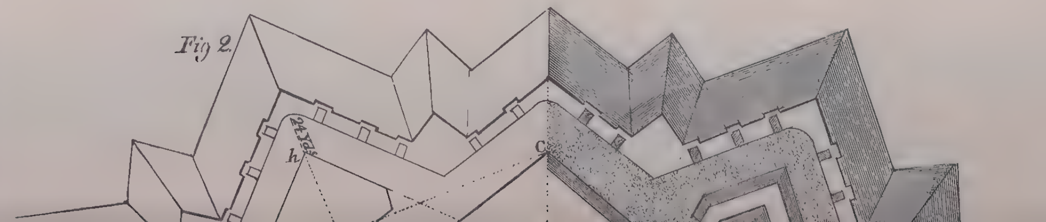
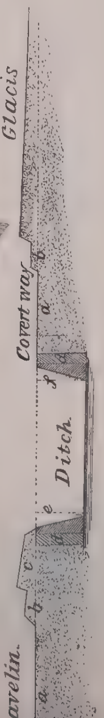


Fig. 4.

BAN'S FIRST SYSTEM.



vêtment, e-Escarp, f-Counterscarp.

bastions and their capitals, extending about 150 yards in advance of the exterior side of the polygon. Speckle was a man of science, having studied mathematics and military engineering in his youth, and perfected his knowledge by visiting and inspecting the most remarkable Italian fortifications existing in his time. The Ravelin is a work constructed opposite the curtain, of two faces meeting in an outward or salient angle, with two demigorges formed by the counterscarp. Its use is to cover the curtain, the gates, and the flanks of the bastion. The Ravelin is constructed as follows. At 11 yards from the shoulder along the faces of the bastion, points are set off; an arc is described from the angle of the flank upon the perpendicular produced, with a radius of 160 yards; from this intersection lines are drawn towards the points set off, but not further than the lines of the counterscarp; at the intersection of the lines of the counterscarp or re-entering angle 6 yards are set off on the capital or line bisecting its angle, whence lines are drawn parallel to the lines of defence till they meet those of the counterscarp. Stairs, called *pas-de-souris*, are constructed here in order to facilitate the entrance into the ravelin from the ditch. The ditch in the ravelin, which is 24 yards in breadth, is made circular at the salient angle, and drawn parallel to the faces till it joins the main ditch.

The *Covered-way* was first described by Tartaglia in 1554, so that it must have been used at a very early epoch of Italian Fortification. Some of the first bastioned fortresses were, however, without this highly important work; and it is recorded that at the siege of Vienna by the Turks, the garrison having made a sortie, some companies were pursued by the Turks up to the counterscarp, and forced over it into the ditch. The necessity of being able to assemble *under cover* from the enemy's fire the troops intended for a sortie, and to afford them when repulsed a place for reforming and checking the enemy's progress, and thus insuring an orderly retreat into the body of the place, soon became apparent, and a Covered-way was supplied to works originally constructed without one. It is a space of 10 yards in breadth, extending all round the work between the edge of the counterscarp of the ditch and the parapet which covers it; this parapet is from 7 to 9 feet in height, and has a banquette for musketry. The superior part of this parapet forms a gentle slope towards the country, which terminates at the distance of from 40 to 70 yards; and this slope is called the *Glacis*. The Covered-way serves for drawing up troops in order to make sorties, and costs less than any other part of the works in proportion to the difficulty of taking it. In its salient and re-entering angles are open spaces called *Places of arms*.

The *Salient Places of arms* are the open spaces between the circular parts of the counterscarp and the prolongation to intersection of the branches of the covered-way. The *Re-entering Places of arms* are constructed with two faces, forming a salient angle of 100° with the covered-way. The demigorges of the re-entering places of arms are generally from 24 to 30 yards; but when they are intended to contain a redoubt or intrenchment, they are from 40 to 48 yards. The Re-entering Places of arms are meant to flank the branches of the covered-way, and to contain the troops for its defence. The Salient Places of arms also serve for the assembly of troops for the defence of the covered-way.

Traverses are constructed across the covered-way, upon the prolongation of the sides of the ravelins and bastions, perpendicular to the line of the counterscarp; they are from 18 to 20 feet thick, and serve to cover the troops from the enfilading fire of the enemy. Other traverses are constructed between these, so placed that the distances between them should not exceed 40 yards. Passages 10 or 12 feet wide, which are formed by cutting into the parapet of the covered-way round the ends of the traverses, afford thorough communication; the openings are closed when necessary by gates. In the more improved systems of Cormontaigne and others, these openings are constructed in such a manner that each can be defended by the fire from the traverse in rear of it.

The *Glacis*, as already stated, forms a gentle slope from the parapet of the covered-way towards the country, and varies from 40 to 70 yards in length. Its parapet cannot be ruined by the fire of the enemy; it covers the revetment of the body of the place; and being an inclined plane, it can be easily seen and defended from any part of the works.

The *Rampart* is an embankment of earth, and is the part of the works next to the town which it surrounds. It must be broad enough to carry the parapet and to provide sufficient space behind it for working the guns, and for the free passage of the defenders. The *Ditch* is immediately in front of the rampart, which is sustained by a revetment-wall of masonry or brickwork, called the escarp, strengthened by interior buttresses, called counterforts, placed at intervals regulated by the height of the wall and their own thickness. The Rampart is divided into the *terreplein*, the *banquette*, the *parapet*, and the *escarp*. See Plate III., fig. 4.

The *Revetment* or face of masonry around the work on both sides of the ditch is intended to prevent the earth above from falling into the ditch. To ascertain the proper thickness of masonry for revetments has always been a matter of considerable trouble and difficulty. General Sir Charles Pasley of the Royal Engineers has given the following rules. (1) For full-scarped revetments without berms, and for demi-revetments having berms equal to one-fourth the height of the masonry, the thickness of the wall should be seventeen-sixtieths, and the length of the counterforts or buttresses one-fifth of their height. (2) For demi-revetments without berms, the mean thickness of the wall should be three-tenths, and the length of the counterfort one-fifth of the height. (3) For counterscarp revetments, having only to retain simple terrepleins, the mean thickness should be one-fourth, and the counterfort one-sixth of the height. In all these cases General Pasley supposes the revetment to be countersloped, that is, to have the exterior slope in a vertical plane, and the interior face inclined, so that the base of the wall may be broader than its top by one-fifth of its height; and he also supposes the counterforts to be rectangular, and the intervals between their centres to be equal to four times their width. (4) He recommends that the foundations be made deeper in rear than in front,—that the courses of masonry form an angle with the horizon of about 10° till within a foot from the exterior, where they should be horizontal, to prevent the rain from penetrating,—and that the interior face of the wall should be of irregular form. The lateral pressure of the earth against the revetments may be diminished by building arches in one or two tiers between the counterforts.

The *Cordon* is a round projection of stone, about a foot in diameter, near the top of the revetment wall, which serves to throw the drip of rain off the face of the masonry. It is also a considerable obstacle to besiegers, as it prevents their ladders for escalade being placed against the escarp.

The *profile* or *section* of Vauban's first system is given in Plate III., fig. 4, in order to illustrate the relative relief or height of the respective works, and to show the command which each has over the work in its front. When the height of the rampart, including that of its parapet, is 20 feet, and that of the parapet of the covered-way is 9 feet above the plane of the site, then the rampart will have a command of 20 feet over the country, and 11 feet over the crest of the covered-way; and the latter, again, will have a command of 9 feet over the country. There are three sorts of command, namely, in front, in rear, and in enfilade. That in front is when any eminence which commands the work directly faces it; that in rear when the eminence is behind the work; and that in enfilade when the eminence is on the prolongation of any line or work. The last, which is the most dangerous kind of command, is best remedied by raising the salient of works exposed to it (see fig. 23, p. 377), or by erecting traverses. In fig. 4 of Plate III. a line, called the line of site, and supposed to be the surface of the ground on which the fortification stands, is drawn, and perpendiculars are erected on it equal to the respective heights of the different parts of the works corresponding to the lines in the figure;—*a* showing the terreplein, *b* the banquette or step to enable the soldiers to fire over the parapet, *c* the parapet, *d* the revetment, *e* the escarp, *f* the counterscarp, and so on.

2. *Vauban's Second and Third Systems.*

The principles of Vauban's First System having been thus explained, no great difficulty will be experienced in understanding the methods of other engineers who have constructed works varying but little in essentials from this system, the variations having arisen from difference of situation and local peculiarities rather than from other causes. In his other methods of construction, as, for example, in his second and third systems, Vauban himself merely modified, according to circumstances, the principles upon which his first is based. When this celebrated military engineer was called upon to repair or improve the fortresses of Landau, Breisach, etc., and found these places surrounded with strong walls strengthened by small towers at the angles, he did not destroy these defences, but constructed, nearly in the same proportions as in his first system, large counterguards or bastions in front of the towers which crowned the angles of the wall, just as the Italian Castriotto had done in 1584. And by this method an important object was attained; for, as in front of each tower, or rather tower-bastion, there ran a ditch which cut off all communication between it and the counterguard, so the enemy, even if they should have succeeded in establishing themselves in the counterguard, would still have another ditch to cross, and another wall to breach, before they could attempt to give the assault.

There is so little difference between the second and third systems of Vauban that a description of the former will enable the reader to appreciate the peculiarities of the latter. In the second system (Plate III., fig. 2), the interior side of the polygon, from the centre of one tower-bastion to that of the next, is supposed to be 240 yards, and at 24 yards from its extremities perpendiculars are erected equal to 36 yards for the flanks of the tower-bastions. A line is then drawn through the extremities of these perpendiculars, parallel to the interior side AB, till it meets the oblique radius of the polygon, or line drawn from the centre of the polygon bisecting its angle, and this being done on both sides of the angle forms the tower-bastion. The oblique radius is produced 78 yards, and lines of defence are drawn to the angle where the tower-bastion joins the curtain or line AB. On these lines of defence, the faces of the counterguard, or exterior bastion, are set off equal to 128 yards, and from the point forming the shoulder, flanks are directed to a point set off on the line AB, at the distance of 70 yards from its extremities. From the salient angles of the tower-bastions arcs are described with a radius of 14 yards for the breadth of the ditch, and tangents to these arcs are drawn parallel to the faces of the tower-bastion, but stopped where they would meet a line drawn from the salient angle of the tower-bastions, at the distance of 20 yards from the flanks.

The *tenaille* is the same as in the first system, excepting that at its ends it is carried down till it meets the lines of defence drawn between the flanked or salient angles of the tower-bastions. The *ditch* in front of the counterguards, or, in other words, the main ditch, is constructed in the same manner as in the first system. The *ravelin* is formed by setting off 90 yards from the re-entering angle of the counterscarp, and directing its faces to points set off on the counterguards, at the distance of 20 yards from the shoulders. A flank is formed by cutting off the corners of the ravelin at the distance of 14 yards on its demigorge, and 20 on its face; and this flank serves for the placing of guns in such a manner that their fire may be directed into the counterguard, or into the ditch before them, as occasion may require. Again, at the distance of 48 yards from the re-entering angle of the counterscarp, lines are drawn parallel to the faces of the ravelin for the *redoubt;* a ditch is formed in front of this, and parallel thereto, about 18 feet in breadth; and the redoubt thus constructed has a command of 4 feet over the parapet of the ravelin, as the tower-bastions have over the counterguards. The *covered-way* and *glacis* are formed as in the first system. It sometimes happens that redoubts are constructed in the re-entering places of arms; in which case their demigorges are made from 15 to 40 yards, and their faces set off at an angle of 100°, as before.

3. *Cormontaigne's System.*

The difference between the Systems of Vauban and Cormontaigne may easily be discovered by an examination of Plate III., fig. 3. Vauban makes the faces of his bastions two-sevenths of the exterior side, and Cormontaigne one-third. Vauban, in his first system, directs the faces of his ravelin to points upon the faces of the bastion distant 11 yards from the shoulders, and in his second and third systems, to points distant 20 yards; but Cormontaigne makes the capital of his ravelins about 120 yards, and directs the faces to points distant 30 yards from the shoulders; by which means the flanks are better covered, and the bastions and ravelins are enlarged. And this is an advantage; for he is thus enabled to construct a larger redoubt in his ravelin, the curtain and flank are also better covered, and, as the former is shorter, communications are more easily kept up between the bastions. Cormontaigne gives the same breadth to his covered-way as Vauban, but he arranges in a different manner the communication round the extremities of the traverses, as may be seen by inspecting the plate. By this zig-zag line of communication, which resembles the crémaillère trace adopted by Speckle in his covered-way, the passage round the extremity of one traverse may be defended by the fire of the other in its rear, or nearer to the body of the place, and the advance of assailants along the covered-way checked. As Speckle planned in 1589, or long before the invention of ricochet fire by Vauban had rendered traverses an essential element in fortification, his object was not the same as that of Cormontaigne, but simply to ensure a more perfect flanking defence of the branches of the covered-way than that afforded by the places of arms of his systems. The ditches are, as shown in fig. 3 of Plate III., on different levels—the main ditch being about 23 feet deep, and the ditch of the redoubt of the ravelin only 7 feet, so that from this latter ditch there is a fall of 16 feet to the main ditch, rendering it impossible to attack the ravelin by its gorge without the aid of ladders. An examination of the several figures which represent Vauban's and Cormontaigne's systems, as also the outworks of fig. 3, Plate IV., will at once render evident the vital defect of the ordinary arrangements of outworks—that they expose through the openings of their ditches the escarp of the body of the place, or of the work on which their faces or branches are directed, to be breached. In the System of Cormontaigne, as well as in the Modern System next to be considered, the increased projection of the ravelins, by throwing the intervening bastion into a deeply re-entering position, secures it from attack by approaches until the salients of the ravelins have been taken; but this great advantage is diminished by the power of breaching the bastion from the glacis through the opening afforded by the ravelin ditch. For the purpose of covering the communication to the re-entering place of arms, a *demi-caponnière*, or work composed of a parapet and glacis, was thrown across the ditch of the ravelin, as shown in the figure of the modern system (Plate IV., fig. 2). This work afforded cover also to troops assembling preparatory to a sortie upon the enemy when making the passage of the ditch, but, from the depth of the ravelin ditch, it was insufficient to mask the revetment of the bastion behind it. It will presently be shown how this object was afterwards effected; and it may be said that without any material change in system, Cormontaigne's variations from Vauban's trace are unquestionable improvements.

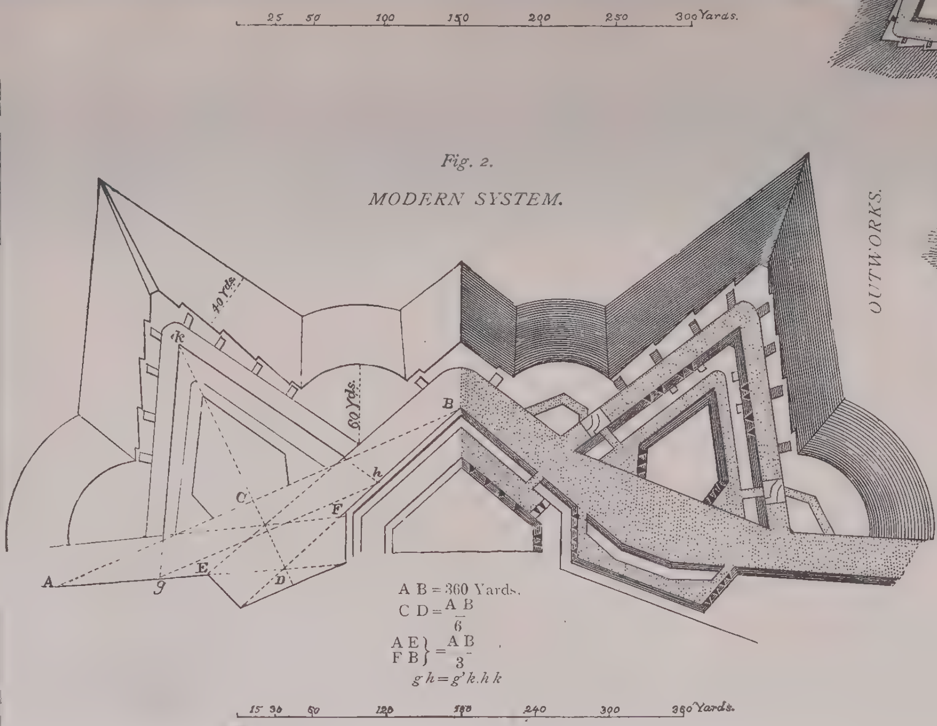
4. *The Modern System.*

Plate IV.

The Modern System, which is shown in Plate IV., fig. 2, varies little from Cormontaigne's. Its perpendicular is one-sixth of the exterior side, and the faces of the bastions are one-third. The flanks are at right angles to the lines of defence, whereas in Vauban's System they form an angle of about 82°,—which is not so good, because, in the Modern System, the guns placed in the flanks can fire straight along the ditch without being moved or turned on their platforms. The ravelin is formed by setting off points 34 yards from the shoulder along the face of each bastion; a line joining these points is the base of an equilateral triangle, the vertex of which, opposite the centre of the curtain, forms the salient angle of the ravelin. The redoubt of the ravelin is formed by drawing its faces parallel to those of the ravelin from the shoulder of the parapet of the bastion; and it has flanks with a ditch about 20 yards in breadth. The *cavalier* in the bastion is drawn parallel to the faces of the bastion, at the distance of 48 yards from them. The ditch of the faces is 10 yards in width, but there is no ditch to the flanks. In bastions strengthened by a cavalier retrenchment, a coupure is formed perpendicularly across the faces of the bastion; the ditch of the coupure is 30 feet wide, and the counterscarp is traced from a point 36 yards from the shoulder of the bastion to meet the counterscarp of the ditch of the cavalier. This system originated in the school of military engineering instituted at Mézières in 1750, and was for some time called the system of the school of Mézières. It has, however, been much improved since; and the system which is now recognized as

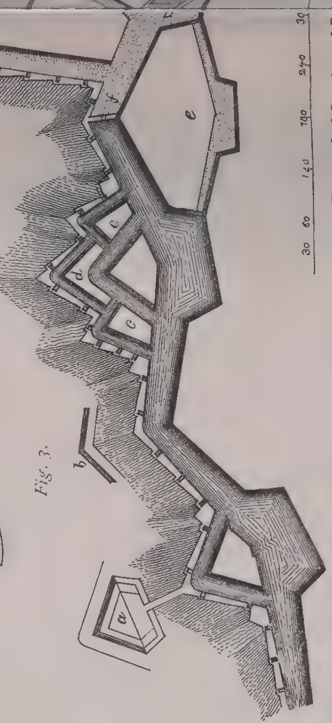
Fig. 2.

MODERN SYSTEM.



OUTWORKS.

Fig. 3.

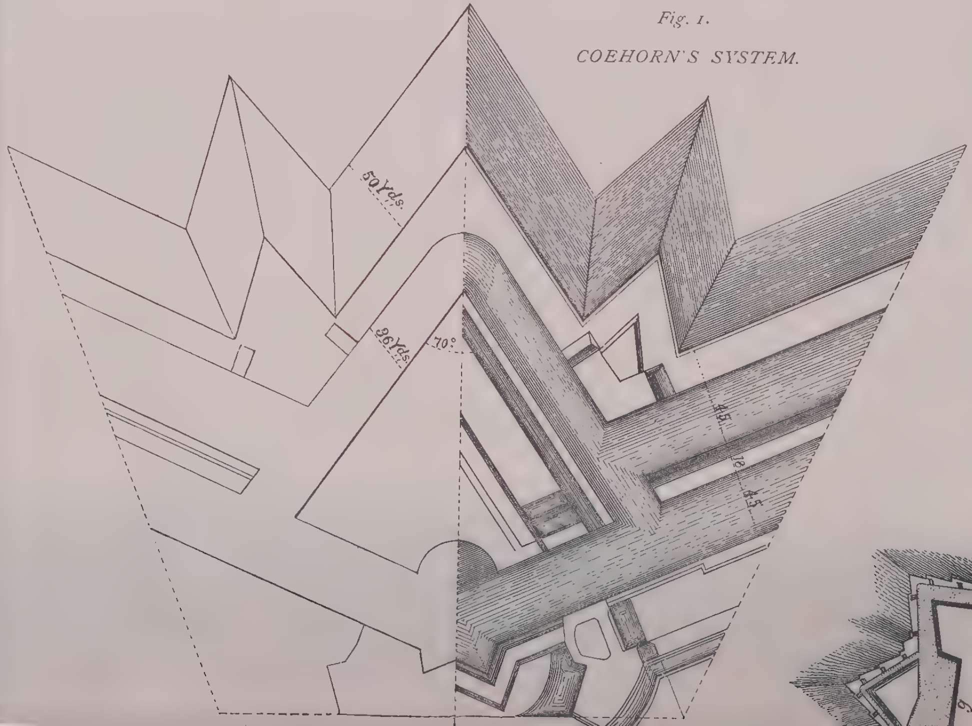


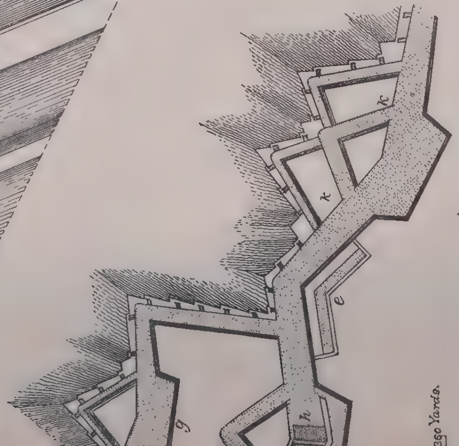
a-Detached Lunette, b-Fleche, c-Lunettes, d-Bonnet, e-Entrenched Bastions, f-Bo

FORTIFICATION.

Fig. 1.

COEHORN'S SYSTEM.





eau, g-Hornwork, h-Caponnière, k-Tenaillon.

the "Modern System" is that of General Noizet. Referring, however, to fig. 2 of Plate IV., it will be seen that coupures have been introduced in the faces of the ravelin; and as the ditch of the ravelin in this system is less by 7 or 8 feet than the main ditch, there is a sufficient fall between the two to check the enemy in his passage to the latter, whilst the demi-caponnière is raised so much higher, and therefore begins to mask more effectually the revetment of the bastion. In General Noizet's system this demi-caponnière is formed into an elevated mask, which tends to secure the revetment from the breaching effect of the fire from the enemy's battery on the crest of the ravelin glacis. This is shown in fig. 63; and the system modified from the former modern system in this respect, as well as in other arrangements, is now the normal bastioned system of the French schools. In General Noizet's arrangement the flanks are not made perpendicular to the lines of defence, but, as in Vauban's first system, form angles of about 80° with them. In the citadel of Ghent, which is a beautiful example of this system, but with still further modifications, the retrenchment of the bastion is so formed as to take advantage of this construction; and the flanks, being casemated and pierced in both directions, become on one side the flanks of the retrenchment, whilst on the other they are the ordinary flanks of the bastion, thus giving a much longer curtain to the retrenchment, which occupies the whole gorge of the bastion, than in the form exhibited in fig. 2 of Plate IV.

5. *Outworks.*

Plate IV., fig. 3, shows several kinds of Outworks, as a horn-work *g*, tenaillons *k* and *k*, a bonnette *d*, lunettes *a* and *d*, an entrenched bastion *e*, a batardeau *f*, and a caponnière *h*. These, and other works of a similar description, are constructed for the purpose of occupying ground which might otherwise be of service to the besiegers, or, as in the caponnière, to cover communications; but their application must of course depend upon localities, and the judgment of the engineer must therefore determine in each particular case which are the best to adopt.

POLYGONAL OR GERMAN SYSTEM.

The Systems of Fortification of which mention has been made were devised to meet the attack of horizontal fire, but henceforward the efforts of the engineer must be directed to devise methods of protection against curved and indirect fire of greatly increased range and power. It is true that the efforts of the later engineers have been in this direction, but the recent introduction of rifled guns and the still more recent development of indirect fire have rendered a recourse to very different measures absolutely necessary.

Before entering upon the consideration of these measures, it may be well to point out that a rigid adherence to the theory of defilade, which is based on the erroneous supposition that the path of projectiles is in a straight line, and, as a consequence, that artillery can only strike that which it sees, has contributed more than anything else to detain the art of defence behind the art of attack; indeed engineers of great weight were wont to maintain that, if the cordon of the escarp were in the plane passing through the crest of the glacis, the escarp was perfectly covered from artillery fire. Cormontaigne and Montalembert have fallen into this error, and so in more recent times have Choumara and later writers upon the Polygonal System.

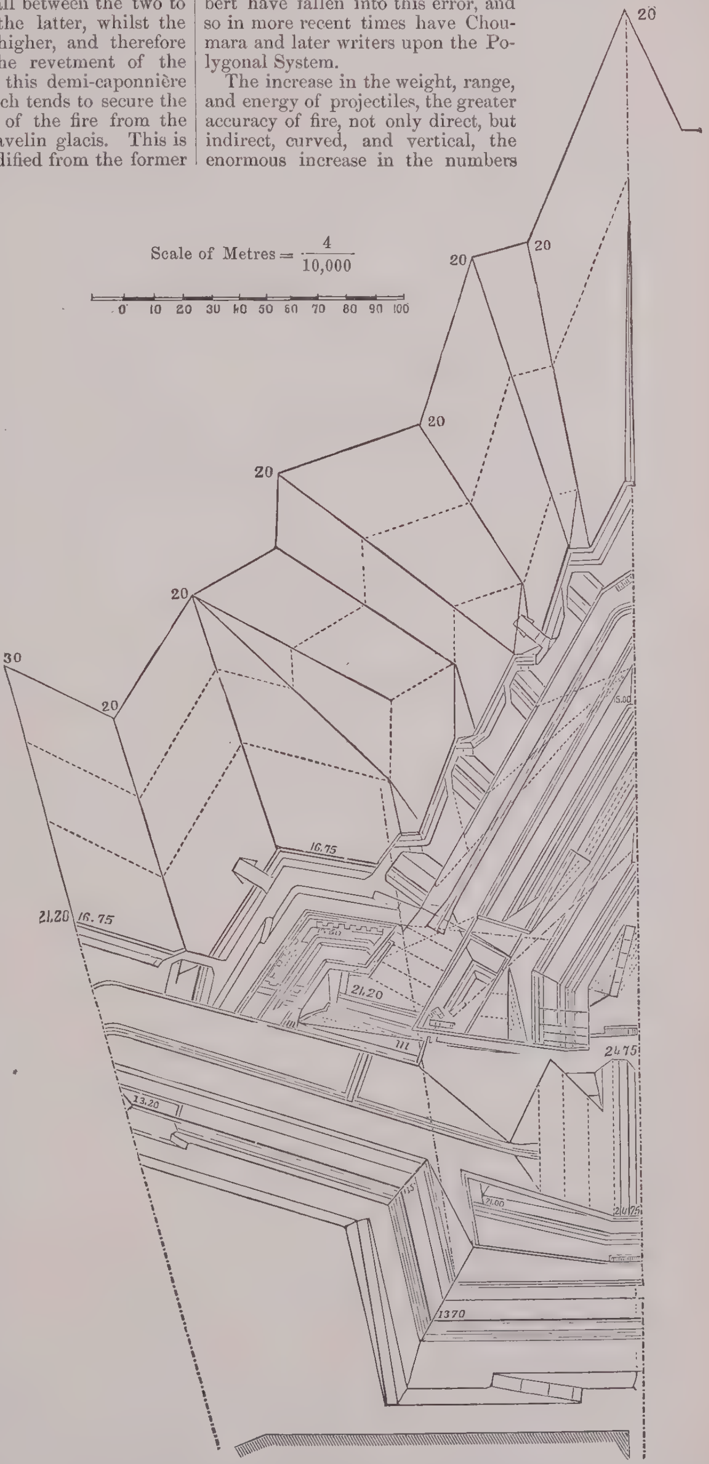


FIG. 63.—Half-Front of the Modern System.

The increase in the weight, range, and energy of projectiles, the greater accuracy of fire, not only direct, but indirect, curved, and vertical, the enormous increase in the numbers of armies, and the wonderful mobility afforded to them by the development of railroads and steam vessels, by the subordination of steam, machinery, telegraphy, and other scientific applications of modern life, to military purposes, have rendered necessary fortresses of an enlarged and of a more expensive nature, and have led to the adoption of a system of defence more simple, and based upon broader principles.

Power of English Siege Artillery.

	Nature.	Penetration at 1000 yards with common shell.										Remarks.
		Earth.		Soft Wood.		Brick in Mortar.		Concrete.		Masonry.		
		ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	
Siege Guns. M. L. R.	64 Prs.	17	0	7	0	8	0*	4	6*	0	11†	The two penetrations marked (*) are with battering shell. With brick in cement the penetration is about one-half that with brick in mortar. † This is in sandstone. There is hardly any penetration into granite, but the blocks split.
	40 Prs.	16	0	6	0	2	0	1	6	0	6	
	25 Prs.	10	0	4	6	1	3	1	0	0	3	

N. B.—The penetration of the siege howitzers is comparatively small. The lowest effective velocities against revetments are considered to be from 450 to 500 feet a second.

The Bastioned Trace designed to afford from uncovered flanks a complete defence to the escarp of the body of the place can accomplish this end no longer, since these flanks can now be destroyed by the fire of distant artillery, and the faces of the bastions themselves can be ricochetted from an equal distance.

Moreover, this trace, in which the relations between the length of the front, the depth of the ditches, and the command of the enceinte are obligatory, is difficult of application, and weak in its direct artillery defence, inasmuch as a portion of the rampart which should be available for the defence is withdrawn for the service of the flanks and curtains.

In the Polygonal Trace,—which requires no inter-relation between the length of the front, the depth of the ditches, and the command of the body of the place, in which the exterior sides may at pleasure be longer or shorter within the limits of musketry fire, and the line of parapet may be independent of the line of ditch,—these defects disappear, and its application to every variety of ground is more easy and more economical. As, too, the flanks are entirely protected from distant fire, and the faces are not exposed, or are far less exposed, to ricochet than in the angular traces, the polygonal trace offers greater facilities for the employment of artillery as the principal arm of defence, while it has yet another advantage, viz., that its communications are far more simple.

The main difference between the Polygonal and the Bastioned Systems lies in the arrangements for the defence of the ditches. In the latter it is provided by the flanks of the bastions, in the former by caponnières, powerful casemated works, constructed across the ditches. In the flank of the bastion the guns are exposed, and limited in number by the length of the flank; if the flank be lengthened, the face of the bastion must be shortened, thereby diminishing the direct artillery defence of the bastion, or the flanked angle of the bastion must be diminished, rendering the faces—already too liable—still more liable to enfilade. Moreover, a second or lower tier of casemated guns cannot be added to the flank of the bastion without the suppression of the tenaille and consequent exposure of the curtain; whereas the caponnière may be increased in length to any reasonable extent, and may be in two tiers. Again, in the bastion the flank is enfiladed by direct fire on the adjoining face, and is taken in reverse by the enfilade of that face, and by the direct fire against the opposite face and flank. Lastly, in the Polygonal System a direct fire can be given upon the capital of the angle, while in the Bastioned System this capital is undefended.

The advantage of this system in direct artillery defence appears to be 100 per cent.[1] Brialmont—no mean authority—states it at from 25 to 60 per cent., or even 100 per cent., if the artillery of the outworks is left out of calculation. In a comparison of the fortress of Posen, which is a faulty application of the polygonal system, with an equally strong fortress on the bastioned system, it has been calculated that the siege park of a besieging army would require 20 per cent. more guns for the attack of the former; and the writer goes on to state that more siege materials, a greater development of batteries, a greater number of troops, and a larger park are necessary for the attack of the polygonal as compared with the bastioned system.

Unquestionably, long exterior sides are advantageous for fortresses; and admirably, as has been shown, as the polygonal trace is adapted for fortresses, it is equally well adapted for detached forts, which are often so small that the bastioned trace is inapplicable to them.

Plate V.

The most complete application of this System to a great fortress may be seen in the enceinte of the new fortress at Antwerp, one front of which is shown in Plate V.

In this enceinte the main ditch is wet and wide, and flanked by a powerful central self-flanking caponnière; the flanks are retired and protected by orillons, and the curtain between the latter is broken into two half curtains, separated by a defensible barrack, which forms a retrenched cavalier. The central caponnière is separated from this curtain by a ditch; it is, moreover, covered by a counterguard of two branches, revetted with a loopholed counterscarp gallery from which the countermines diverge; this is further covered by a ravelin of two branches, terminating at the salient in a powerful reverse casemated battery; the ditches of the ravelin are flanked by low casemated batteries. The exterior side is 1100 yards long, the perpendiculars from the centre of this side marking the saliency of the caponnière and the retirement of the centre of the curtain are 104 yards and 71 yards long respectively. The curtain is 250 yards long; the flanks, which are not straight, are formed of two sides, 34 yards and 12 yards long. The flanks of the caponnières are 27 yards long. The salients of the counterguard and ravelin are 190 yards and 295 yards in advance of the exterior side, and the branches of the latter are directed upon points on the exterior line 245 yards on each side of its centre. The front of the defensible barrack is covered by the central caponnière, and the flanks are 84 yards long, forming angles of 100° with the front. The main ditch is 88 yards wide at the salients, and 55 yards wide in front of the orillons; the ditch of the ravelin is 66 yards wide at the salient, and 55 yards wide at the low casemated batteries of its flanks. The ditches are unrevetted, with slopes of two-thirds, except at the head of the central caponnière and in front of the curtain and flanks; the depth of water in them is 10 feet, and its surface is six feet below the plane of site; the berms of the enceinte and of the ravelin are 16 feet and 6 feet wide respectively. The command over the country is, in the body of the place, 32 feet at the salients, falling $1\frac{1}{2}$ feet to flanks and curtains, in the ravelin 15 feet, in the counterguard 21 feet designed that the outworks may not obstruct the fire of the body of the place; in the cavaliers of the salients the command rises to 41 feet. The parapets are slight, not more than 27 feet thick, but they have very wide terrepleins, and are provided with hollow traverses and large bonnettes. The ramps leading to the terrepleins are unusually wide. The guns are either on carriages firing over a 5-feet parapet, or on siege carriages firing from raised gun banks. The armament is heavy, especially in the central caponnières and flanks; in the former, 22 guns on each face, viz., 16 in casemates and 6 in open battery above, in the latter, 14 guns in two tiers. The ravelin has in addition to the guns on its faces 8 casemated guns in its reverse battery of the salient, and 12 casemated guns in its two low batteries; and provision is made for armoring the embrasures of these. The covered-way is 22 yards wide in front of the body of the place, and from 9 yards to 15 yards wide in front of the ravelin. The communications with the country are wide and ample, two through each front; they are also level, very direct, and convenient for sorties.

Epitomized as this description has necessarily been, it will be seen that advantage has been taken very skilfully of a low site and wet ditch, which while offering serious obstacles to the enemy impede as little as possible the offensive operations of the defenders. For the effective defence of the fortress, however, a strong and well-handled garrison, prompt to assume offensive measures, and a large armament are necessary.

---

[1] The German engineer Rimpler, writing in 1673, says that, not being agreed with respect to principles, engineers have disputed about insignificant details, while they have neglected two most important conditions, protection for the garrison from the besiegers' fire, and the concentration of a more powerful fire upon the besiegers.

ENCEINTE OF ANTWERP.

NOTE. The reliefs are given in feet relatively to the plane of site (+ above, − below).

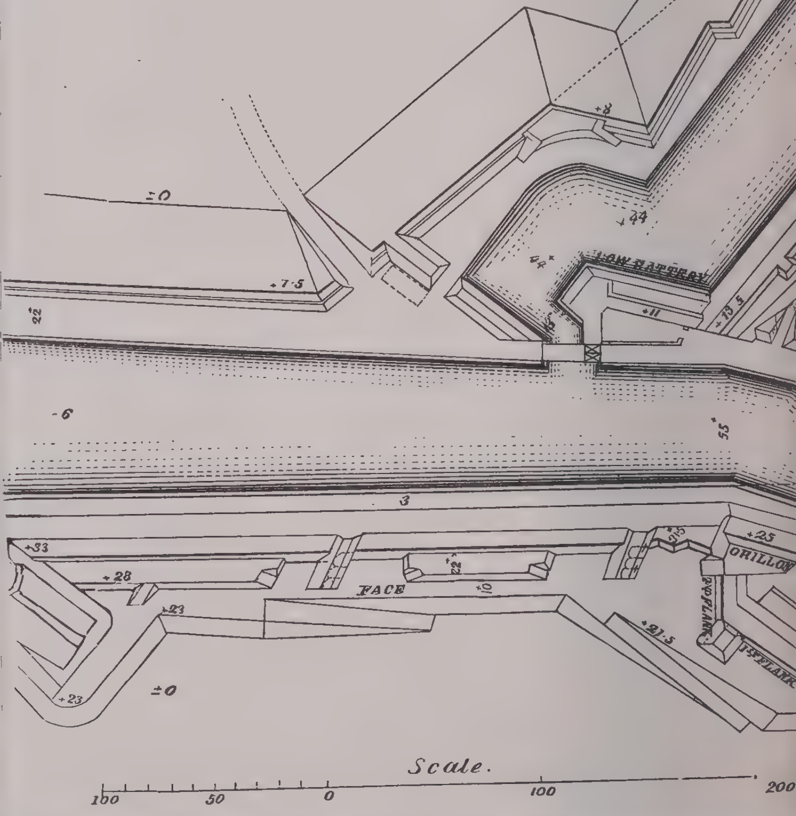
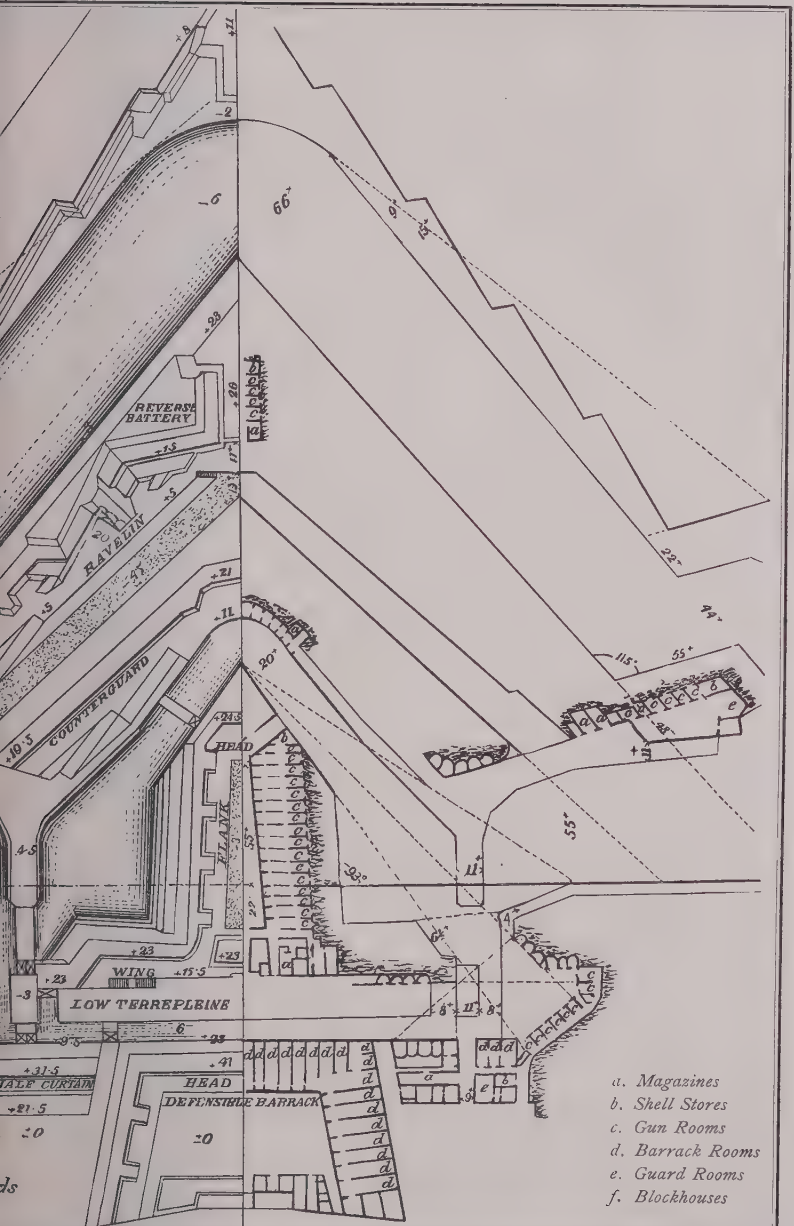
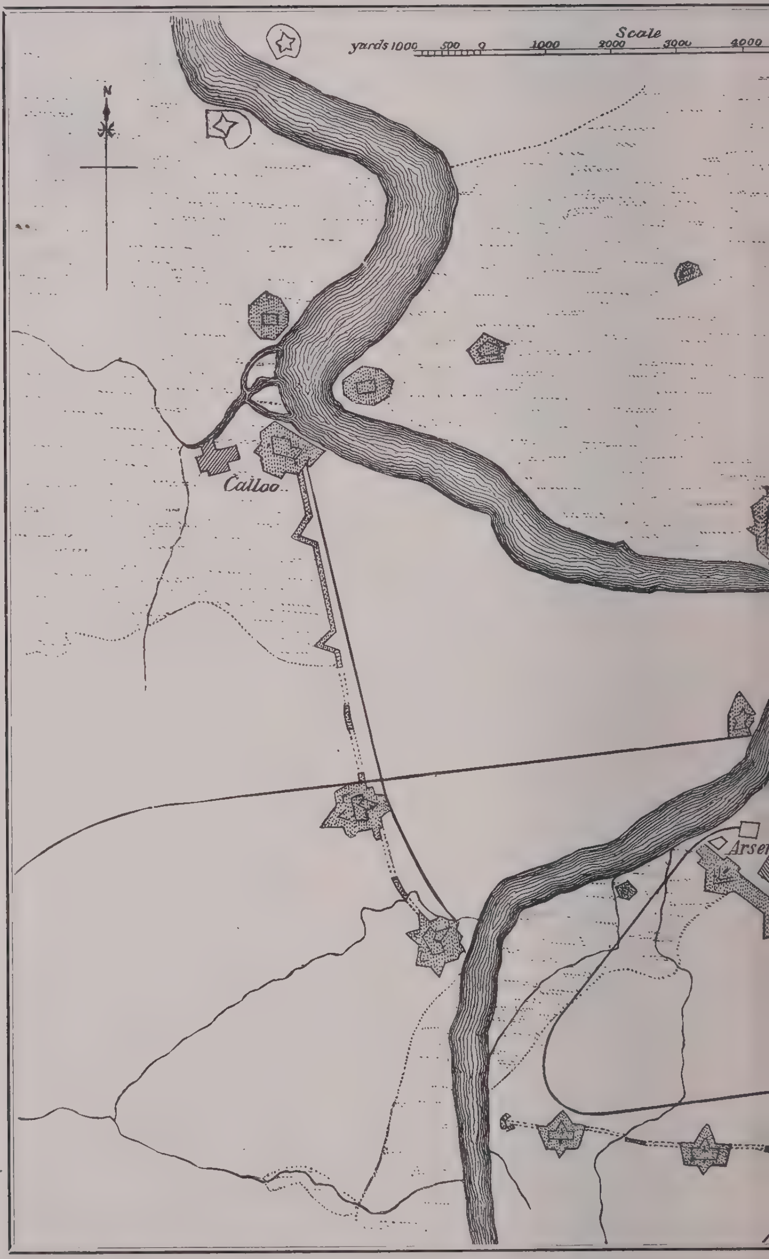


PLATE V.


REVERSE BATTERY
RAVELIN
COUNTERGUARD
HEAD
FLANK
WING
LOW TERREPLEINE
HALF CURTAIN
HEAD
DEFENSIBLE BARRACK
a. Magazines
b. Shell Stores
c. Gun Rooms
d. Barrack Rooms
e. Guard Rooms
f. Blockhouses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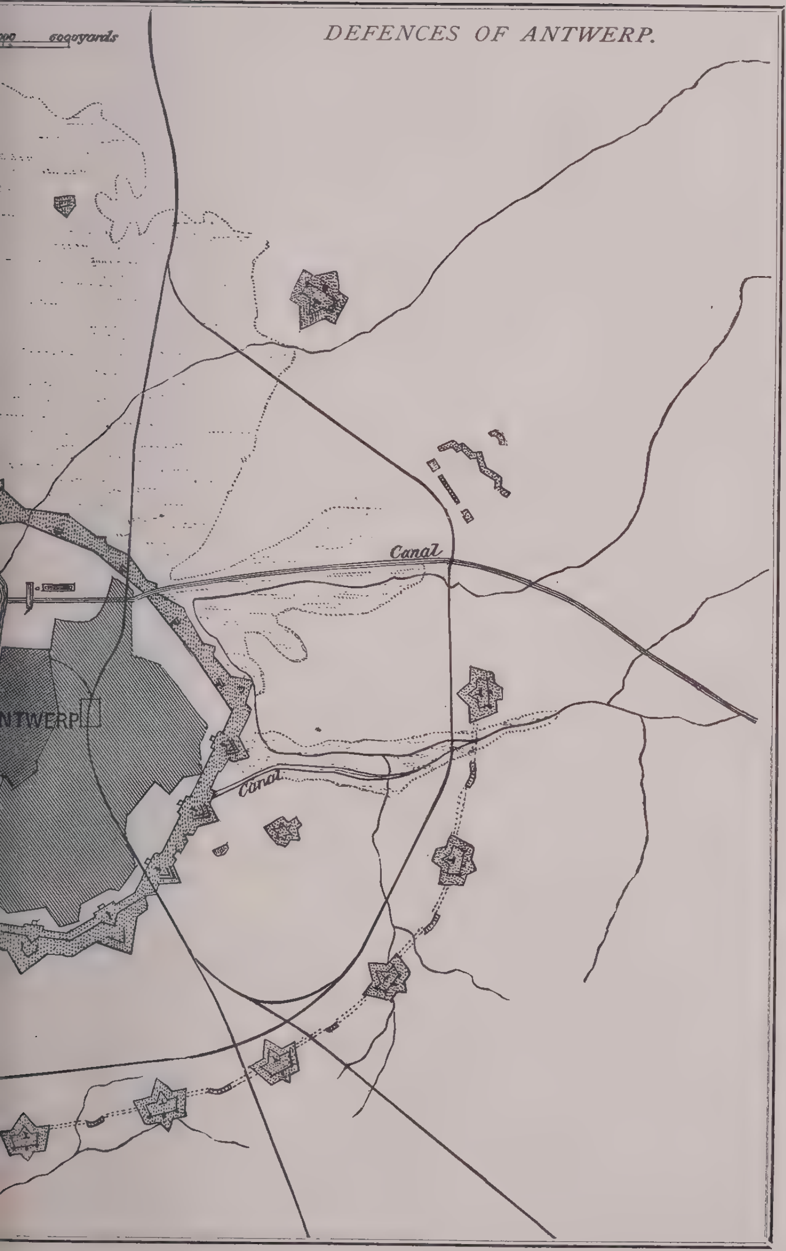
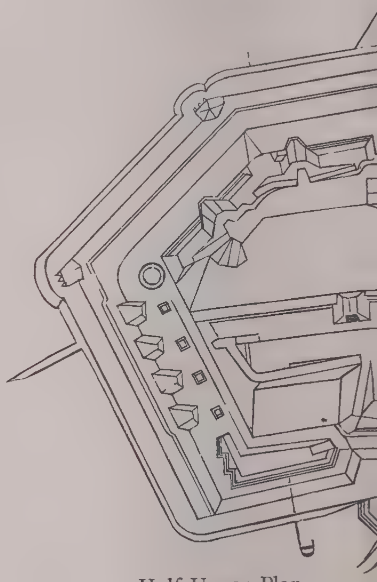


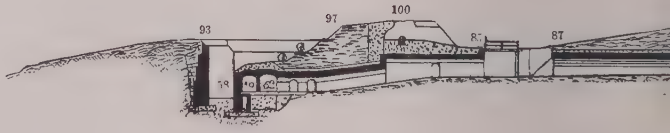
DEFENCES OF ANTWERP.

DETACHED FORT OF POLYGONAL TRACE
OF THE TYPE ADOPTED IN SOME OF THE ENGLISH DEFENCES.



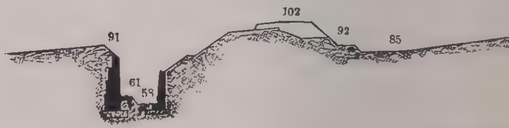
Half Upper Plan.

The levels are in fe



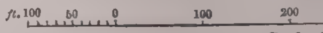
SECTION

⌖ *Inte*

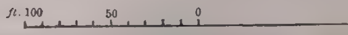


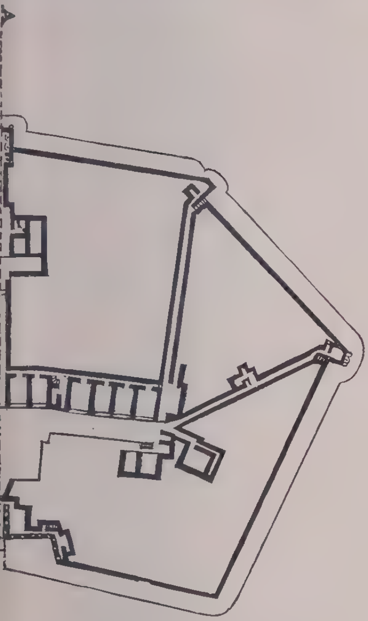
SECTION

Scale



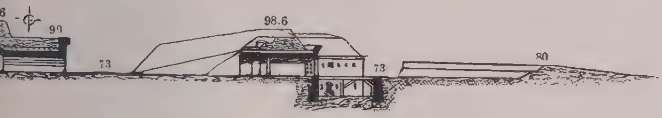
Scale f





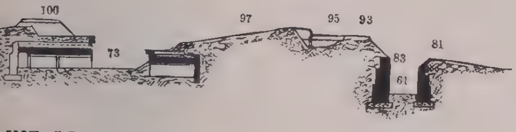
Half Under Plan.

d are Comparative.



LINE A B.

Battery.



LINE C D.

Plan.

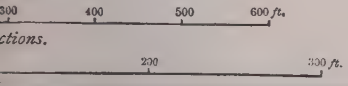


Plate VI. The city of Antwerp, Plate VI., lies upon the east bank of the Scheldt, and was originally closely girt by works of the bastioned trace, of which the last remnant, viz., the old citadel, which joined the new enceinte to the river on the south-west, has recently been removed. This enceinte consists of 11 fronts of polygonal trace in two lines, of which the 6 on the south and east line are about 2300 yards, and the 5 on the north line are about 1800 yards from the town, and are closed upon the river to the north by the new citadel, a work of considerable size and of the polygonal trace also. The fronts are about 1100 yards long, but the two lines join in rather an acute angle; and to compensate for the weakness of the enceinte at this angle, an advanced ravelin has been constructed on either side which prevents the lines from being enfiladed. The length of the enceinte is about 7 miles; but as this line of defence would not keep an enemy beyond bombarding range from the town, a line of 8 detached forts has been constructed about 4000 yards in advance of the enceinte.[1] These forts, also of the polygonal trace, are placed about 2200 yards apart; they close on the river on their right, and, extending over a circle of about 10 miles, rest upon an inundation on their left. Both fronts and forts are very strong, and form a great intrenched camp of about 17,000 square acres in extent. The forts are of the same trace, have wet ditches about 50 yards broad, unrevetted scarps, and bomb-proof accommodation for 1400 men in each; so that to fully garrison the enceinte and the forts about 25,000 men are required. On the west side the river runs in a deep re-entering angle towards the city, and four forts about 2200 yards apart close the space between its bends, and form a very strong defence, placing the city upon this side out of reach of the assailant's fire.

In England the polygonal trace has of late Plate VII. years been habitually adopted as the most suitable for general purposes, but it has not hitherto been found necessary to have recourse to a regular and continuous system of fortification, the insular position of the country, and its predominating strength at sea, calling merely for the fortification of the principal dockyards and military ports, and for the defence of the more important and more exposed harbors. The defence of the military ports is partly on the water and partly on the land, and has been so arranged in the more important ports that they form large naval and military intrenched camps. See Plate VII.

As with modern artillery bombardment is practicable at distances of from four to five miles, the works of defence have been disposed with a view of keeping an enemy at not less than that distance from the dockyards.

Upon the sea fronts the works consist generally of isolated forts, placed, according to the width of the channels, at intervals of 1500 to 2500 yards; these forts, being exposed to the very heavy rifled guns which form the armament of the largest iron-clads of the present time, are protected with shields or walls of iron upon their sea fronts, and when they stand alone in advance of the channel are constructed with a continuous iron wall. The various modes in which the iron composing their armor is disposed will be discussed in a future paragraph. The power of heavy rifled guns is shown in accompanying table.

Table showing the power of the present English Armor-piercing Guns, and of a few of the corresponding Foreign Guns.

	Nature.	Battery Projectile.	Charge.	Muzzle.		Remaining at 1000 yards.		Penetration in inches into unbacked wrought iron plates at 1000 yards.	Remarks.
		lbs.	lbs.	Velocity Feet per second.	Energy in Foot-tons.	Velocity Feet per second.	Energy in Foot-tons.		
Heavy English M. L. R. Wrought iron.	17 in., 100 tons.	2000	375	1545	33000	1407	27484	22	The muzzle energy has since reached 41,000 foot-tons.
“	16 in., 80 tons.	1700	425	1600	30177	1500	26523	22	
“	12·5 in., 38 tons.	810	130	1420	11183	1302	9400	16	
“	11 in., 25 tons.	535	85	1315	6415	1199	5335	12	
“	10 in., 18 tons.	400	70	1364	5160	1228	4185	11·25	It is proposed to increase the length of this from 14·55 to 21 calibres.
“	9 in., 12 tons.	250	50	1420	3496	1236	2648	9·5	
“	7 in., 7 tons.	115	30	1525	1835	1261	1265	7·5	The 7-inch of 6·5 tons may be taken as the same.
Heavy French B. L. R.	12·6 in. (32 cent.), or 34·28 tons.	771·6	138·89	1371	10054	1257	8451	13	
Heavy German B. L. R.	14 in. (35·56 cent.), 56·5 tons.	1143	279·6	1631	21077	1515	18186	18·0	Steel.
Medium French B. L. R.	6·5 in. (16 cent.), 5 tons.	99·3	16·5	1312	1185	1112	760	5·5	A bronze gun.
Medium German B. L. R.	5·87 in. (15 cent.), 3 tons.	61·1	13·67	1608	1096	1440	813	6·0	Steel.

Upon the land fronts the forts are ordinarily placed at intervals of about 2000 yards, though these intervals vary according to the nature of the ground. Where the ground is uneven they are smaller, but where the ground is level 2000 yards should be the least interval, and the forts should be of considerable size; beyond this distance the movement of troops becomes indistinct, and the support afforded by one fort to another is lessened, especially at night and in thick weather. A strong reason for constructing large rather than small forts is that at night or in thick weather offensive measures may often be resorted to with the happiest results. But the garrison of a small fort can never be in a position to undertake such measures; it must always restrict itself to a passive defence, whereas the garrison of a large fort will be able to act offensively, will be in better heart, and better commanded. Brialmont, speaking of small detached forts, says that one of the inconveniences of works of mutual defence is to require a great number of commandants, while in the best armies the men fit to command a fortified place are few.

The trace of these forts is very simple. It ordinarily consists of five sides, the longest of which fronts the enemy; the flank defence of the ditches is provided by three caponnières, one in the middle and one at each extremity of the front face. The ditches are deep, with good scarps, and the defensive power is increased by a keep, which is separated from the fort by a ditch. There is sufficient bombproof cover for the garrison and munitions of war, and the faces are well traversed, while special arrangements are made for the service of the ammunition. The general arrangements may be readily perceived by a reference to the accompanying plan (fig. 64) and sections (figs. 65, 66).

Between the land fronts and the sea fronts the circle of defence is completed by coast batteries. These batteries, which are constructed of earth, concrete, or granite, are of various types, with embrasures protected by iron shields when near the sea-level, but when upon heights not below 100 feet above the sea level, with unbroken parapets, the gun firing over a height of 4 feet 3 inches, the cover for the gun detachment being provided by a "sunken way," 3 feet 9 inches wide and 2 feet 10 inches deep, between the platform and the parapet. Over this sunken way, which is provided with rails, "a loading stage" travels, upon which the charge is brought immediately under the muzzle of the gun.

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[1] A second and still more advanced line of detached forts has been commenced considerably in front of this line.

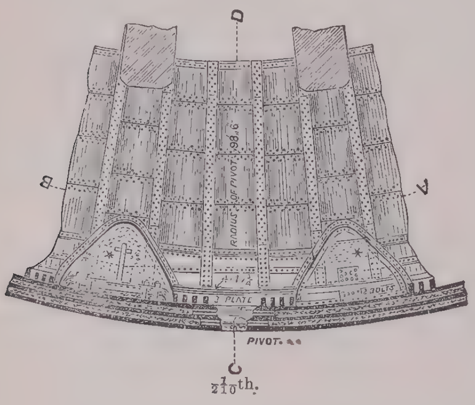

FIG. 64.—Plan of Sea Fort, with continuous Iron Wall. The piers marked (*) are filled with concrete.

Though at this and heights above it the "sunken way" affords fair protection to the gun detachment, except at the period of loading and pointing, yet, at these periods, the men employed upon these services are highly exposed, and at all times the gun itself stands high above the parapet, and offers a good mark to an enemy's ship. Some form of "*disappearing carriage*," upon which the gun is raised above the crest of the parapet at the moment of delivering its fire, and falls by the force of its recoil to a safe position for loading below the parapet, has long been sought for by artillerists. Such a carriage was proposed by Corneille Redeichkeit in 1775 for the defence of the covered-way; but his system, which depended on cords and counterweights, was too cumbrous to move from place to place, and liable to be readily put out of order, and was abandoned. Other inventors endeavored to attain the same end by the use of eccentric trucks and axletrees so disposed that the gun was on the greater axis for firing, on the smaller for loading; but the difference between the heights of the gun in the two positions was so small that this idea was also abandoned. Two guns were next yoked together by ropes, so that one falling from the firing to the loading position raised the other from the loading to the firing position. General Chasseloup, who proposed this twin-gun system, was occupied thirteen years upon its consideration; and though a mode proposed by him, by which one gun recoiling down one inclined plane drew its twin gun up a similar adjoining inclined plane, was tried with some success at Milan, it does not appear to have been adopted elsewhere. The matter then rested until Moncrieff produced his counterweight carriage, in which the recoil, while carrying the gun and carriage under cover to the position for loading, raises and holds up, by means of elevators, a heavy counterweight; this counterweight, when the time for firing arrives, is set free, and by its descent raises the gun to the firing position over a parapet 9 feet high, behind which the gun detachment find ample cover—one man only being exposed while laying the gun. The main objection to this system is the great weight of the accessories, which for the 7-ton gun amount, including the carriage, to 20 tons. This has rendered it impossible to apply this counterweight system to guns larger than 7 tons, and even to these its application is very limited. This system is costly and difficult of execution as compared with barbette batteries, and as compared with casemated batteries is far less secure against plunging and vertical fire, which cannot fail to strike some one of its many parts, a slight injury to any of which must put the gun out of action. It is asserted by its partisans that it can be applied to hill sides, so that the presence of a battery of such guns shall be undiscernible by an enemy; but this assertion is not well founded. So much skilled labor is required for the construction of Moncrieff pits that they cannot be improvised, and when made they are by no means invisible. This system has been used to a limited extent by Great Britain, but has not been adopted in other countries. Brialmont, after describing it, says, "We should not be able to share the infatuation for the Moncrieff carriage which has been manufactured in England;" and, he adds, it is easy to foresee that the earth and rubbish which will be thrown into the battery during the combat will render the working of it slow, difficult and, in some cases, impossible. Certainly the carriage is complicated, and could not be repaired during action.

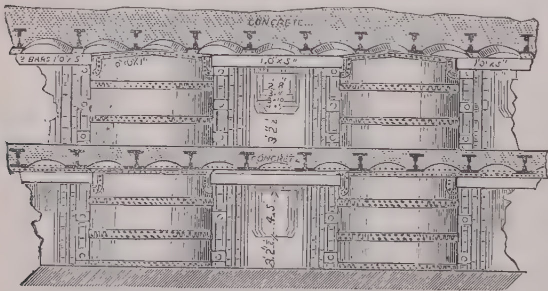

FIG. 65.—Section through AB of Fig. 64.

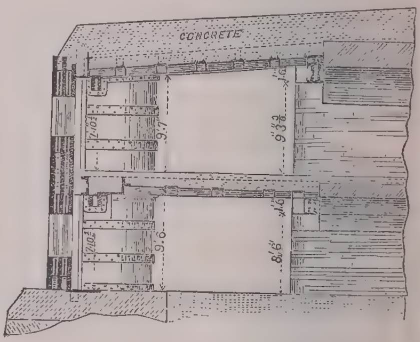

FIG. 66.—Section through CD of Fig. 64.

In earthen batteries protected with iron shields the parapets between the guns are comparatively weak, and, if they be increased in thickness so as to afford sufficient protection, they trench upon the interior space, and interfere with the service of the battery. The parapet, can, however, be strengthened by the insertion either of blocks of cement concrete or of plates of iron.

But as under given conditions the disposition and thickness of armor plates remain the same whatever be the nature of battery or fort in which the armoring is placed, the mode only in which the armoring is fixed being varied to suit the circumstances of each particular case, it will probably best meet the purpose of the present paper to give a short summary of the rise and progress of iron armor in its application to works of defence, illustrated by drawings of the most recent construction of each type of work.[1]

Attention first began to be directed to the application of iron to works of coast and harbor defence about the year 1860. At that time armor was being extensively applied to ships of war, and the manufacture of rifled guns had received considerable development, but iron had not been employed for the protection of defensive works, and nothing was known as to the best principles of construc-

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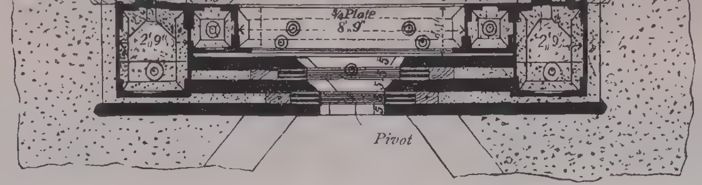
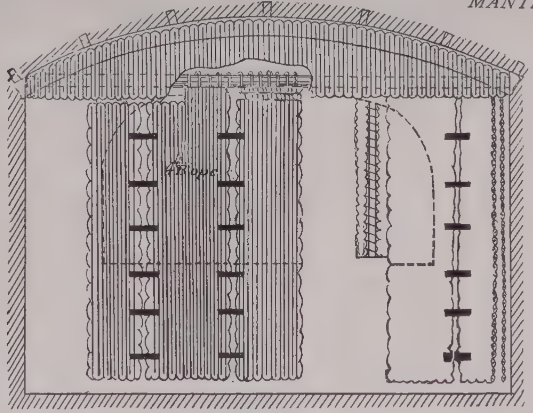
[1] In this part of the subject the writer, in addition to other sources of information, has availed himself of a compilation prepared by Colonel Inglis, R. E., who has designed the principal part of the ironwork of the English sea defences, and who is the highest authority upon iron constructions employed for defensive purposes.

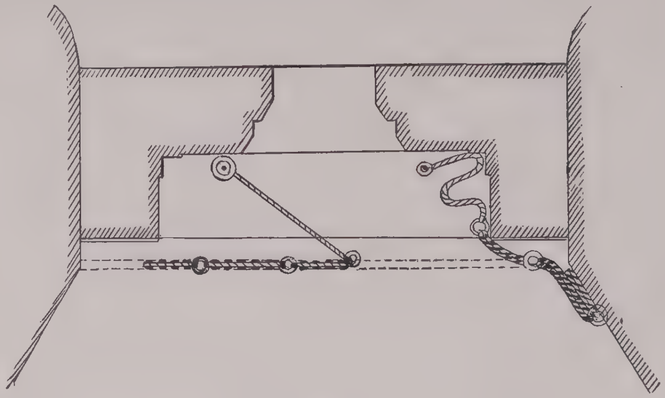


Plan

MANTLET FOR GUN SHIELDS.



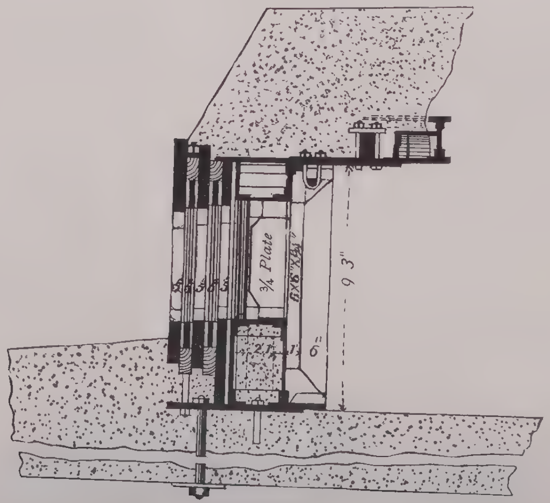
Elevation



Plan

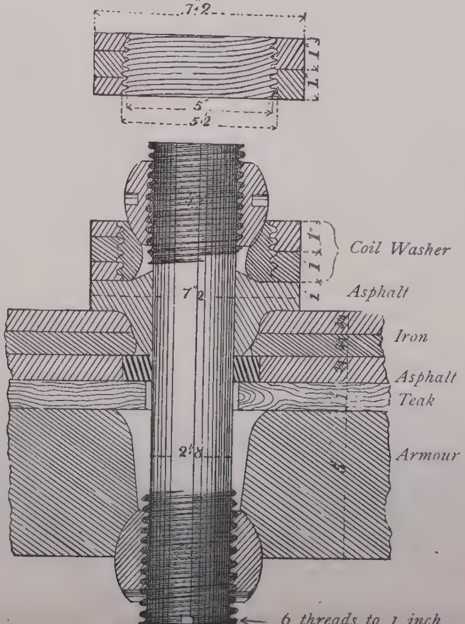
COAST BATTERY.

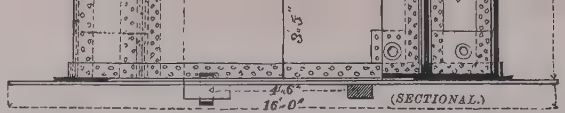
OPEN BATTERY SHIELD.



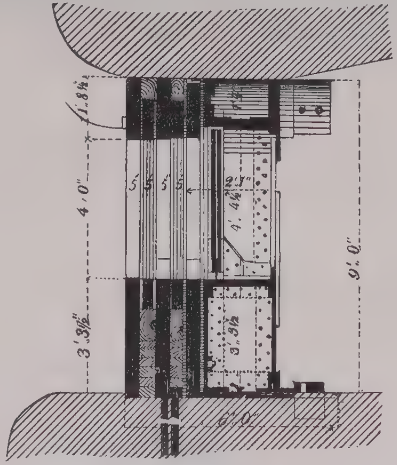
Section

ARMOUR BOLT.

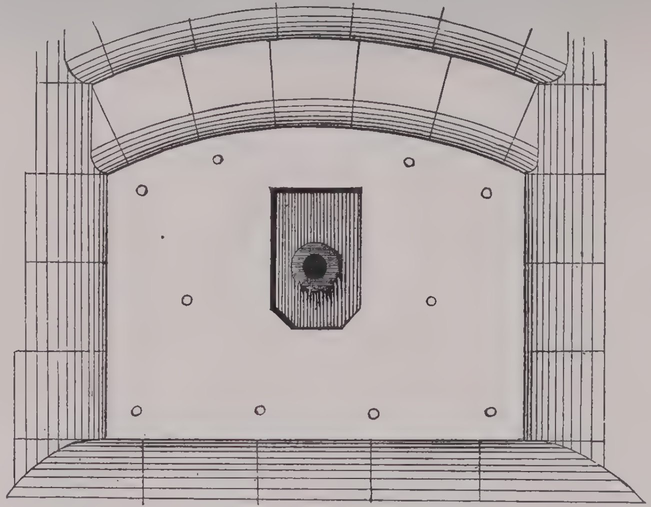




Interior Elevation.



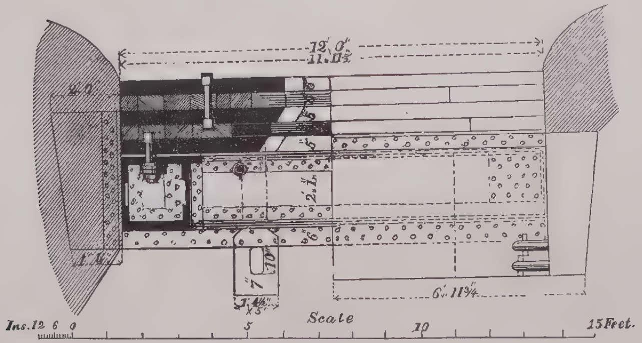
Section.



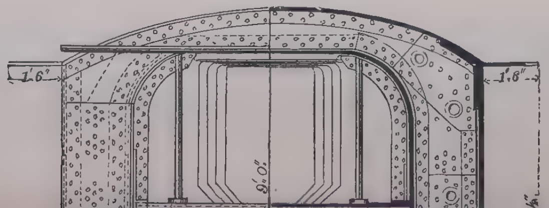
Exterior Elevation.

COAST BATTERY.

CASEMATE SHIELD 9 FT. HIGH.



Half Lower Plan. Half Upper Plan.



tion for iron defences or for the capability of this metal for resisting heavy blows. It was soon perceived that it was necessary to have recourse to experiment in respect to every detail of material and construction, and it was laid down as a fixed rule that no detail should be adopted until it had obtained the stamp of experience. Previous to the period of which we are treating an advance in this direction had been made in America in 1855, by the application of metal (lead) concrete to masonry embrasures (but this did not withstand the smooth-bore guns of that day), and at Portsmouth in 1859, by the construction of an embrasure shield, 14 inches thick, of rolled iron bars, which opposed a fair resistance to wrought iron shot from the 68-pounder smooth-bore gun, the most effective gun at that date. In 1860 the most important of the preliminary trials took place against an ordinary embrasure with an iron throat 8 inches thick. The guns used were the 40-pounder, 80-pounder, and 120-pounder (shunt) Armstrong rifled guns, and the 12-ton gun, with cast iron shot. The embrasure gave way, and it became apparent that the accuracy of rifled guns rendered splayed embrasures inadmissible in such positions. About this time, too, experiments with plates of various thicknesses in different positions—vertical, and inclined at angles varying from 10° to 60° with the horizon—showed amongst other results that a given mass of armor plates in a vertical position offered as much resistance as the same mass disposed over the same vertical height in an inclined position. In all these experiments the backings and fastenings occupied important positions. Targets were accordingly made with elastic backings, without elastic backings, and with compound backings of various kinds; but the general result of trials against these targets was to establish the advantage of elastic backings. The armor plates were fitted mechanically without bolts or rivets, were fastened with bolts, and were fastened with continuous riveting round their edges; the result of the experiments established the superiority of bolts as fastenings for armor plates. Many more experiments had, however, to be made before the proper form of bolt was settled; these were by no means the least interesting of the experiments made in working out this subject, but space does not avail to give the history of them here; and it may be sufficient to say that a bolt has been adopted about 3 inches in diameter in the shank, or rather less than the lesser diameter of the screw, which has a rounded thread (about 6 to the inch) and a shallow rounded cut; that the bolt holes are made one inch larger in diameter than the bolts; that the edges of the holes are coned, and that cupped washers receive the nut on the inner end, which is cup-shaped (as is the washer of the front of the bolt) as shown in Plate VIII.; and that various minor arrangements have been made for inducing gradual action, and so relieving suddenness of strain upon the bolt. Finally these bolts are made of special iron of a fibrous nature, and elongating from 35 to 45 per cent. under pressure.

Plate VIII.

The law of the resistance of armor plates received early investigation during the course of these experiments. Sir W. Fairbairn, supposing that the resistance of armor plates to the impact of a shot was analogous to the resistance of plates to a punch, deduced this general formula (C being made equal to 3,374,900):—

$$\text{Thickness of plate perforated} = \sqrt{\frac{\text{WO}^2}{\text{CR}}}\,.$$

Sir W. Armstrong endeavored to ascertain the resistance by the application of the dynamic theory of heat. Captain Noble, R.A., from many experiments, concluded that the penetration of steel shot is directly proportional to the work in the shot, whether a heavy shot with a low velocity or a light shot with a high velocity be employed; and that the resistance of armor to steel shot varied as the $\frac{3}{2}$ power of its thickness. But Captain English, R.E., who appears to have treated this subject most scientifically, considers that the energy absorbed by a plate in resisting a shot is made up of the energy expended in enlarging an indefinitely small hole through the plate, and of the energy absorbed in frictional resistance, and is equal to the cube of the diameter of the shot multiplied by a constant—a separate constant being required for each proportion to the diameter of the shot, of depth of indent in the one case, and thickness of plate in the other.

Having obtained a law which can be relied upon for thick armor plates (it is not, however, applicable to very thin plates), the mode in which the iron in an armor-plated wall should be disposed, *i.e.*, in one solid plate or in two or three thicknesses of plates, was shortly settled. A comparison of experiments against 7 inches of iron armor plate disposed in one, two, and three thicknesses gave resistances in the proportion of 100, 96, and 89. Further experiments against single and double plates of 5 inches showed that the double plate offered nearly three times the resistance of the single plate; and finally a comparison between a 15-inch plate and three 6-inch plates showed that though the solid plate offered slightly more resistance to a single blow it broke up sooner under repeated blows than did the three plates; but as, of course, there is a limit in manufacture to the mass of an armor plate, it is evident that the thicker the plate the more numerous will be the joints in a given area, and if the armor be in one thickness, all these joints are lines of weak resistance. The disposal of the joints, then, is a matter of first importance in designing iron structures, and in this respect the arrangement in several thicknesses, or the plate-upon-plate system, as it is called, offers the greatest advantage, for the plates can be so arranged that no joint goes through more than one-third the thickness; moreover, this system is more easy and more economical in construction, and can be strengthened with greater facility at any future time.

In order to put the conclusions arrived at to practical test, a shield for a casemate opening 12 feet long and 8 feet high was constructed of three 5-inch plates placed at intervals of 5 inches, the intervals being filled with iron concrete; the plates were whole, each covering the entire opening, and each was bolted to the plate next to it, the inner plate being bolted to the shield frame in rear; the front plate was secured by 10 bolts, the others by 8 bolts each; the total weight of the shield was 56 tons 8 cwt. It was struck with 16 shot from 25-ton, 18-ton, and 14·5-ton muzzle-loading rifled guns at 200 yards distance; the average energy of each blow was 5321 foot tons, and the aggregate 90,000 foot tons,—upwards of 1000 foot tons per foot superficial of the shield's face; but the shield was not driven out of shape, and its back or interior face was uninjured.

This experiment was so satisfactory in its results that henceforward there was no hesitation with respect to the broad principles of armor construction, and it only remained to adapt these principles to the different cases which presented themselves. These are sufficiently illustrated by the drawings in Plates VIII. and IX. The first is an open battery shield for an opening 9 feet wide and 7 feet high; the second is an ordinary casemate shield 12 feet wide and 9 feet high, and the third is a portion of an isolated sea fort with an exterior iron wall. The application of iron has facilitated improvements in the construction of the roofs of bomb-proof buildings, and the form of roof shown in the sea fort may serve as a model of construction of this kind. It is composed of arch plates of $\frac{3}{4}$-inch iron curved to a radius of 5 feet 6 inches, springing from iron girders 1 foot 9 inches deep and 1 foot 2 inches wide. The arch plates are covered with brick arches, which are again covered with 3 or 4 feet of Portland cement concrete. This roof is equal to a load of one-half ton per foot superficial, with a tensile strain upon the iron not exceeding 5 tons per square inch. Such a roof covered with 5 feet of earth was tested by vertical fire of 13-inch mortar shells at 1000 yards. The few rounds which struck it produced no effect, and after the 298th round practice was discontinued; but the earth was removed, and the bared concrete was struck by a shell, which only produced an indentation of 8 inches.

Plates VIII. and IX.

The cost of iron structures is, however, a drawback to their more general employment,—so much so that only wealthy nations can afford to erect them, and but in limited numbers. The cost of an open battery shield may be stated at £800, its weight 10 tons; of a casemated shield, £1800, its weight 40 tons; of an iron-walled fort, £5550 per gun, its weight 125 tons per gun.

It is, however, to be observed that, in special cases where the forts are constructed in very deep water, and where, consequently, the increase in the quantity of masonry in the substructure becomes very great for every additional foot of radius, an iron-walled fort, which admits of the guns being placed in a comparatively very small area, is the most economical method of construction, and that for constructive purposes a circle is the best form of such fort.

In all forts designed for very heavy guns special provision becomes necessary for the ammunition service of the guns. The cartridge and shell stores are kept separate, and are provided in the proportion of one of each for each gun, or each pair of guns. As a rule, these stores are securely placed in the basement under the gun they supply, the cartridges and projectiles being raised by mechanical appliances through "lifts" in the heart of the building to the rear of the gun. The ammunition stores are lighted by lamps placed in "light chambers," separated from the stores by thick plate glass; these "chambers" are entered from passages entirely distinct from the passages used for the service of the ammunition. The proper organization of the ammunition service is of the utmost importance for the efficiency of the fort; by it the labor of the gun detachment is lessened, and the rapid service of the gun facilitated. Each gun chamber is in speaking communication, by means of tubes, with its own ammunition stores, so that the men in the latter, though absolutely shut in below during action, still form part of their own gun detachment. Finally, the guns of the fort are collected into groups for purposes of command, and the guns of each group are directed from a "look-out" place constructed on the top of the fort, which is in speaking communication with each gun of the group.

It has been found that when armor is struck by a shot, lining of some kind is necessary to deaden the effect of vibration and sound, and to act as a target to receive, and protect the gun detachment from splinters thrown off from the interior. This lining should be flexible, so that it may be drawn close round the gun while it is being discharged, thereby keeping the smoke out of the gun chamber, may reduce the effect of blast and concussion, and may prevent splinters and balls entering through the port. No material has been found to answer so well as rope, and "mantlets," as such appliances are called, are now invariably made of this material. The only drawback to rope is its liability to catch fire, but this is entirely obviated by washing it with a saturated solution of chloride of calcium.

There are two other forms in which iron has been applied which should not be passed by without notice, viz., "curved-fronted shields" and "turrets." In the former the casemate is of the ordinary character, but the shield frame, which is constructed with a sharp curve of 13 feet or 14 feet internal radius, is more difficult to make, and more costly. Two ports of the usual dimensions are formed in the shield, and the gun is placed behind it upon a turn-table, on which racers are laid so that the gun will fire through a lateral arc of training of 60° at each port. The gun is transferred at pleasure from one port to the other by the movement of the turn-table, and commands an arc of 120°. The weight of iron is 150 tons per gun, the cost £7500 per gun; but in considering the cost of this arrangement it should be observed that by it one gun does the work of two.

Plate X.

In the turret one or two guns are placed in the interior of a cylindrical wall of iron armor closed overhead with ordinary bomb-proof covering. The turret with its contents is revolved by steam or other motive power, so that each gun commands a whole circle. Various arrangements have been designed for the service of the gun,—in one the loading is done inside the turret, in another under the glacis, in a third while the turret is being turned to the rear,—but whatever the arrangement, no time need be thereby lost, as the guns may be so placed that one revolves into action, while the other revolves out of action for loading. It would seem that a breech-loading arrangement for heavy guns would lend itself more readily to the turret form of construction. With an armament of breech-loaders, the turret might be reduced in internal diameter; the port opening need be no larger than the chace of the gun, which would not have to be withdrawn for loading, and which is laid by means of a small aperture contrived in the roof of the turret—the man who lays the gun having the machinery under his hand, and "training" the turret and gun himself in any direction. In turrets provision is made in the basement in the usual way for the accommodation of the garrison, and for the storage and service of the ammunition, as well as for the motive power and machinery. Special arrangements are made for ventilation and for the escape of smoke. The surface of the exterior to a certain distance in advance of the turret is plated with iron and sloped upwards "en glacis," so as to cover the base of the turret, and protect the turning gear from dislocation under the blows of heavy projectiles. See Plate X., fig. 1.

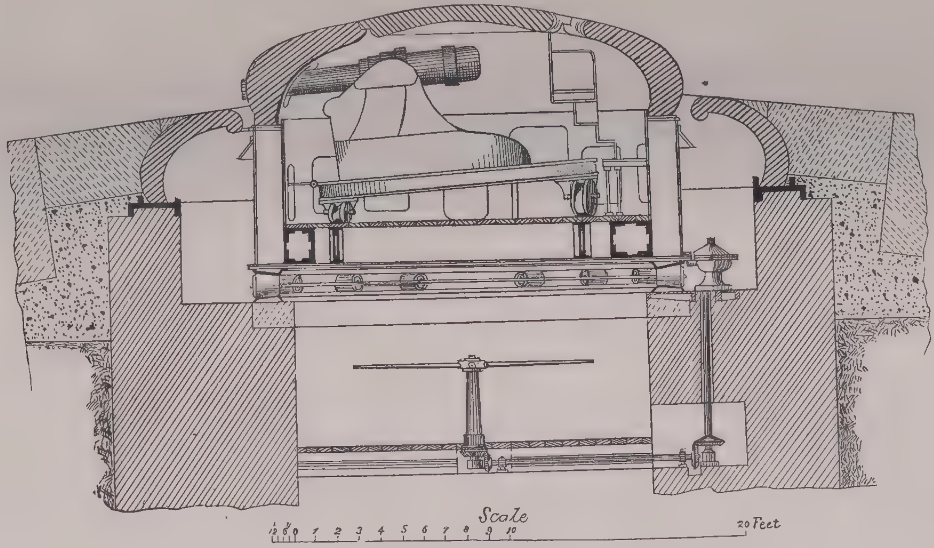
Before quitting this subject it may be well to offer a few remarks on the employment of cupolas or turrets on land defences. Either of these forms of iron construction may be advantageously employed in advanced positions where it is necessary to retain guns until the very last—such as the salients of ravelins, and in the angles of fronts of fortifications; also in points which are commanded from heights in their vicinity. As these constructions are indestructible by the direct fire of siege guns, and are absolutely safe from enfilade and reverse fire, they confer very great advantages upon the defence. They should mount heavier guns than can be brought against them; they cannot be silenced by the concentration of any number of light guns, and, judiciously used, they should place the artillery defence above the artillery attack. They render the construction of the first batteries of attack far more difficult, and force them to open at a greater distance from the place; and, at any period of the attack, they can meet its artillery with heavier metal. The guns of the attack are practically limited to about the calibre of the 64-pounders, and comparatively light armor will withstand these, and will preserve in security and render more easy the service of guns at least two calibres higher. Such constructions have been made by the Belgians in the detached forts round Antwerp and in Antwerp; by the Germans in the detached forts round Metz and in Metz, on the Rhine, and on the Weser; and by the Russians. In England there has as yet been no occasion to resort to them.

In some at least of the places mentioned above, a system of construction and a material advocated by Grusen have been employed; a type is shown in Plate X., fig. 2. The plates which are made of chilled cast iron manufactured by the Grusen process, are fitted together, without screws or bolts, in a simple manner. Each plate is a segment of the cupola, and is grooved at the edges; the segments are placed in position, and melted zinc is poured into the grooves, forming a close and solid joint. A glacis similarly constructed protects the base, which is set in motion by hand machinery. The interior arrangements do not differ in principle from those described above for turrets. It is said that such a turret weighing 133 tons can be made to revolve round the whole circle by four men in three and a half minutes. Its cost is about £16,000.

The Grusen metal is reported to have a very hard exterior surface, with great interior toughness and tenacity, and may probably be used with advantage in cupolas for land defence; but the experience in England does not lead to the conclusion that it is a suitable material for resisting the extremely heavy projectiles carried by the war ships of the present day. Particular attention has been directed to the nature and manufacture of armor plates in Britain, and, up to the present time, the results afforded have been most satisfactory. The iron employed is best described in the wording of the specification for manufacture, viz.:—"The plates must be soft, fibrous, thoroughly welded, and capable of offering good resistance to cannon shot, without indication of brittleness, and without the separation of the several moulds of which they may be composed." This specification was adopted after many experiments with hammered and rolled plates, in which the former, in consequence of the absence of fibre, conspicuously failed in comparison with the latter.

The best material for armor plates is, however, again prominently under consideration; so great an increase in penetration was obtained with chilled iron shot that the manufacture of steel projectiles was stopped as far back as 1866. Great advances have since taken place in the processes by which steel is made, and steel projectiles of great penetrating power have recently been under trial; by the use, too, of prismatic powder disposed in cartridges with a definite amount of air space, by which the combustion is rendered more gradual and more thorough, a far higher velocity is obtained with a materially diminished strain upon the chamber of the gun. This has rendered it possible to enlarge the chambers of the heavy guns and to increase their lengths by several calibres, with a resulting increase in energy of about one-third, so that a plate which would keep

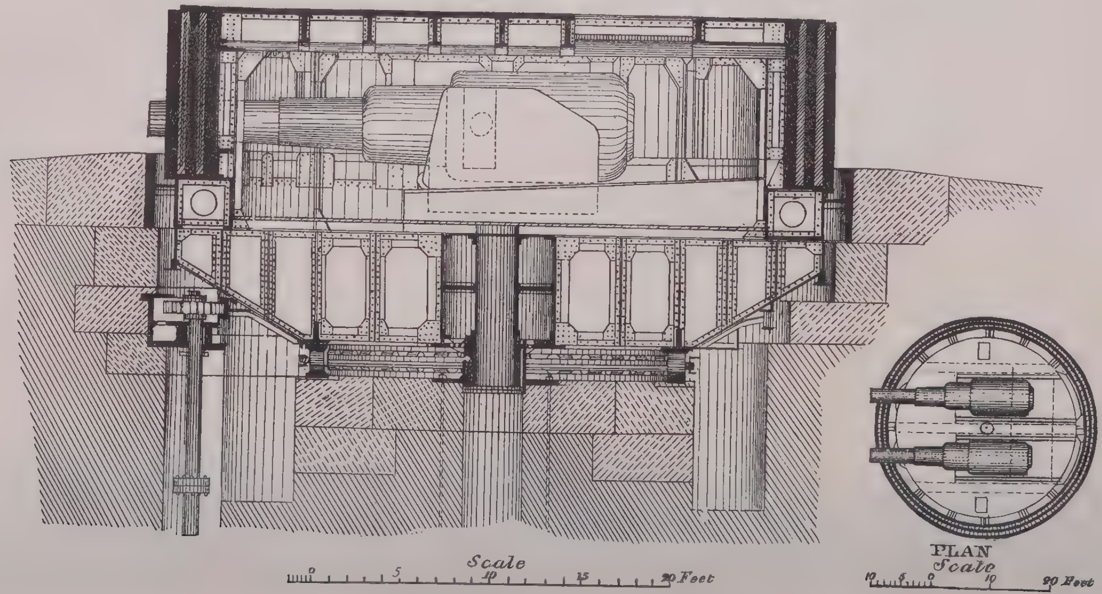
Fig. 2.



SECTION.

CUPOLA FOR LAND DEFENCE
OF CHILLED CAST IRON,
AS ERECTED ON THE CONTINENT.

Fig. 1.



IRON TURRET FOR TWO HEAVY GUNS,
DESIGNED FOR ENGLISH SEA DEFENCES.

out a projectile of 800 ℔ weight from a 38-ton gun will now barely keep out a projectile of 400 ℔ from an 18-ton gun. It is not impossible, however, that by a combination of iron and steel the resistance of armor may be again brought up to the penetrating power of projectiles. During this consideration many curious and unexpected results have been obtained, but they have not been reduced to such a form at present as to modify what is stated above. The whole question is, however, full of interest, and will, it may be anticipated, receive considerable development before long.

Armament of Fortresses.

The Systems of Fortification having been briefly described, it is right to say a few words here respecting the means of defending a place after it has been fortified. It is difficult to lay down exact rules as to the proportion of ordnance, ammunition, and stores of all kinds required for the defence of a fortified place, seeing they must necessarily vary according to the particular situation of each fortress, the system on which its works have been constructed, and the species of attack to which it may be exposed. If, for example, one of the sides be covered by a morass, swamp, or other obstruction which it is difficult or perhaps impossible to surmount, it must be obvious that a smaller proportion of artillery will be required than if the fortress were equally accessible on every side; and, on the other hand, a maritime fortress, accessible at all points, will necessarily require for its defence a larger proportion of ordnance than if it were only assailable on one or a few of these points. Where every front is equally exposed to attack, all must be equally prepared.

On this subject, however, certain maxims have been established, of which the following appear to be the most important. First, the proportion of ordnance, ammunition, and stores should never exceed the quantity necessary for a brave and resolute defence. Secondly, those fronts which are considered the most exposed to attack should be the most completely armed, whilst a partial armament of the remaining fronts may suffice. Thirdly, to the front to be attacked the following pieces of ordnance should be allotted, viz., to each Bastion, 1 for the salient, 5 for each face, 3 for each flank; to the Ravelin, 5 for each face; to the Lunette, 3 for each face, and a few pieces for the places of arms in the covered-way;—so that if one front be completely armed, the proportion of ordnance will be 17 for the Bastion, 10 for the Ravelin, 6 for the Lunette, and 6 for the places of arms,—in all a total of 39 pieces for the front. This proportion is less than has been fixed by many authorities, but the range and accuracy of guns have so increased since the introduction of rifled ordnance that it will be necessary to provide a traverse for every gun on the most exposed faces, and this, while it affords security to the artillery, materially diminishes the space available for mounting guns. It may be thought by some that this arrangement provides too much traverse shelter, but a few well-protected and well-served guns are better than double the number in exposed positions. Fourthly, when a place is exposed to attack on two contiguous fronts, the armament of each should be augmented one-half; when it is threatened with attack on detached fronts, the armament should be doubled. Fifthly, each of the other fronts should merely be provided with such a proportion as to secure it against insult. From this it may be assumed that a hexagon having only one front liable to attack should be completely armed on the two adjoining fronts, and that about seven guns per bastion and seven per outwork will be sufficient for the remaining fronts, and that a total of 178 pieces of ordnance will be sufficient for a hexagon.

The next consideration is the proportion which the several kinds of ordnance should bear to one another. Ordnance of the higher calibres is not the only ordnance which ought to be employed; in many cases medium and light guns are more efficacious; for when only troops or working parties are to be fired at, light guns will answer every purpose; their range is nearly equal to that of larger guns, and they are more manageable and may be worked with greater rapidity. Short guns of heavy calibre which throw heavy charges of case and shrapnel are best adapted for the flanks; and, generally, the largest or heaviest ordnance should only be employed to destroy the besiegers' batteries and dismount their guns. The light guns, as they can easily be withdrawn, should be placed in the covered-way, in the places of arms, and in the outworks of every description. The heavy guns and mortars, which are not so easily moved, should be within the body of the place, and as they require large charges of ammunition, they should be less frequently used, and only upon urgent occasions. A judicious economy of ammunition is a duty incumbent upon every commandant of a fortified place. The conduct of General Chassé in the defence of the citadel of Antwerp was a model in this respect. From the commencement till the close of the attack, scarcely a single shot was needlessly expended by the garrison.

Attack and Defence of Fortified Places.

Having brought the discussion of Permanent Fortifications to this point we may now consider the attack of fortified places, the general system of which was introduced and perfected by Vauban, so that it has ever since served as a model for the plans of his successors.

> "La résolution des siéges," says the Marshal, "est une affaire de cabinet. Elle est une suite naturelle de la supériorité que l'on croit avoir sur ses ennemis; mais leur exécution étant une des plus sérieuses, des plus importantes, et des plus difficiles parties, elle demande aussi le plus de mésure et de circonspection." He then goes on to state that the success of sieges depends on several circumstances, such as "1. Du secret, sans lequel il est difficile de réussir; 2. Des forces que l'on a sur pied pour attaquer les places des ennemis, et défendre les siennes; 3. De la disposition des ennemis; car s'ils sont réunis, et aussi forts que nous, ils peuvent nous empêcher d'en faire; 4. De l'état des magasins les plus à portée des lieux sur lesquels on peut entreprendre; 5. De la conjoncture des tems, parce que tous ne sont pas propres aux siéges, et rien n'étant plus ruineux que ceux d'hyver, on les doit éviter tant qu'on peut; 6. Des fonds nécessaires à leurs dépenses; car l'argent est le nerf de la guerre, sans lui on ne sçauroit réussir en rien. Ce sont là des mésures à prendre de longue main, qui doivent être dirigées à loisir; et aprés tout cela, quand on croit les avoir bien prises souvent tout échappe; car l'ennemi, qui n'est jamais d'accord avec vous, pourra vous interrompre. . . . Il faut bien peser toutes ces considérations, avant que de se déterminer; et prendre toujours si bien son tems, que l'ennemi ne puisse vous tomber sur les bras avant vos établissemens."[1]

A siege, therefore, being one of the most arduous undertakings in which an army can be employed,—one in which the greatest fatigue, hardships, and personal risk are encountered, and in which the prize can only be won by complete victory,—it is obvious that upon the success or failure of such an enterprise may depend the fate of a campaign or of an army, and perhaps the existence of a state. Of this the failures before Pavia in 1525, before Metz in 1552, before Prague in 1557, before St. Jean d'Acre in 1799, and before Burgos in 1812 present instructive examples. By the first France lost her monarch, the flower of her nobility, and all her Italian conquests; by the second, she was saved from destruction, whilst 30,000 of her enemies perished; by the third, the greatest warrior of his age, Frederick the Great, was brought to the very brink of destruction; by the fourth, the most successful general of France, and perhaps the greatest commander that any age or country has produced, was stopped short in his career of victory; and by the last, a beaten enemy gained time to recruit his forces, concentrate his scattered corps, and regain that ascendency of which the victory at Salamanca had for a time deprived him.

It is therefore of the greatest importance to a state that the sieges undertaken by its armies should be carried on in the best and most efficient manner possible, or, in other words, that by a due combination of science, labor, and force these operations should be short and certain, and without excessive expenditure of life. But the sieges undertaken by the British have seldom, if ever, united these three indispensable conditions; and with regard to those which took place during the contest in the Peninsula, it is well known that defects of organization, particularly the want of a body of men, such as sappers and miners, trained to the labor required at sieges, and an inadequate supply of material, necessitated a partial departure from established principles and rules of attack, which led to a waste of life unprecedented in modern sieges. Till late in 1813 the army had not a single sapper or miner; regular approaches were therefore difficult if not impracticable. It was necessary, in almost every case, to take the bull, as the saying is, by the horns; the last operation of a siege scientifically conducted, namely, battering in breach, was amongst the first undertaken; and the troops, marched to the assault whilst the defences remained nearly entire, were exposed to every species of destruction which the unreduced means of the besieged could bring to bear against them. The army of a country which has outstripped all others in the useful arts and in mechanical improvements was left wholly unprovided with those appliances which at once economize life and labor, and serve to render both most effectual for the purposes to which they are applied. Nevertheless, it may be observed that, in all periods and in all countries, the means employed for the reduction of fortresses have generally increased and become more overwhelming and irresistible in proportion to the advancement of knowledge and to the improvement of the useful arts; and that in Europe during the last two centuries, the extension of wealth and knowledge, accompanied by an unprecedented development of talent, directed towards military movements, has caused the results of sieges, and indeed of almost all the operations of war, to depend much less on individual exertion or casual displays of heroism, than on combination and expenditure. This may be made apparent by a slight retrospect of the sieges of the 16th century.

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[1] *De l'Attaque et de la Défense des Places*, pp. 1 and 2. Hague, 1737, 4to.

At the period referred to, the art of disposing the several works of a fortress so as to cover each other, and to be covered by their glacis from the view of an enemy, was unknown; whilst the limited supply of artillery, its unwieldiness, and the great expense and difficulty in moving it rendered it so little available for sieges, that the chief object in fortifying towns was to render them secure against escalade and surprise, by means of lofty walls or altitude of situation. All places fortified prior to the 16th century are invariably of this construction. And as the simplicity of the fortresses to be attacked necessarily gave the same character to the operations directed against them, so, in those days, much was effected by daring courage, without the aid of science; and gallantry in individual combat, and fearlessness in confronting danger, were esteemed the highest qualities of a besieger. Thus contests dragged on for months, in petty but sanguinary affairs, and the most persevering or the most hardy troops, however ill organized or supplied, were the most dreaded, and not unfrequently the most successful. But when artillery became more movable, and large quantities were employed in sieges, lofty and exposed walls no longer opposed an adequate barrier; large breaches were speedily effected; places which had formerly resisted for months were carried in a few days; and so, in order to restore an equality to the defence, it became necessary to screen the ramparts from distant fire. The attempt to gain security by concealment rapidly advanced, whilst the means of the besiegers remained the same; and between the middle of the 16th and commencement of the 17th century works were so skilfully disposed and so well covered that the defence of towns obtained a temporary superiority over the attack. Of this the obstinate and successful defences made by the Dutch against the Spaniards during the reigns of Philip II. and Philip III. may be cited as remarkable examples.[1]

The pre-eminence of the defence over the attack was mainly due to the great difficulty of dragging up heavy ordnance with a besieging army, so that, the weight of metal being generally in favor of the besieged, the fire of the fortress was able to subdue that of the batteries of attack Vauban, however, in the reign of Louis XIV., restored the preponderance of power to the attack by the invention of ricochet fire, as the guns of the besieged were thereby dismounted or disabled at an early stage of the siege, and the besiegers being relieved in great measure from the effects of a direct and powerful fire of artillery, were enabled to push forward their approaches by the sap. Vauban also matured into a system the attack, by laying down rules for the establishment of parallels, for the position of enfilade and other batteries, and for the general conduct of the approaches. The real type of an attack is a *moving parapet*, the besieger carrying forward with him his cover, and thus depending for his success not so much on his offensive as on his defensive arrangements. It was by this combination of science and labor, aided by the steady advances of brave and well-trained sappers, that the reduction of fortresses which would have resisted for ever the rude assaults of the most determined enemy was rendered comparatively easy and certain.

These increased means of attack, to which it was found impossible to oppose a successful resistance, caused the art of concealment or covering to be further studied, till at length, in well-constructed fortresses, not a single wall remained exposed to view, and the sap and the mine became as necessary as the gun and the mortar to the success of a besieger. To render this intelligible to the general reader, a descriptive sketch of the progress of a modern attack, from the excellent work of Sir John Jones already referred to, is introduced here.

> "The first operation of a besieger," says that able and experienced engineer, "is to establish a force able to cope with the garrison of the town to be attacked, at the distance of some hundreds of yards from its ramparts. This is effected by approaching the place secretly in the night with a body of men, part carrying entrenching tools, and the remainder armed. The former dig a trench in the ground parallel to the front to be attacked, and with the earth that comes out of the trench raise a bank on the side next to the enemy, whilst the latter remain formed in a recumbent posture, in readiness to protect those at work, should the garrison sally out. During the night this trench and bank are made of sufficient depth and extent to cover from the missiles of the place the number of men requisite to cope with the garrison, and the besiegers remain in the trench during the following day, in despite of the fire or sorties of the besieged. This trench is afterwards widened and deepened, and the bank of earth raised, forming a covered road, called a parallel, which embraces all the fortifications to be attacked; and along this road, guns, wagons, and men securely and conveniently move, sheltered from the view and the missiles of the garrison. Batteries of guns and mortars are then constructed on the side of the road, to oppose the guns of the place, and in a short time, by superiority of fire, principally arising from situation, silence all those guns which bear on the works of the attack. After this ascendency is attained, the same species of covered road is, by certain rules of art, carried forward, till it passes over all the exterior defences of the place, and touches the main rampart wall at a spot where it has been previously beaten down by the fire of the batteries erected expressly for the purpose in the more advanced parts of the road.
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> "The besiegers' troops, being thus enabled to march in perfect security to the opening in the walls of the place, assault it in strong columns, and, being much more numerous than the garrison defending the breach, soon overcome them, the more easily as they are assisted by a fire of artillery and musketry directed on the garrison from portions of the road only a few yards from the breach,—which fire can at that distance be maintained, without injury to the assailants, on the defenders of the breach until the very instant of personal contention. The first breach being carried, should the garrison have inner works, the covered road is by similar rules of art pushed forward through the opening, and advanced batteries are erected in it to overpower the remaining guns of the place; which effected, the road is again pushed forward, and the troops march in security to the assault of breaches made in a similar manner in those interior works, and invariably carry them with little loss. But as it is always an object to preserve the life of even a single soldier, so when time is abundant, the loss of men attendant on the assault of breaches under these favorable circumstances may be avoided, by pushing up the covered road through the breach, without giving the assault, and thus, by art and labor, the strongest defences frequently fall without any exertion of open force."

From this description it must be obvious that the most important object at a siege is to carry forward the covered road to the walls of the place, that all the other operations are secondary to and in furtherance of such an advance, and that hence the efficiency of armies at sieges depends upon their ability to complete the road at a small expense of life. But as this covered road advances, the difficulty increases. At its commencement, the work, being many hundred yards from the fortifications, can be performed by the common soldiers. But when the road or trench has arrived within a fair range of musketry from the place, then particular precautions are required; yet the work at this stage is not so difficult as to prevent its being executed by soldiers who have had a little previous training. At the last stage, when the approaches have been pushed close to the place, when to be seen is to be killed, when mine after mine blows up the head of the road, with the officers and men on the spot, when the space becomes so confined that little or no front of defence can be obtained, and when the enemy's grenadiers sally forth every moment to attack and deal out destruction to the workmen,—then the work becomes truly hazardous, and can only be performed by selected brave men, called sappers, who have acquired the difficult and dangerous art from which they derive their name. An indispensable auxiliary to the sapper is the miner, who in the exercise of his art requires even greater skill, conduct, and courage. The duty of a miner at a siege is to accompany the sapper, to listen for and discover the enemy's miner at work, and to prevent his blowing up the head of the road, either by sinking a shaft down to and meeting him, in which case a subterranean conflict ensues, or by running a gallery close to that of his opponent, and forcing him to desist from working by means of suffocating compositions, and by various arts the knowledge of which he has acquired from experience. Without the aid of skilful miners, sappers would be unable to execute that part of the covered road forming the descent into the ditch, not to mention other operations in the progress of which the assistance of the miner is equally indispensable; and without their joint labors and steady co-operation, no besiegers' approaches would ever reach the walls of a fortress. In the British service they are blended into one honorable body, the Royal Engineers.

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[1] *Journals of Sieges in Spain*, by Colonel Sir John T. Jones; Preliminary Observations on the Attack of Fortresses.

But a siege, though it calls for personal bravery, unremitting exertion, and extraordinary labor in all employed, if scientifically prosecuted, is certain in its progress and its result. More or less skill and exertion in the contending parties may prolong or abridge its duration; but the sapper and the miner, when skilfully directed and adequately supported, will ultimately surmount every obstacle. On the other hand, sieges undertaken by armies imperfectly supplied with these auxiliaries are hazardous in the extreme. The only chance of success consists in scrutinizing the exterior of the fortress, in order to discover some spot whence, from the irregularity of the ground, or fault of construction, the main escarp wall may be seen at a distance sufficiently great to enable the ordinary working parties to approach with the covered road, and there to establish batteries for breaching or forming an opening through it into the place. When this is effected, the troops advance to the assault of the breach, as in the 16th century, thus passing from the shelter of the covered road into the fire of the place at the moment when it becomes most powerful and destructive; and as the fire of the besiegers' distant batteries is necessarily suspended during the assault, lest it should destroy the storming party, the garrison can with impunity mount the ramparts and employ every kind of weapon, missile, and instrument in their defence. All the chances are thus in favor of the besieged; for should the columns of attack, under these disadvantages, arrive in good order at the brink of the ditch, they must descend into it down a wall from 14 to 16 feet in depth, which cannot fail to break their order and throw them into confusion; and as no new formation can be attempted in a spot where death meets them in every shape, the assailants rush to the breach more like a rabble than a solid column. From this moment success hinges on the individual bravery of the officers and men, and the unshrinking firmness of the general commanding, in encouraging and supporting their efforts. But although these qualities, when united in a high degree, may, at a great sacrifice of life, enable the assailants to overcome all resistance, yet an assault of this nature, under ordinary circumstances, has almost always proved unsuccessful. Indeed, it may be laid down as the result of experience that, should an army unprovided with sappers and miners, and with the materials and means to render their services efficient, be opposed to a place fortified according to the modern system, with its walls completely covered, all the usual methods to reduce it would prove unavailing; no period of time nor sacrifice of men would be sufficient to purchase success, and the prudent course would be to decline an attempt pregnant with hazard, perhaps ruin.

> "These considerations," says Sir John Jones, to whom we are indebted for the above account of the various modes of attacking fortified places, "have for many years had their due weight with the great powers of Europe, and have induced them to form and keep up, as integral portions of their military strength, every necessary auxiliary for the reduction of fortresses; and sieges have in consequence become certain and comparatively bloodless. But England, constitutionally jealous of permanent military establishments, has always discountenanced military organization and military preparation till the hour of need, and with respect to sieges, which are rare, and exclusively offensive operations, has even carried her jealous feelings beyond the bounds of rational prudence; for, possessing a corps of officers professionally educated and well grounded in the science of attack and defence, she has denied them every requisite establishment to render their acquirements availing, and has most unreasonably expected her armies to reduce the skilfully fortified and well-governed places of the 19th century with means inferior to those used against the exposed and ill-constructed places of the 16th and 17th centuries."

And what was the immediate consequence of this irrational jealousy and niggardly parsimony? Contrary to all ordinary calculation, the fortresses garrisoned by the French in Spain were reduced; but at what a prodigious expenditure of life was this effected! In the several attacks upon Badajoz, two of which from extrinsic circumstances proved abortive, a little army was sacrificed; as many men, in short, as would have been sufficient for ten sieges undertaken with adequate means, and conducted according to the ordinary rules of science. But this is not to be understood as involving any reflection on the military talents of the general or the professional ability of the engineers. General Foy, in his work on the war in the Peninsula, has indeed made such a charge, condemning the mode of attacking fortresses adopted by the British in Spain as unskilful and inefficacious, and bringing it forward as indisputable proof of the low state of their military knowledge. But it should be recollected that the adoption of this mode was not a matter of choice, but of necessity, and that, if it was in its nature rash, hazardous, and inefficient, the fact of its having been directed against Ciudad Rodrigo and Badajoz with such rapidity of development and certainty of result as to outstrip the calculations of the French marshals, deceive the vigilance of French governors, paralyze the science of the French engineers, and baffle every defensive effort of the French garrisons, is surely no evidence of deficiency in military talent and professional skill. The objections to this mode of attack are insurmountable and decisive; that it succeeded in the instances referred to is merely a proof of what British soldiers, even when acting under the greatest disadvantages, are capable of accomplishing. These remarks are, however, no longer applicable. Since the Crimean war great attention has been bestowed upon the education and training of sappers and miners, and though England has neither the numbers of men nor the quantities of stores possessed by Continental nations, yet what she has of each is of the best. Every advance in science, if applicable, has been at once adopted into the military service; and as our civil engineers are as a body admittedly without superiors in the civil world, it may be confidently stated that in the military world our military engineers hold no inferior position.

Having thus given a general description of the methods of attack, we shall now subjoin, on high authority, a view of what is considered necessary for the proper defence of fortified places. An order issued by the French minister of war in 1813 contains directions on the subject which are almost universally applicable, and therefore deserve a place here. Every commander is directed to consider his garrison as liable to be unexpectedly attacked, and to pass at once from a state of peace into a state of war or siege, either by rebellion, by unlawful assemblies, by the presence of an enemy, by surprise, or by sudden assault,—in a word, by unforeseen causes, of which the history of war offers numerous examples. He is therefore ordered, even in time of peace, to fix his plan and arrangement for defence, according to such supposed attacks as may appear most probable, and to determine, for the principal cases which may be likely to occur, the necessary posts, reserves, and movements of the troops, and to take measures to ensure the due and active co-operation of every corps of the garrison. He ought, particularly, to make himself thoroughly acquainted with (1) the ground beyond the place which may be within the circle of action, of investment, and of attack; (2) the fortifications of the place, its interior, its buildings, its military edifices or establishments; (3) the garrison, the means of the place in artillery, in ammunition, and in other stores of every kind; (4) the population to be maintained in time of siege, the men capable of bearing arms, the master and journeyman artificers fit to be employed either on the works or in case of fire; and (5) the provisions, materials, tools, and other resources which the town itself and surrounding country can furnish, and which it might be necessary to secure in case of siege. In order to enable governors and commanders to comply with these instructions, which are clear and precise, the minister proceeds to detail their principal duties, according to the circumstances in which they may find themselves placed; but for these we must refer to the general order itself, which is a masterpiece of its kind, and in all probability emanated directly from Napoleon himself. Its object appears to have been to inspire a governor with hopes that, by taking proper precautions, and making a full use of means previously provided, the defence might be rendered equal, if not superior to the attack; and whether this be so or not, the importance of the directions embodied in the order is not diminished, and where they are duly observed the nature and extent of the resistance must be materially increased.

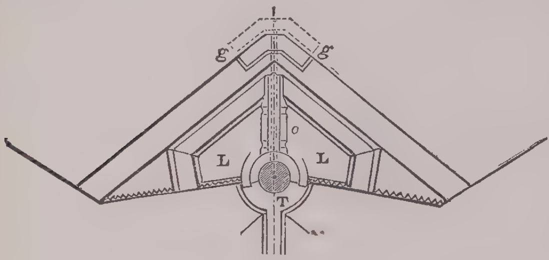


Fig. 67.—Lunette of Darçon.

The protracted and ablé defence of Sebastopol led many to imagine that the Russians by new defensive arrangements had solved the problem so long under discussion, and had again restored to the defence much of its former superiority over the attack. But the real merits of the Russian engineers consisted not in the discovery of new principles, but in the skilful application of those principles which, recognized at an early period, have been by degrees matured and enlarged. In estimating the comparative results of the attack and defence of Sebastopol, it must be remembered that neither can be judged by strict rules, as neither conformed to such rules. The north side being left open by the impossibility of investing both sides, the south became a detached line of powerful intrenchments, to the defence of which the whole force of an army, not a garrison, could be directed at will. The strength of the garrison, continually renewed from without, permitted the fullest use of detached works, which, when backed by a line in rear sufficiently strong to resist a *coup-de-main*, constitute one of the most powerful modes of defence. Such a fort or work was the celebrated Malakoff Tower, and the redoubt enveloping it, the type of which may be found in the lunette of Darçon, of which fig. 67 is a plan. In this lunette, intended to be prepared beforehand, T is a powerful tower, LL a lunette, which in this case is revetted, but might have been made, as at the Malakoff, a simple earth-work—*c* an underground communication to *g*, *g*, loopholed galleries for flanking the ditches. This sketch will show the general principle of defence involved in such works, but of course the form must vary in the hands of an able engineer, to suit the peculiarities of the ground. At the Malakoff the redoubt was made circular, but in principle it was strictly analogous to the lunette.

Siege of the Citadel of Antwerp.

Plate XI. We shall now, as an example give a sketch (abridged from the *United Service Journal*) of the attack on the citadel of Antwerp in 1832—first, because this was the most regular and scientific siege which had taken place for many years; and secondly, because as a practical operation an account of it must be more interesting and more instructive than any description of the formal theoretical plans which are usually drawn in the military schools. See Plate XI.

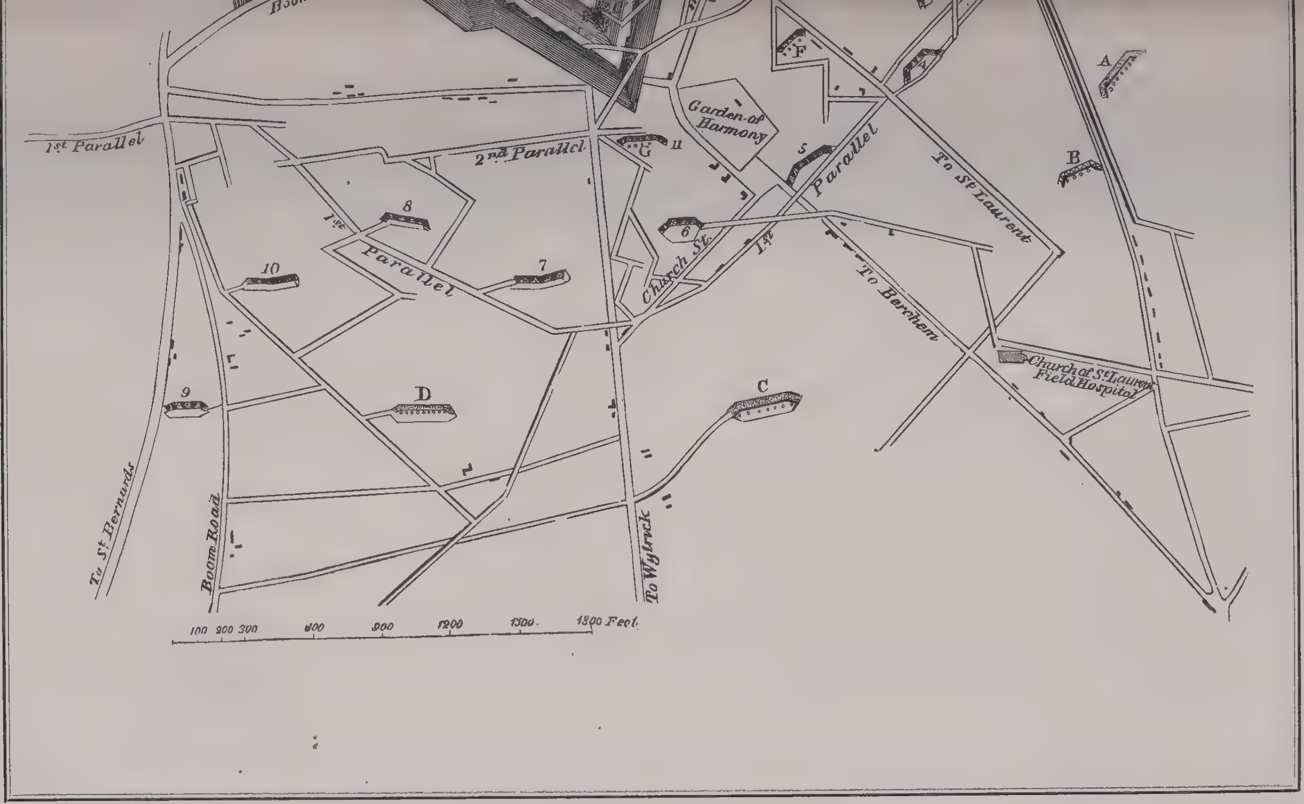
Without entering into any detail of the complicated circumstances out of which the siege arose, in a time of general peace, it may be stated here that Great Britain and France, as joint guarantors of the integrity and independence of Belgium, having failed to procure the evacuation of Antwerp by means of negotiation, were obliged to have recourse to force. Hence the siege is to be viewed as an ejectment executed against the king of Holland, who had refused to renounce possession, unless compelled to do so.

The French army employed to cover and conduct the attack of the citadel of Antwerp in November and December, 1832, was placed under the command of Marshal Gerard, and amounted to 66,450 men, viz.:—54,000 infantry, 6000 cavalry, and 6450 engineers, artillery, and pontonniers, with 14,300 horses, and 144 pieces of siege and 78 of field artillery. On the 24th of November Marshal Gerard established his headquarters at the village of Berchem, about 2500 yards from the citadel, and issued orders to commence operations in the evening as soon as it became dark. The garrison of the citadel, under General Baron Chassé, amounted to 4470 men, with 144 pieces of ordnance of all calibres, and abundance of ammunition and stores. It will be observed that a garrison of about 5000 men was opposed to the attack of a besieging army thirteen times its strength.

At eight o'clock p. m. on the 29th November, the French troops destined for this service, consisting of 18 battalions, 900 artillery, and 400 sappers, in all about 17,140 men, assembled at the dépôts of intrenching tools. The flank companies of these brigades, supported by twelve eight-pounders and a strong piquet of cavalry, formed the covering party under the direction of General Haxo, by whom and the officers of his department (the engineers) the first parallel and approaches were traced out, whilst General Nïègre and the officers of artillery marked the sites of the projected batteries. The first parallel leaned on the covered-way of the right face of Montebello, and extended towards Kiel, its nearest point being about 325, and its farthest 435 yards from the advanced front of the citadel. The extent of the first parallel was 1870 yards, and that of the approaches 3750 yards. The communications from the right and centre debouched from the Malines Chaussée, in the village of Berchem, parallel to the road leading from that village to the Harmony and St. Laurent; the communication from the left commenced near the garden called Heinrich's; whilst a fourth, on the extreme right, sprung from the covered-way of the left flank of Montebello, opposite to the first traverse.

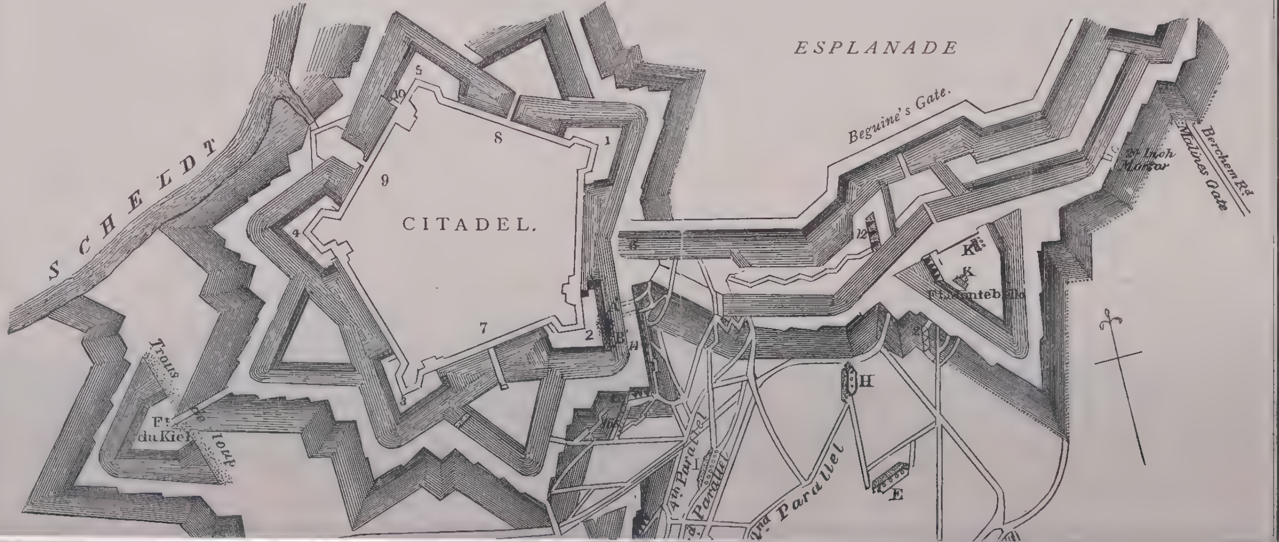
On the second night, from 30th November to 1st December, five approaches were pushed on in front of the first parallel,—two in the direction of the capital of the Toledo bastion, two upon that of the Lunette St. Laurent, and one, being the fifth, terminating in a place of arms on the extreme left. From the 1st to the 2d December two zig-zags were added to the approaches,—one from the centre, in the direction of the gorge of St. Laurent, and the other on the right, diverging towards the curtain, between the Toledo and Fernando bastions. The badness of the weather sadly incommoded the workmen, and prevented the artillery getting the guns into battery. Between the 2d and 3d December four zig-zags were made in front of the approaches on the right and centre, and half a parallel was formed to complete the place of arms constructed on the left during the night of the 30th November. The heads of the zig-zags were advanced to within 135 yards of the glacis. The batteries Nos. 1, 2, 3, 4, 5, 6, and 9 (see Plate XI.), with two for mortars in the rear, were armed, and ready to be unmasked at a moment's notice. The arming of Nos. 7, 8, and 10, on the extreme left, was impeded by the difficulties of the ground. From the 3d to the 4th December, the second parallel was traced and commenced, its right leaning on the foot of the glacis of the counterguard, its centre and right 130 yards distant from the place of arms in the covered-way of the Toledo bastion, and its left towards the right of the covered-way of the St. Laurent, at 90 yards from the crest, and 15 from the foot of its glacis. The length of the second parallel was 1250 yards, and with its approaches from the first parallel it occupied 3025 yards of ground. By the greatest exertions batteries Nos. 7, 8, and 10 were armed during the night. This completed the armament, and, at 11 a. m. on the 4th, the embrasures were unmasked, and the batteries opened their fire from centre to flanks, and maintained it steadily during the day.

From the 4th to the 5th of December an approach was pushed on from the second parallel, directly upon the salient angle of St. Laurent, and an entry was made into the covered-way by a return to the left. The garrison discovered this, and opened a sharp fire from the lunette; a lodgment was, however, effected near the spot usually occupied by the first traverse. At this time the garrison suffered much from the fire of the besiegers. From the 5th to the 6th the lodgment made the previous night in the covered-way of the salient place of arms of St. Laurent was prolonged as far as the first traverse. But the besieged kept up so vigorous a fire that the French engineers were obliged to renounce the flying and adopt the full sap. The zig-zag in the counterguard, being about three feet in width and four in depth, was conducted along the parapet, nearly to the extremity of the right flank, and within 180 yards of the counterscarp of bastions Toledo and Fernando; and two lodgments, blinded with fascines, were made in the parapet for six guns to enfilade the covered-way of the Toledo bastion. In the mean time a steady fire was kept against Kiel, the ravelin in its rear, and the Paciotto bastion. From the 6th to the 7th a battery of 24-pounders near the village of Burcht on the left and Hoboken on the right opened on the gun-boats which flanked the French post at the Melk Huys. It was intended to assault St. Laurent this evening; but as the lunette was found to be


1st Parallel
2nd Parallel
1st Parallel
1st Parallel
Garden of Harmony
Church St.
To St Laurent
To Berchem
Church of St. Lauren[t]
Field Hospital
To St. Bernurds
Boom Road
To Wylrick
A
B
C
D
F
G
5
6
7
8
9
10
11
100 200 300 600 900 1200 1500 1800 Feet

PLAN of ATTACK of the CITADEL of ANTWERP from 29th Nov'r to 23d Dec'r, 1832.

1—*Fernando*
2—*Toledo*
3—*Pacietto*
4—*Duke*
5—*Alba*
6—*Batardeau*
7—*Port de Secours*
8—*Port de la Ville*
9—*Port de l'Escaut*
10—*Gen'l Chasse Casemate*
A'—*Descent into Ditch*
B'—*Breach*
C'—*Descent into Ditch of the Ravelin*



well protected by *trous-de-loup*, the project was abandoned, and the regular method of descent, passage, and mine determined on.

Between the 7th and 8th of December a shell penetrated the blindage of the laboratory, and, setting fire to the combustibles in it, caused considerable havoc. A battery for six mortars, E, on the right, now opened its fire; another, F, also for six mortars, was traced behind the centre of the parallel; and platforms for four mortars were laid near Montebello. The fire of these batteries was directed on the Toledo bastion and the buildings within it. On the previous day jets of flame had been seen to issue from the Great Barracks, and, in spite of every exertion, the building was entirely consumed by the evening of the 8th.

From the 9th to the 10th of December the operations against St. Laurent were renewed with great activity, and the sap advanced to the crotchet of the second traverse, whilst that intended to debouch upon it from its right was likewise pushed on. The third parallel was opened 130 yards in advance of the second, its right debouching beyond the Boom Chaussée, from the branch running into the covered-way of the counterguard, and its left uniting with the boyau parallel to the foot of the glacis of St. Laurent. The garrison suffered much from the vertical fire of the mortars and howitzers, especially the great mortar and the new-model eight-inch howitzers. Until the year 1822 the eight-inch howitzer in common use in France measured 3 feet 6 inches French, and weighed 1096 ℔, or twenty-three times the weight of the loaded projectile, whilst its calibre was equal to a solid shot of 80 ℔, and contained 65 ounces of powder. The new-model howitzer was an improvement on the Russian licorne and the Spanish heavy howitzer, perfected by Colonel Paixhans. The raft for the blinded descent into the ditch was brought up to the lodgment, and a second descent *à ciel couvert* was commenced to the left of the first. The third parallel was improved and widened. A little after dusk on the 10th the besieged made a sortie, which was driven in, but not until damage enough had been done to occupy the French all the night of the 10th and the morning of the 11th in repairing it. From the 11th to the 12th three rafts were got ready, and placed in the descents to the ditch; they were about 12 feet by 8. At dusk the miners returned to the escarp, and, in an excavation made the previous night, fixed two petards, which, by their explosion, produced a fissure in the wall, and a sergeant having immediately entered the hole, commenced a gallery under the centre of one of the arches. At 11 A.M. on the 12th the battery H, on the extreme right of the second parallel, opened fire, which, combined with that from the others, told severely on the Toledo bastion. The miners still continued their work under the lunette St. Laurent, and commenced chambers for three mines. The fourth parallel was widened during the day.

Between the 12th and 13th of December the miners were at work in the chambers under St. Laurent, which were not yet completed. On the right the covered-way of the left face of the Toledo bastion was crowned to within 65 yards. From the 13th to the 14th, after nearly sixteen nights of open trenches, the arrangements for the assault of St. Laurent were completed, and orders were issued to prepare for the storm. Too much value was set on this outwork, defended by little more than a hundred men, one five-and-a-half-inch howitzer, two Coehorn mortars, and a six-pounder. The mines being charged, the blinded descent into the ditch was pierced as soon as it became dark, and everything prepared for the assault. Three storming parties of the flank companies of the 65th regiment of the line were posted in readiness, with a column of reserve; and at 5 A.M. on the 14th the match was applied to the saucissons of the mines. Three successive explosions took place, and the escarp immediately presented a wide and practicable breach. The fascines for crossing the ditch had been injured by the explosions, but after a little delay the storming party entered almost without opposition, and made prisoners one lieutenant and forty-eight rank and file, the others having escaped into the citadel. Thus fell the lunette St. Laurent.

After this operations were carried on against the citadel, and at 11 A.M. of the 21st December the battering in breach commenced, and continued until the 23d. When a practicable breach had been formed, and Marshal Gerard was about to deliver the assault, the garrison surrendered, after a gallant defence, remarkable, however, for its passive rather than for its active character. When Marshal Gerard entered the fortress, General Chassé was found in a casemate in the Alba bastion, which he had occupied during the siege. On their progress from the gate to the governor's quarters, they passed through a scene of desolation and ruin which baffles description; with the exception of the principal powder magazine, two or three service magazines, and the hospital, not a building remained standing. The terrepleins of the bastions were ploughed into deep ruts by the shells; the gorges were encumbered with heaps of fallen rubbish; and though the casemates and subterranean communications were not perforated, all of them had sustained damage from the incessant explosion of shells, and they emitted an almost insupportable odor, caused by the number of men who had been crowded into them. When Count Gerard took his leave of General Chassé, he observed "that it was high time to surrender, that he had gallantly and honorably done his duty, and that he ought not to have held out a day longer." With a fortress reduced to a heap of ruins, a garrison exhausted and attenuated, and a breach sufficiently wide to admit a column formed upon a front of a hundred, it would indeed have been madness to attempt to stand an assault.

The following is a list of the different batteries, with the direction of their fire respectively:—

	No. of Batteries.	24 Pounders.	16 Pounders.	8-inch. Howitzers.	10-inch Mortars.	Distance in Yards.	Direction of Fire.
Opened on the 4th and 5th December.	1	6	..	2	..	535 & 550	Battering the left face of Toledo, and gorge of St. Laurent.
	2	..	2	2	..	500	Ricochetting the left face of Toledo.
	3	4	..	2	..	640	Battering the left face of the Ravelin.
	4	..	3	2	..	650	Ricochetting left face of the Ravelin.
	5	6	2	1	..	680 & 430	Battering right face of Toledo, and ricochetting left of Toledo.
	6	..	2	2	..	700	Ricochetting left face of Toledo.
	7	6	2	1	..	380 & 700	Ricochetting left face of St. Laurent, and battering right face of Paciotto.
	8	..	3	2	..	465	Ricochetting left face of Ravelin
	9	..	..	6	..	820	Battering salient angle of Paciotto.
	10	8	..	..	..	650 & 520	Battering left face of Ravelin, and Lunette of Kiel.
	A	..	..	..	10	850	Not armed.
	B	..	..	..	9	1000	Body of the Citadel.
	C	..	..	..	11	1050	Do.
	D	..	..	..	10	850	Do.
		30	14	20	40		
Between the 8th and 18th.	11	4	..	..	..	500	Battering the right face of Toledo.
	12	..	3	..	..	435	Battering the Batardeau.
	13	...	4	..	..	220 & 275	Battering the left face of Ravelin.
	E	..	..	..	6	500	The body of the Citadel.
	F	..	..	..	6	490	Do.
	G	..	..	..	6	650	Do.
	H	..	..	..	6	380	Do.
	K	..	..	..	8	600	Do.
	14	6	..	..	..	50	Breaching battery.
	15	6	..	..	..	350	Counter-battery against the left flank of Fernando.
	16	..	..	..	..	125	Six pierriers on the Ravelin and Toledo.
	I	..	..	..	10	250	Terreplein and rampart of Toledo.

Out of their force of 66,450 men, the French lost during the siege 108 killed and 695 wounded—total, 803. The Dutch had 4937 men in the garrison, of whom they lost 122 killed, 369 wounded, and 70 missing—total, 561.

A careful comparison of the details of this siege with the general principles which have been enunciated will enable the reader to recognize the importance of the following maxims:—

1. Independently of the great amount of labor to be provided for in the construction of parallels, approaches, and batteries, there will be a daily drain upon the besieger's forces by casualties, so that he can scarcely expect success unless his original preponderance in numbers has been such as to leave him at the final moment of assault in a condition to attack the diminished garrison with an overwhelming force. In addition, therefore, to a covering army when external relief is threatened or anticipated, the besieging army should be from four to five times the strength of the garrison, or even more, should the nature of the ground add to the ordinary difficulties of approach. This superiority of force is necessary to give celerity and steadiness to the operations, which would otherwise be tedious and interrupted.

2. A perfect investment is not merely expedient but indispensable. So long as any portion of the enceinte of a fortress is left open the garrison is able to recruit its strength from without, and it is relieved from that moral depression which must oppress men when closed up within a narrow space, and exposed, day after day, to fatigue and danger. Under such circumstances there seems to be no limit to the power of defence, as fresh supplies of men enable the besieged to add intrenchment to intrenchment, and it is only possible to overcome him by determined, reiterated, and overwhelming assaults. Such were the circumstances of Sebastopol; the system of attack forced upon the allies never enabled them to isolate even the southern section of the fortress, and the means of communication between the south and north remaining available fresh troops were continually brought to the south side, and a superiority in numbers given to the defenders over the attacking force. It ought not therefore to be a matter of surprise that the progress of the siege was slow.

3. Good and secure lines of communication are most essential, as there ought to be no interruption after the ground is broken and the siege has commenced. Neither in the attack nor in the defence should guns be fired idly, or from distances and positions from which their fire would be useless or even uncertain; but when the proper distance has been ascertained, battery should succeed battery as the works of approach advance, and no interval for rest or for the repair of injuries should be allowed to the besiegers.

4. The importance of advanced works was well exemplified at the siege of Antwerp, where the whole force of the attack was directed against the advanced lunette St. Laurent, whilst the

defence, though good, had not the advantage of the collateral defence of the lunette Montebello (see Plate XI.). Where the garrison is an army, such works afford the best means for an obstinate defence, and, by forcing the besieger to act on the circumference of a larger circle, diminish very much his ordinary advantage of concentration.

Siege of Dantzic.

Having thus given an example of an interior and passive defence, we shall now, in further illustration of the principles already laid down, advert to an example of a different kind. The siege of Dantzic, whether considered with reference to the magnitude of the operation, the difficulties to be surmounted by the besiegers, or the active and varied character of the defence, was certainly one of the most memorable events in the campaign of 1807. Before the war of 1806 and 1807 the fortifications had been much neglected, because from the position of the place it was not anticipated that it would have to sustain a siege. But when the battles of Jena and Auerstadt had entailed destruction on the Prussian army, and had laid open the kingdom, General Manstein, who commanded at Dantzic in the absence of Field-marshal Kalkreuth, the titular governor, labored with much activity in repairing the walls and the palisades, and in completing the enceinte. It is necessary, therefore, to describe the principal defences at the time the place was invested by Marshal Lefebvre, at the head of the tenth corps of the grand army, and before the commencement of the trenches on the 1st of April.

The city of Dantzic, traversed by the Mottlau, was surrounded with large ditches filled from that river, the waters of which, retained by several sluices, formed, to the eastward, a vast inundation, which, reaching on one side to the suburbs of Oliva and St. Halbrecht, and on the other to the dykes of the Vistula, extended about four leagues, and covered two thirds of the eastern fronts. On the north the Vistula runs about 260 yards from the covered-way, leaving between the left bank and the glacis of the place an impracticable marsh intersected by canals; at its embouchure, distant nearly three miles, the banks were defended on the right by the fort of Weichselmunde, and on the left by an intrenched camp in the small island of Neufahrwasser, intended to cover and protect the arrival of such succors as might come from the seaward. The ground adjoining the banks of the Vistula being intersected by canals and covered with marshes, was extremely unfavorable to a besieger, as it rendered it difficult for him to form establishments or raise works of proper solidity, and forced him to extend his quarters, disseminate his troops, and multiply his posts. At the period in question this inconvenience was the more severely felt, because the besieging force, though nominally 18,000 strong, was inferior in numbers to that of the garrison, which consisted of 12,000 Prussians and 3 Russian battalions, and it required the most vigilant caution to occupy numerous posts without unduly weakening it. The communication between the place and the fort of Weichselmunde was maintained by a series of redoubts constructed on the borders of the Vistula, and particularly by the advantageous position of the isle of Holm, which continued the defence of the place to the fort with the exception of an interval of about 1400 yards, and renddered the communication with Weichselmunde by the canal of Laack secure in spite of any batteries which the besiegers could establish at Schellmühl. The French, therefore, could not attempt to throw a bridge over this part of the Vistula until they had made themselves masters of the isle of Holm. On the west two chains of hills, separated by the valley of Schidlitz, covered the enceinte; and the prolongations of these hills were crowned by the two forts of Bischopsberg and Hagelsberg, which, being connected by intrenchments, formed a second enceinte, leaning upon one side on the inundation of the Mottlau, and upon the other on the left bank of the Vistula. This new enceinte, though constructed of earth and without revetment, was secure against assault, and as the covered-way as well as the foot of the scarps bristled with strong fraises which served instead of revetments, the besiegers had no hope of succeeding by a *coup-de-main*, and were therefore obliged to proceed by regular attack.

From this description of the defences of Dantzic, it is easy to perceive that the difficulties attending the operation must have been very great. The principal of these, as stated by General Kirgener, who until the arrival of General Chasseloup directed the attack, were, first, that Marshal Lefebvre had at first an army inferior to that of Marshal Kalkreuth, all of those destined for the siege not having then arrived, and that this army was in a great measure composed of new troops; secondly that, owing to the badness of the roads and the inclemency of the season, the artillery experienced the greatest difficulty in bringing up its convoys, the establishment of the batteries was retarded, and a scarcity of ammunition sometimes prevailed; thirdly, that the place, which could not be completely invested because the approach from seaward was in the hands of the British, required an immense circumvallation, which, in fact, could not be completed until after the arrival of reinforcements; the corps of troops which occupied the quarters were extremely weak, and could neither furnish a sufficient number of workmen, nor even the number of men necessary for guarding the trenches; and fourthly, that the besiegers had no good plan of the place, and did not know the depth of the ditches, and as the accidents of ground in front of the fortifications were extremely diversified, they could only be reconnoitred in proportion as the works advanced. These circumstances, joined to the necessity of concentrating the greater part of the troops close to the camp of Neufahrwasser, by which succors arriving by sea might debouch, and the advantage which the besieged had in retaining the mastery of part of the suburbs, determined the chief engineer, after the investment had been effected, to direct the principal attack against the Hagelsberg, and a false one against the Bischopsberg fort. The true point of attack was the long branch of lines in the plain connected with the bastion on the right of the Hagelsberg: "c'était là le défaut de la cuirasse;" but, for the reasons above stated, approaches were directed against the fort itself.

As the details of this great siege would fill a considerable volume, all that our limits permit is merely to indicate the principal occurrences. On the 1st of February, 1807, the troops of General Dombrowski began to approach Dantzic, and took up a position at Mewe, upon the left bank of the Vistula. On the 15th General Menard, commanding the Baden contingent, arrived at the same point, and repulsed a detachment of the garrison of Dantzic, which had advanced from Dirschau to attack him. On the 23d General Dombrowski, having been reinforced, received orders to attack a large detachment of the enemy which occupied an advantageous position at Dirschau and its environs. The combat here was obstinate and sanguinary; but the Prussians, though intrenched in a church and a churchyard, were dislodged and driven back chiefly by the Poles, who, exasperated by their long resistance, put to death without mercy all who fell into their hands. After the combat of Dirschau, General Manstein no longer sought to obstruct the distant approaches. The troops destined to form the besieging army now arrived in succession, and the formation of the park of artillery was commenced. On the 12th of March Marshal Lefebvre found himself in a condition to close in on the place: and the troops of the garrison having withdrawn, he distributed his own in the following positions:—a battalion of French light infantry at Oliva, a Saxon battalion at St. Halbrecht in the Burgerfeld, and two at Tiefensee and Kemlade; the Poles occupied Schonfeld, Kowald, and Zunkendin; some battalions took post at Wonnenberg, Neukau, Schudelkau, and Sniekau; the Saxon cuirassiers and light horse were stationed at St. Halbrecht and Guirsehkens; the 19th regiment of French chasseurs at Burgfeld, and the 23d at Schudelkau; the Baden dragoons and hussars at Wonnenberg, and the Polish lancers at Langenfurt. On the 16th the marshal attacked the village of Stolzenberg, which he carried after a warm resistance, as he did also the suburb of Schidlitz, to which the Prussians had retired; and on the 18th the place was invested, with the exception of the eastern part, which, by the isle of Nehrung, communicated with Königsberg. Field-marshal Kalkreuth now arrived in Dantzic, and assumed the command of the place. The next operation of the besiegers was the attack of the isle of Nehrung, which, after a severe and protracted struggle, was carried in the most gallant manner, and measures were immediately taken to secure the possession of this important conquest. A bridge was also established on the Vistula, and various works constructed to check the attempts of the enemy either on the side of Dantzic or on that of Pillau. At this time the governor, who had under his command a garrison of 18,000 men, besides the burgher militia, made a sortie for the purpose of destroying the works of the besiegers; but the attempt failed, and the Prussian columns were compelled to retreat into the place without having obtained the smallest success upon any point.

It had been decided that the principal attack should be directed against the fort of Hagelsberg (because the redoubt of Bischopsberg was more complete and better flanked by the fire of the place), favored by two false attacks, the one directed against the intrenched camp at Neufahrwasser, and the other against Bischopsberg, and by two secondary attacks on the left bank of the river; and ground was broken on the night of the 1st and 2d April, at the distance of 1600 yards from the palisades. The approaches were pushed forward with the greatest vigor, and on the night of the 11th the second parallel was commenced by flying sap. On the morning of the 12th the batteries were armed. On the 13th the enemy made a sortie in force, attacked the Saxons with great impetuosity, carried a redoubt constructed upon the mamelon of Hagelsberg, and penetrated even to the head of the trenches; but they were ultimately repulsed, though not without difficulty and loss. By the 23d all the batteries of the first and second parallels, and those of Stolzenberg, were armed, and emplacements were provided for field howitzers, from which to throw shells into all quarters of the city. At daybreak on the 23d the batteries were unmasked, and, though the garrison returned the fire with the greatest vivacity, by the 24th the besiegers, firing with 56 heavy guns, had obtained the ascendency, committing great ravages in the place. Being apprised of this circumstance, Marshal Lefebvre summoned the governor, who replied in a manner worthy of himself. The fire of the mortar and reverse batteries continued during the 25th, in the course of which a new battery was constructed between the low flanks of the Stolzenberg, and the direction of some others changed, in order to batter the right bastion of Bischopsberg, the fire of which had greatly incommoded the French batteries. During the day of the 26th the fire on both sides was exceedingly animated; but at seven in the evening, that of the garrison suddenly ceased, and a column of 600 Prussian grenadiers, followed by 200 workmen, sallied out of the place. As the sortie had been foreseen, preparations had been made to repulse it. It was attacked in front and on both flanks; the whole column was either killed or taken prisoners. Meanwhile the works were vigorously pushed forward at all points. The batteries of Stolzenberg were united with the attack on the Bischopsberg; emplacements were prepared for batteries *à ricochet;* at the attack of the lower Vistula the works were continued, and a tongue of land situated at the extremity of the isle of Holm taken possession of and isolated by means of a cut, whilst at the principal attack the greatest exertions were made to prolong the right of the third parallel, and enlarge the communications. On the 30th April the batteries of the besiegers, augmented by several pieces which had arrived from Warsaw, thundered on the place, in different quarters of which conflagrations appeared; and the besieged replied by the fire of all the batteries of the front attacked, directing more than thirty pieces on a redoubt which fired with the greatest effect. But as the fire of the besiegers had made little impression on the exterior fortifications, which were of earth, it was during the first days of May directed chiefly against the palisades, and the utmost activity was at the same time evinced in extending, improving, and urging forward the attack; whilst, on the other hand, the garrison showed equal vigor in obstructing the approaches and destroying the works of the besiegers. In fact, notwithstanding the address of the French artillery, that of the garrison still remained effective, because it had not been possible to ricochet the lines of the fortifications, and the resources of the besieged in munitions of all kinds were more considerable than those of the besiegers.

On the urgent recommendation of General Chasseloup, who had by this time assumed the direction of the attack, it was decided that the isle of Holm should be assaulted, as the possession of it would enable the besiegers to take in reverse the front attacked. The besieged had spared no pains for the preservation of this important post, from a redoubt on which, called Kalke Schauze, they had continually annoyed the left flank of the trenches. In the night of the 6th and 7th of May, however, it was attacked, and carried after a desperate resistance, whilst the possession of it was secured by works added to the intrenchments which had just been stormed, and its batteries were turned against the place. At the principal attack the fire of the besiegers had also mastered that of the besieged; and Marshal Lefebvre was preparing to assault the fort of Hagelsberg, when on the 12th a Russian corps d'armee of 18,000 men, under the command of General Kamenskoi arrived by sea, and disembarked at the intrenched camp of Neufahrwasser.

At the moment of landing his troops, General Kamenskoi was ignorant of the capture of the isle of Holm, and he was disconcerted to find such an obstacle to his communications with the place. This occasioned delay which proved fatal to his enterprise; for had he attacked immediately on landing, it is not improbable that he would have succeeded. It was only on the 15th of May, however, the third day after the disembarkation, that he made an attempt to succor the besieged city. He began to debouch at four in the morning, and, under cover of a brisk cannonade, formed his force, consisting of 12,000 men, in four columns of attack. The onset was impetuous, and at first the Russians gained ground; but they were ultimately repulsed at all points, and forced to retreat with great loss to the intrenched camp. Field-Marshal Kalkreuth made no attempt to second this attack by a general sortie, which would have placed the French between two fires; and by its failure the fate of Dantzic was decided.

The works of the besiegers were now pushed forward with redoubled vigor; and the following day preparations were made for the assault of Hagelsberg. Foreseeing this, Marshal Kalkreuth resolved to make a last effort to destroy the nearest works of the besiegers, and for this purpose ordered a grand sortie, which took place on the evening of the 20th May; but although the Prussians fought with all the fury of despair, they were driven back, and pursued into the ditch of the place. On the 21st the besieging army was reinforced by the arrival of the troops of Marshal Mortier, part of which had remained before Colberg; the marshal himself quickly followed; and orders were immediately issued for the assault of Hagelsberg. Before giving the signal, however, Marshal Lefebvre again summoned the governor of Dantzic, who, having no longer hope of succor, and being convinced that the besiegers were in a condition to make themselves masters of the fort of Hagelsberg, showed a disposition to capitulate. A suspension of arms was accordingly agreed to, and this was followed, on the 24th of May, by a capitulation, the principal conditions of which were similar to those which the field-marshal himself had granted to the garrison of Mayence in 1793.[1]

These two sieges illustrate so well the principles of attack and defence, and are so perfect of their kind, that it has not been thought worth while to add an example of a more recent siege; but it should be observed that in future the preliminary operations of the besieger must take place at far greater distances; he will break ground for his first parallel at not less than twice the distance hitherto laid down, and will place his first batteries in rear of the parallel. This, while entailing on him much greater labor in parallels, trenches, and approaches, offers counterbalancing advantages, as it allows him to disperse his batteries in small units without the sacrifice of any of their power of simultaneous concentration on the point of attack, and with diminished exposure to the counterblows of the enemy's artillery.

BASTIONED SYSTEMS OF THE NETHERLANDS.

The Bastioned System of the Italians was carried into other countries by their engineers, who were extensively engaged in the service of foreign princes, and the celebrated Italian engineer Marchi, coming to Brussels with Margaret of Austria in 1559, appears to have introduced the Bastioned System into the Netherlands. It has been shown that in permanent defences, the ordinary earthen scarp adopted in ditches of field works had been replaced by a masonry revetment as a security against surprise, in consequence of which, in old Italian fortresses, lofty revetments were almost universal; but in a country the soil of which is permeated by water within a few feet of the surface, such a mode of guarding against escalade would have been enormously expensive, and the alternative was adopted of forming broad wet ditches round the ramparts, and by thus securing them from sudden attack, revetment became unnecessary. The first example of a fortress surrounded by simple earthen ramparts without revetments is said to be that of Breda, fortified in 1553 by Count Henry of Nassau, and this arrangement required only to be moulded into the bastioned trace to constitute the ancient system of the Netherlands, as described by Freitag in 1630. Freitag made the flanks of his bastions perpendicular to the curtain, the faces 98 yards long, with a flanked angle not exceeding 90°, and the length of the curtain 149 yards.

Freitag had strange notions respecting his profiles, regulating the height and thickness of his ramparts not so much by the resistance they were required to offer to artillery as by the *number of sides* of his polygon; but disregarding these vagaries of the systematist, the annexed cut (fig. 68) may be assumed to represent the profile usually adopted by the Dutch engineers, R being the body of the place, F the fausse-braye, D the ditch.

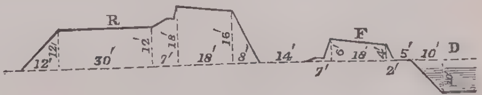


FIG. 68.

It will be observed that the main rampart is surrounded by an advanced parapet called a fausse-braye. This advanced parapet was intended to deliver a grazing fire on the ditch, whilst the space between it and the rampart formed a spacious *chemin des rondes* for the assemblage and movement of troops; but great as these advantages are, the fausse-braye has dropped into disuse. It is not possible to remain in it under a heavy vertical fire, the shells either dropping directly, or rolling down into it from the slope of the rampart above. Such *shell traps*, as they are called, are scrupulously avoided by modern engineers, who know that the improvement of vertical fire will ere long add materially to the difficulties of defence. In the bombardment of Sweaborg, an illustration was afforded of what may be expected of heavy mortars, when the shell becomes a better representative of a mine than it now is. At present a 13-inch shell weighs, when loaded, 200 pounds, and can carry a charge of 11 ℔ of powder, which is ample for breaking the shell and scattering its fragments, but is insufficient for producing the effects of a mine.

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[1] See Dumas, *Précis des Événemens Militaires*, tom. xviii. p. 123.

The Dutch System of Coehorn deserves especial attention, and is represented in Plate IV., fig. 1, which exhibits his first system. The great characteristic in this system is the combination of wet and dry ditches, and the use of covering works, or couvre-faces, intended to preserve the body of the place from injury till an advanced period of the siege. These envelopes were first proposed by Dürer, and it is worthy of note that the remarkable orillon of Coehorn is a reproduction on a modern scale of the complicated casemated structure of one of Dürer's basteien. Coehorn was well acquainted with the principles and the systems of the eminent German engineer Speckle, and adopted them when applicable to his purpose. The profile (fig. 69) may enable the student to appreciate the difference between the dry ditches of Coehorn and the narrow passage afforded by the fausse-braye of the older engineers.

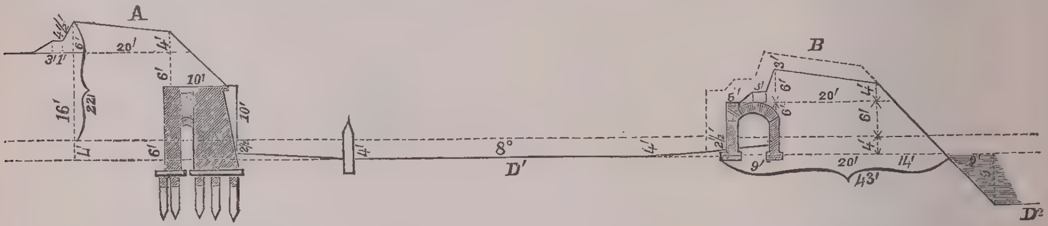

Fig. 69.—Profile of Coehorn's Bastion—A, inner or upper bastion; B, outer or lower bastion; D^1, dry ditch between the two; D^2, wet ditch.

The profile exhibits also the loopholed galleries of the counterscarp, by which a reverse musketry fire is directed on the revetted escarp of the inner rampart,—a system of defence which has since been generally adopted, and is most valuable when a secure communication can be kept up between the galleries and the work which they are intended to defend. After the great siege of Corfu by the Turks, and its successful defence by Schullemburg, some Dutch engineers who had been invited to Corfu by him, and had taken part in the defence, were employed in adding detached forts to the old Italian bastioned fronts. In these works the ruins of numerous examples of loopholed galleries and loopholed traverses may be observed; and they demonstrate that though Coehorn adapted in his writings his reliefs to the aquatic sites of Holland, he developed principles of defence which were equally applicable to other sites and other countries. It has been argued by Bousmard and others that an opening would be formed by shells through the couvre-face, and that the flanks of the bastions would be thereby exposed to the fire of the counter-batteries on the glacis; but it remains to be proved whether such an opening through an earthen mass could really be effected by the horizontal fire of shells; and the French translator of Zastrow, M. Neuens, captain of artillery, justly remarks that, "if shells fired horizontally into earthen works are so efficacious in destroying them, such shells must be a still more powerful instrument in the hands of the defenders for destroying the besiegers' batteries." Zastrow observes that, if we admit with Coehorn and others that, though the besieger may succeed in destroying a few feet of the parapet of the lower or outer face of the bastion, he would in vain, by firing shells horizontally into its mass, endeavor to lay open the counterscarp galleries, it must be admitted that he would, on mounting the low face, find himself in a most critical position, as all the defences, both direct and reverse, of the dry ditch, would remain uninjured, and be in full action against him. These dry or inner ditches, which facilitate the war of sorties, and the reverse or counterscarp galleries, are defensive arrangements of great merit, and may, by modification of profile, be adapted to any site; though the advantage dry ditches offer in such countries as Holland, where the besiegers cannot excavate in them without coming to water, cannot be expected in other sites, and must be made up for by stone pavements, or other contrivances likely to embarrass the besieger in his excavation. Coehorn assumes the plane of site to be 4 feet above the level of the water, and the dry ditch of his bastion is at its centre on the level of the water, so that a passage by sap becomes impossible, as the spade sinks at once into water; but near the escarp and counterscarp the ditches are 2½ feet below the plane of site, sloping on each side towards the central portion. The breadth of the dry ditch of the bastion is 98 feet, and that of the wet ditch before the salient 148 feet. All the slopes are at an angle of 45°. The whole breadth or thickness of the couvre-face, measured at the water level, is 52 feet, so as not to afford space for the besiegers' batteries, and its relief of construction only 12¼ feet. In the ravelin the relief of the low face is 10 feet, of the high face 18½ feet, and the height of its revetment 8 feet; in this work also the thickness of the low face would not afford space for batteries. The width of the dry ditch is the same as that of the bastion. These few details, with an examination of Plate IV., and of woodcut 69, will enable the student to comprehend the general principles of this great engineer; and it is rather by tracing out the ideas of a master mind, as exhibited in the *peculiarities* of his plans, than by studying the plans themselves as wholes, that the engineer will acquire practical knowledge which will enable him to vary his own projects, so that they may really be the best suited for the ground he is working upon.

Coehorn never restricted himself to the rules even of his own system. In fortifying Gröningen he was required to construct works on an eminence which commanded the town, and he adopted a trace towards the exterior of tenailles, the gorges of which were closed by small bastioned fronts constructed by walls which should be easily breached from the main works when the enemy had succeeded in gaining possession of any one of the intervening redans. By this curious combination of the tenaille and bastioned systems, Coehorn gave an undoubted proof of his superiority to the narrow prejudices which often prevent the adoption of the system best suited for the place.

METHODS OF BOUSMARD, CARNOT, CHASSELOUP, DUFOUR, NOIZET, HAXO, AND CHOUMARA.

It would be wrong to dismiss the subject of Bastioned Systems without at least some more reference to the works of these distinguished engineers than has been given in tracing the history of this subject. Bousmard makes the faces of his bastions as well as their flanks curvilinear, the former convex, and the latter concave outwards; but though by this arrangement the effect of ricochet fire may be diminished, the difficulty of defending the salient from the flanks is much increased. His great innovation, however, consisted in placing the ravelin and its redoubt in *advance* of the glacis of the body of the place, and forming in front of them a second or advanced covered-way, the object being to close the main ditch entirely, so that the besiegers' batteries should not be able to fire upon the body of the place through the ditch of the ravelin. The covered-way is made *en crémaillère*, and at each bend there is a sort of redoubt, or casemated traverse, not a simple hollow traverse loopholed, such as those in the detached works of Corfu. It has been objected to Bousmard's system that his advanced works would be speedily taken by turning the gorges both of the ravelin and its redoubt, but it should be remembered that the interior slope of both is replaced by a loopholed wall, being the front of an arched gallery running all round, so that the enemy could not remain within these works exposed to the fire from the galleries, as well as from the body of the place. Without advocating the precise form and disposition of the works recommended by Bousmard, it may be reasonably asserted that in every case of a powerful and well-appointed garrison, the defence will gain by assuming an active character beyond the precincts of the glacis.

As already observed, an unmerited indifference has been manifested by many engineers to the merits of Carnot, principally, it may be believed, from his exaggerated estimate of the effects of a vertical fire of small projectiles. Although he appealed to imagination rather than to calculation, when he assumed that by substituting 600 wrought iron balls, weighing each ¼ ℔, for the one shell of 150 ℔, with 6 mortars projecting 3600 balls, he might expect to put *hors de combat* 20 men at each discharge, or 2000 in 100 discharges, he was right in urging the importance of vertical fire. Carnot constructed his escarp without a revetment, but placed a detached loopholed wall in front of it with a chemin des rondes between, which is one essential feature of his system, the wall being constructed with arched niches in rear so as to shelter the men defending it; the loopholes are in two rows. He provided arched casemates for mortars on the gorge of his bastion in order to fire upon the capital, and the loopholed wall of an inner curtain, being continued along the retired flanks and in front of these mortar casemates, formed a complete inner retrenchment. Between the tenaille and the ravelin was an earthen cavalier, occupying the position of a redoubt in the ravelin, before the bastion's counterguard, so that the whole of the interior works were masked by these earthen envelopes. There is much ingenuity in these arrangements, and at least as full an appreciation of the value of earthen works as can be found in the writings of any modern writer. Carnot's leading principle, however, was, that a successful defence must depend on the active operations of the garrison, and that sorties therefore should be frequent and determined as soon as the enemy had approached close to the fortress. For this purpose he removed the revetment from the counterscarp, and formed it into an easy or countersloping glacis, to admit of the ready advance of the troops from the ditch upon the head of the besiegers' sap. He supposed that the overwhelming vertical fire of the 10 mortars in the mortar batteries in the gorges of his bastions would prevent the enemy from accumulating large covering parties in the trenches, and that he should therefore be able to fall upon the working parties and successfully delay the progress of the works. It has been shown that Carnot entertained an exaggerated view of the effects of vertical fire, but the idea of securing his mortars in casemated buildings is good, and has been adopted in the citadel of Ghent, and in several English works at Portsmouth and Plymouth; and it is impossible to study his works without profit.

Chasseloup (1754–1835), like Bousmard, placed his ravelin in advance of the glacis, and provided it with a small casemated keep, the flanks of which are pierced for two guns each. The tenaille is also provided with casemated flanks, and in front of it is a casemated redoubt or bastionette to supply the place of the ordinary ravelin, and to flank the salient portion of the face of the bastion, the general face being by him bent into two, so as to place the salient portion in line with the exterior side of the polygon, and thereby secure it from the ricochet fire. Casemated redoubts in the re-entering and salient places of arms, a defensive barrack, and a permanent entrenchment on the bastion are also included in his arrangements. De Sellon (*Mémorial de L'Ingénieur Militaire*) observes, "It would indeed be well to force the besieger to pass through two sieges, if the outworks pushed so far forward had higher scarps, and were not so easily turned at the gorge, but as the scarp is only 13 feet high, this possibility of attacking the works by the gorge without a previous descent into the ditch presents such serious inconveniences that it is surprising to observe that Bousmard and Chasseloup should have adopted so defective an arrangement." But notwithstanding this strong condemnation, it is at least doubtful whether such works are not the most suitable for a vigorous defence by a strong garrison, as they would enable the besieged to fall upon the assailants at the most critical moment of their attack with a powerful force; and it may be added that a skilful engineer would know how to throw many difficulties in the way of turning these advanced works, whilst the continance of the besiegers in them might be rendered both difficult and dangerous in the extreme.

The most remarkable feature in Dufour's modification of the modern system is, that one face of the redoubt in the re-entering place of arms is carried across the ditch, and connected with the coupure of the ravelin, so as completely to close the ditch and cover the face of the bastion from the fire of a battery on the glacis of the salient of the ravelin. Dufour also raised the salient of the ravelin into a high cavalier, so as to secure the faces from ricochet; and he proposed that the cavalier should be formed of gravel or small stones, so that the fire from the body of the place might, by scattering about these natural missiles, cause great damage to the enemy, when attempting to form a lodgment.

General Noizet has been already mentioned in connection with the Modern System, his modification of which is now the normal system adopted at the French military schools. Rejecting Dufour's mode of closing the ditch of the ravelin by carrying across it one face of the redoubt of the re-entering place of arms, he effected the same object by placing a massive mask between the coupure of the ravelin and the re-entering place of arms, from the inner escarp of which it is separated by a passage. The counterscarp of the bastion is carried continuously along the inner edge of the mask, whilst in front of it is a ditch which separates it from a demi-caponnière forming its counterscarp and covered-way, and a glacis sloping down the ravelin, of the ditch. The mask, the lunette redoubt in the ravelin, and the redoubt in the re-entering place of arms form a combined series of works of great efficiency for defence, which completely cover all but the salient portion of the face of the bastion. The flank of the bastion, as before observed, forms an angle of 80° with the line of defence, and the advantage taken of this in the citadel of Ghent in forming a most powerful intrenchment in the bastion, with a curtain as long as that of the main front, has also been pointed out.

General Haxo, one of the ablest engineers of modern times, did not publish his scheme of defence, nor did he reproduce it as a whole in the works he constructed, doubtless considering, as has been so frequently urged, that systems, so called, can only be looked upon as the exhibition of great principles, not as rigid rules for their application. His ravelin is made very prominent, and the salient is formed into a traverse, or mask, casemated and armed with artillery. Within the ravelin there is a redoubt, and within that a casemated caponnière or bastionette. The ditch of the ravelin is closed by continuing the counterscarp across it with a glacis slope into the ravelin ditch, and by this arrangement the ditch of the redoubt in the ravelin is also closed. The counterguards, the higher and the lower bastions, form almost three lines of defence, of which two, the outer and inner, are powerfully armed with artillery. The peculiar characteristic of the system is, that the parapet is thrown back, and made in its trace independent of the escarp, so that, whilst the latter retains the usual straight line, the parapet is broken into several portions not in the same line, and thus secured from the effects of ricochet—an arrangement of very great merit, and largely adopted in the Polygonal system. Haxo is probably better known to English engineers as the inventor of casemated batteries *à l'Haxo* than from his merits as an engineer, great as they were. These batteries are formed *in* the parapet, and though arched over with masonry, are covered with earth. They are open in the rear to the terreplein, and the openings in front for the guns are continued into embrasures formed in an extension of the parapet at these points beyond its ordinary retired position in Haxo's system. These batteries are thus secured from the effects of the enemy's fire, and when the embrasures are masked are equally hidden from his view, so that they may at any moment suddenly open a powerful and unexpected fire upon the besiegers. Being open in the rear, and connected together by arched openings between every pair, the circulation of air is sufficient to do away with the inconvenience from smoke, so generally complained of in casemated batteries. The batteries *à l'Haxo* have been used at Grenoble and Lyons, in the forts of Loyasse and Sainte-Foy, and in many English works. Their value has been much diminished by the range, penetration, and accuracy of modern rifled artillery.

The work of the commandant of engineers, M. Choumara, entitled *Mémoires sur la Fortification*, was published in 1847. In this treatise he maintains the principle that the direction of the parapet should be independent of that of the escarp, the latter being formed in straight lines, and considered permanent during the siege, whilst the former may be broken into several lines, and may be modified during the siege so as to facilitate the defence in any direction. Haxo had in his lessons or studies pointed out the importance of this principle, but Choumara was the first to advocate it in print. The castle of Naples exhibits an early example of the reverse operation, a new escarp having been built in front of the ancient round tower forts, so as to change them at the *base only* into bastions, whilst the upper portion of the towers became retired and independent parapets. Choumara, not relying on the bent trace of his retired parapet as a security from ricochet, proposed a traverse on the capital of his bastion, placed outside of the retired parapet, and 33 yards in length. This traverse, made 26 feet high and 78 feet wide at its base, would occupy less than two-thirds of the space of the twelve ordinary traverses required to secure from enfilade the faces of Choumara's bastions 164 yards in length, whilst it would cover not only the bastions but the flanks also. In addition to the traverse or mask on the capital, Choumara proposed high traverses, parallel to the flanks, at about 22 yards from the salients, which would not only secure the faces from enfilade, but would form secure or interior flanks, as cavalier flanks, commanding and firing over those in front. By making the cavalier flanks 98 yards long, and casemating them *à l'Haxo*, 15 guns might be placed in each, and the covered-way of the bastion attacked would be commanded by 30 guns in addition to those of the ordinary flanks, whilst the traverse of the capital would secure the flank cavaliers from ricochet. The last and most remarkable suggestion of Choumara is the proposal to widen his ditch to about 50 yards, and leaving a passage of communication of 16 yards round the base of the escarp, to form an interior glacis, sloping up from the base of the counterscarp towards the summit of the escarp, and having a base of 34 yards wide, thus constituting a continuous mask round the escarp. In respect to countermines, Choumara proposed to replace the great galleries, which are usually made 6 feet high and 3 feet wide, and which are the great arteries of a system of mines, by large vaulted galleries from 16 to 20 feet wide, pierced through the counterscarp, and continued as far as the third parallel. Six of these galleries were to be formed in each front, being placed about 55 yards apart, and connected together by minor transverse galleries or branches. Galleries of this magnitude would, in time of peace, be useful as stores, and in time of war would greatly facilitate the operations of the miner.

The details of military mining cannot be discussed here; but it may be stated that this subterranean warfare requires great skill on the part of both besieged and besieger. The besieged has the advantage of having had the main galleries of his countermines formed beforehand, but in spite of this a war of mines must generally be in favor of a besieger, since every explosion of the mines of the besieged, however destructive it may prove to the assailants, must destroy some portion of the works of defence, whilst every explosion of the besieger's mines must operate upon his enemy only. Starting, however, upon the assumption that a fortress, except in situations which render regular attack impossible, must ultimately fall, the real object of defence is to occupy the enemy for at least the time for which the fortress was designed to resist; and the destruction of the lodgment or of the battery of a besieger may materially protract the resistance of the intrenchment formed in a bastion, and thus enable the besieger to maintain his ground the longer.

The most simple form of mine, and that which may be most readily applied as an obstacle in the way of the assailant, is the fougasse. It consists of a chamber placed at the bottom of a pit about 12 feet deep. The charge is placed in a wooden box, and both the charge and size of the box may be thus estimated. When the line of least resistance, or shortest line drawn from the centre of the charge to the surface of the earth, which in this case is the depth of the pit, is 10 feet, a charge of 100 ℔ will produce an *entonnoir* or excavation, the radius of which is equal to the line of least resistance; and it has been ascertained that the volume of the excavation varies with the charge, the line of resistance and the resisting medium being the same, and that the volume varies also as the cubes of the lines of least resistance; hence, therefore, if W represent the weight of the charge, B the bulk of the *entonnoir* corresponding to 100 ℔ of powder and a line of resistance equal to 10 feet, and b that of the entonnoir corresponding to the charge W and the line of least resistance R, we have $100 : W :: B : b$; but as $B : b :: 10^3 : R^3$, we have $100 : W :: 10^3 : R^3$, and $W = \frac{1}{10} R^3$. Now let S = side of cubical box to contain the charge (55 ℔ of powder thrown loosely in, filling one cubic foot), and $S = \sqrt[3]{\frac{R^3}{10 \times 55}} = 0{\cdot}122\ R$, or nearly $\frac{1}{8}$ R in feet. The pits for fougasses vary generally from 8 to 12 feet in depth, and from 3 to 4 feet in width, being made square, and are revetted with planks when the earth is not firm enough to stand without support; and for this latter purpose gabions may be used of different diameters, so that the smaller may be slipped, through the larger, which have been previously fixed. The box for the powder is well tarred, and when intended to be left in the ground for some time, it should be covered with tarred canvas and put into another box, also tarred both inside and outside. The charge is ignited by Bickford's fuze, or by a saucisson or linen tube about an inch in diameter, filled with powder, and enclosed in a wooden case well tarred. The saucisson and its covering should be laid in a trench, sunk some feet in the earth, from the charge and pit to the place of ignition, in order to secure it from accidents as well as from the enemy's observation (see fig. 26, page 378, in which is also represented the mode whereby the fire is applied by what may be called the fire-box, the end of the trough and powder-hose being introduced into it). As for the thorough fulfilment of the object of a military mine the explosion should be "immediate," it is requisite to employ a contrivance for producing instantaneous ignition. This can be most readily and perfectly effected by employing electricity, and this is now as a rule employed in regular mining operations.

Experience has shown how little real injury the explosion of fougasses does to an assailant; but, as the moral effect of them is a degree of hesitation or irresolution often greater than that produced by musketry fire, and as they are easily extemporized, the fougasse may still be considered an obstacle of some value to the defence. Loaded shells packed in a case may be substituted for the ordinary charge, the case being formed with a horizontal partition, and the fuzes of the shells placed on the lower portion of the case, passing through holes in the partition, so as to be brought into connection with the firing-hose in the upper portion of the case. Another form is the stone fougasse, which is probably the most effectual of all. It is constructed thus. A conical pit is made in the earth about 5 or 6 feet deep, the axis being directed towards the enemy at an angle of 45° with the plane of construction, and at the bottom a charge of 50 ℔ of powder is placed in a well-tarred box. Over the box, and perpendicular to the axis of the cone, is fixed a lid on which as a platform are packed either stones or broken bricks, which, on explosion, are scattered over a space of about 60 by 70 yards. It should be laid down as a rule that facilities for discharging mines ought to be in every fortress, whether electric apparatus be used for the purpose, or openings be prepared in the works through which the powder-hose may be carried.

The last great modification proposed by Choumara is the extension of the exterior side, and the value of this can no longer be matter of doubt, now that the effective range of musketry has so much increased. The length of the line of defence may now be safely and advantageously fixed at between 400 and 600 yards, so that musketry and artillery can co-operate together efficiently. Chasseloup had, indeed, proposed to make his exterior side about 700 yards long, and he was no mere speculative engineer, for he had fortified with great skill Alessandria in Piedmont; but it must be borne in mind that no greater distance should be allowed for musketry than is compatible with distinct vision and a correct appreciation of distance; and further that the men intended to use the rifle in a fortress ought to be well trained for that object. The Gatling gun may in fitting positions be used with effect instead of musketry; it delivers a continuous stream of bullets at the rate of 400 per minute. The value of one Gatling is equal to 22 rifles, and nearly equal to two 9-pounders, and though it has a range of 1200 yards, it produces its best effect at short distances. In the defence of ditches its defect is that it cannot break or overturn scaling ladders.

German System of Defence.

Having traced the history of bastioned defence to the high state of perfection it attained, a summary of other systems will complete the subject. It has been shown that no sooner had the Italians invented the Bastioned System of defence than it found in every country persons who devoted themselves to the improvement of its details,—in France, Errard, Pagan, and Vauban; in the Netherlands, Freitag and Coehorn; and in Germany, Speckle, who was at least equal to any of the others. Germany, however justly it prided itself on Speckle, has gone back to Dürer, and has adopted from him the system of flanking defence, which depends on casemated galleries, and caponnières or casemated works placed across the ditches. Yet, notwithstanding this, it is remarkable that the Germans have taken much of their works from a French officer—the celebrated Marc René, Marquis de Montalembert, who in 1776 published his celebrated work, *Perpendicular Fortification, or an Essay on Several Methods of Fortifying a straight line, a triangle, a square, and all polygons of any number of sides, giving to their defence a perpendicular direction; also, Methods of improving Existing Defences and rendering them much stronger; also, Redoubts, Forts, and Field Intrenchments, of a New Construction*, in 11 quarto volumes, with 165 large plates,—a work which must be considered the source from which all the modern "inventions" in this branch of Fortification have been derived. Referring back to earlier German writers, it appears that Rimpler in 1673 proposed a system which is a combination of bastions with tenailles, and that Landsberg in 1712 proposed a purely tenaille system; but both these adhere to earthen ramparts and parapets, the first with revetments, the second without them, and their systems are little more than extensions of Field Fortification. But Montalembert, in his Tenaille System, replaces the simple revetment at the re-entering angles with casemated works in two stages, thus affording direct fire, both of artillery and musketry, for the defence of the ditches and faces of the redans, the remaining portion of the trace being occupied by an earthen couvre-face work, with a detached loopholed gallery in front of it, evidently the prototype of Carnot's detached revetment. The re-entering casemates are calculated to hold 24 guns in two tiers. Behind the couvre-face is the body of the place of the redan, being also fronted by a casemated gallery, and separated from the couvre-face by an inner wet-ditch. In this system, then, the defence by musketry as well as by artillery is from two levels, the upper at a moderate height above the bottom of the ditch, and not, as in the old Italian systems, at the high level of the crest of the parapet. At the gorge of each redan is placed a formidable casemated tower; whilst in front of the main ditch there is a general couvre-face provided with casemated galleries, a second or advanced ditch, places of arms in front of the re-entering angles, a covered-way, and a glacis.

The Polygonal System may, however, be considered as springing directly from Dürer's work of the same name, only in this system the simple earthen ramparts of Dürer are replaced by a combination of casemated towers, casemated galleries, and earthen couvre faces. In Dürer's polygon the sides were straight or unbroken, but in Montalembert's the centre was thrown back and formed into an Italian bastioned trace, the faces flanking the faces of the caponnière. In forts which formed a triangle or square Montalembert was rich in resources, though the massive casemated tower, casemated galleries, and earthen couvre-faces were the essential elements of all. In France, the views of Montalembert have never been received with enthusiasm, though Cherbourg is fortified in conformity to them, and it was even alleged that the corps du genie was indisposed to receive instruction from an officer of another arm; but it is more reasonable to suppose that the cherished name of Vauban has induced its officers to direct their attention rather to the improvement of the Bastioned System, which they have certainly carried to perfection, than to the development of a system depending on such different principles. In Germany, on the contrary, Speckle is less known than Vauban, and though probably a thought of Dürer may not have entered into the question, Montalembert's Systems, founded upon some of Dürer's principles, have been adopted, and may be studied in the works of defence of Coblentz. In all such works masonry defences or casemated buildings assume a character of the highest importance, but it should not be forgotten that masonry can never resist the effects of a *concentrated* fire of heavy guns, and can be considered safe only when protected by earthen masks or couvre-faces. The Maximilian towers of the defences of Lintz are no longer approved by modern engineers, and in closing the harbor of Sebastopol against approach by sinking a large portion of their own fleet, the Russians exhibited their distrust of masonry defences when opposed to ships. And this distrust is not to be wondered at when it is remembered that, to bring the guns forward enough to afford them lateral training, the walls of casemated batteries must be cut into, and greatly weakened. This great defect of masonry defences, and the evils of smoke in close casemates, are well known to engineers. In the earliest periods of Italian fortification, the necessity of increasing the active power of the flanks beyond that afforded by their length was strongly felt; and retired flanks, rising one above the other, were adopted, as well as casemated flanks admitting two or more tiers of guns, thus obtaining, as in Montalembert's System, a greater number of guns by extending the battery vertically. At first sight this appears an obvious mode of acquiring a superiority over the attack, in which the batteries can only be extended laterally, but in practice the retired flanks were soon found to be untenable, while the front flanks were complete shell-traps, and the casemates were practically useless from the difficulty of clearing the smoke from them. The systems of Montalembert partake of the same defects; and however imposing the appearance of several successive tiers of guns may be, it should be remembered that, covered by a mask, they can only be partially used when the enemy is at a considerable distance, and that exposed to view they can be easily destroyed at 2500 yards by the guns of attack of the calibres now in use. Several writers have proposed systems based upon principles similar to those of Montalembert, but it is perhaps sufficient here to mention the work of Don Jose Herrera Garcia (*Teoria Analytica de la Fortificacion Permanente*), as it is unquestionably the most remarkable development of the tower system of defence. Garcia proposes several successive lines of massive casemated buildings or towers, of an egg-shape, connected together with casemated curtains. The towers are surmounted by parapets, which at the ends next the enemy are broken into a series of smaller curves, and are retired or independent of the exterior wall or scarp. As each of these towers is defensible of itself, the work of forcing a way through three lines of them would be most formidable, but the expense of such a system would be enormous.

The system of the Swedish general Virgin belongs to the bastioned systems, but it is mentioned here in contrast to Garcia's, as it disperses in the defences separate bastioned forts,—of a form somewhat approaching to Rimpler's, and covered by outworks so arranged as to secure the inner works from injury until the enemy has effected his lodgment upon them. These forts are surrounded on all sides by ditches, and connected together by secure communications. Ingenious as Virgin's system is, it is manifest that though the loss of one fort would not insure the fall of the others, it would at least render all the interior space inclosed by the line of forts untenable, and place the town, the arsenal, or other public buildings, at the mercy of the besiegers. This may be said of all detached forts, and it must be again laid down as a maxim that the ultimate value of such forts, as a means of securing an important object, depends on an inner line of defence of a nature to resist any sudden attack or *coup-de-main*. Detached forts may be, for the purpose of keeping an enemy at a distance, more effectual than a simple continuous line, but they cease to be of use if an enemy can pass them and attack a defective interior line behind, incapable of resisting a *coup-de-main*.

It has been well stated by the French translator of Zastrow, that the reduction of a place may be considered as a certain amount of work to be performed, the magnitude of which depends on various elements, amongst which the disposition and nature of the works constitute the most important; and that the attack has to perform this work in a certain time, and with certain means, amongst which the principal elements are the quantity of heavy artillery, and the nature of the ground over which the approaches must be carried. When, therefore, it is said that a work fortified on Vauban's first system would fall on the twenty-eighth day,—on Cormontaigne's, with a cavalier entrenchment in the bastion, on the thirty-first,—it must be remembered that this implies the possibility of complete investment, and of steadily advancing the approaches over soil easily worked by the sapper; but that if the investment be incomplete, if the ground be rocky, and every inch have to be gained by hard and incessant toil, protracting the time during which the sapper is uncovered, and therefore greatly adding to the daily losses in the trenches, such periods may readily be extended to twice or three times their ordinary length.

Intrenched Camps.

It would not be proper to leave the subject without a brief description of intrenched camps, especially as they have an important bearing upon the defence of capitals, with which this article closes.

An intrenched camp is a position, prepared beforehand, in which an inferior army rests in security from the attack of a superior army, and from which it may operate upon the communications of such superior army, or in which a beaten army takes refuge for the purpose of reorganization. The position selected for an intrenched camp is usually around the capital, or around an important city, or on an important line of communication. The position should therefore contain sufficient space to receive the army for which it is constructed, to contain ample supplies of all kinds, and to keep an enemy beyond bombarding distance not only from the city, but from the camping-grounds within it. An intrenched camp should consist of a chain of independent forts, with, wherever practicable, a strong inner work; the forts should be as large as possible, and disposed in a right or slightly convex line. No fort should have undue prominence over the others, as such a fort would be a source of weakness, inasmuch as it might be attacked by itself, and being further removed from the centre of defensive operations would be more difficult to succor. The camp should be traversed by free and easy communications; and if it have an interior work, that work should command the whole of the interior. It should also possess facilities for passing rapidly from the defensive to the offensive, and sufficient interior space for the execution of such manœuvres as are necessary for the defence of the position.

Fortification of Capitals.

Whether capitals, as capitals, should be fortified has given rise to much difference of opinion; but all authorities are agreed that the capitals of highly centralized countries must be fortified. In such countries the principal resources of the state, both public and private, are collected in the capital; in it is placed the centre of government, and from it administration and organization radiate. Such a capital is truly the heart of the nation; a deadly blow to it stops the national circulation, and national paralysis may and will probably follow. Take, for example, England, perhaps the most highly centralized of countries. Can it be doubted that an enemy in possession of London could exact what terms he pleased? Upon this point the commissioners appointed to consider the defences of the United Kingdom say,—"There can be no doubt that the main object of an enemy invading the country would be to push for the capital, in the hope that, if he succeeded in obtaining command of it, such a disaster would result in our buying him off upon any terms he might think it expedient to exact." This was written in 1860, but within eleven years its general truthfulness was thoroughly established by the fall of Paris, when the exactions of the Germans were only limited by the ability of the French to comply with them. It is then scarcely too much to say that the fall of London would result in the downfall of England. Speaking of the general confusion and ruin which the presence of a hostile army on British soil must produce, Lord Overstone said: "The occupation of London by an invading army! . . . I cannot contemplate or trace to its consequences such a supposition." And he might well say so; not England only, but the cause of civilization throughout the world would be shattered by such an occupation.

At a time when capitals were by no means the *national centres* which they have since become, owing to the development of the means of locomotion, and to the discoveries of electrical science, Napoleon said that a great capital is the native place of the flower of the nation, the central point of public opinion, and the general dépôt; and he added that it is the greatest of absurdities to leave so important a place destitute of immediate defence.

How then should a capital be fortified? The answer is, that it should be so fortified that it may be safe from bombardment and from blockade, and that its defences may be beyond the control of its inhabitants.

These objects may be attained by two methods,—first by constructing a circle of detached forts round the capital, and at such a distance in advance of it as shall render investment impossible, or, secondly, by forming a cordon of intrenched camps far in advance of the capital, making at the same time such arrangements as shall facilitate the rapid concentration of troops in any of them.

With respect to these two methods there is much difference of opinion, and eminent military authorities may be cited in support of one or the other according to the bias of the writer. Nevertheless it may be safely asserted that the value of either is dependent upon the number and quality of the troops available for its service. If the troops be few, or insufficiently trained and poor in quality, then it would be proper to have recourse to a system of detached forts round and not far in advance of the capital, and so disposed that they may, in a measure at least, be manned by local auxiliary levies. If, on the other hand, the troops be fully equipped, thoroughly trained and disciplined, with high power of manœuvring, then, even though inferior in number, it may be advisable to have recourse to a cordon of intrenched camps.

Generally, if circumstances admit of its adoption, the second method is the better, especially if the camps are disposed at such intervals that an enemy in force cannot pass between them, and at such distance from the capital that, if driven out of them, there is still time left to fall back and take up some inner position upon which to deliver a decisive battle. The capital though well covered by the camps, would take no part in the active defence, and would not be attacked after the fall of one of them, while the occupants of the camps could fight with no apprehension of the populace rising in their rear, a danger to be apprehended from the most patient of people, as they become pinched by the privations and miseries of a siege.

In practice it will almost always happen that a combination of the two methods will be adopted; but whatever method be adopted it will generally be inadvisable to surround the capital, more especially if large, with a close enceinte. If, however, it have such an enceinte, the works of which the enceinte is composed should be provided with strong interior defence. In all large cities there is a considerable cosmopolitan and vagrant element, possessed of no property, and having no interest in the maintenance of order, whose contact with the soldiery may be attended with deplorable results, inasmuch as it must tend to lessen the bands of discipline, to destroy the habits of obedience, and to weaken those feelings of devotion and self-restraint which are more than ever necessary under the privations of a close siege.

Against this view it may be urged that the enceinte constructed round Paris in 1840 prevented its falling into the hands of the Prussians after the battle of Chatillon. This may be true; but in estimating the value of this enceinte it should be borne in mind that 236,000 Prussians were sufficient to shut up in it, and eventually reduce by famine, a garrison of 300,000 men, and it is certain that the absence of interior defences in that enceinte permitted a mere handful of communists to make themselves masters of Paris and its fortifications, and to force back the regular troops upon Versailles. Generally, however, the rapid growth of the population in very large cities precludes a close enceinte. Indeed the enormous extent of very large capitals, and the very long range of present artillery, render the fortification of them so costly that, in elaborating any scheme for their defence, cost must enter largely into calculation, and must materially modify theoretical and scientific conclusions.

But however elaborately the capital may be fortified, the full effect of the expenditure upon its fortifications is not obtained unless other strong places are formed in appropriate positions in relation to it; for if the capital only be fortified, defence will cease with its fall. It is asserted upon the authority of official documents that the French would not have yielded to the conditions exacted by the conquerors of Paris in 1871, if there had remained to them strong defensive positions such as Orleans, Tours, and Bourges, upon which the armies, poor in quality as they were, of Chanzy, Faidherbe, and Bourbaki could have operated. In fact, if the capital only be fortified, the object of invasion will be limited to it, and the task of the invader will be much simplified, for he will have little fear of his communications, and will be able to make his circle of investment of such strength as seems best to him. And when once the investment is completed, it is matter of great difficulty for the inclosed army, even if superior in numbers, to break out. Its best chance of breaking out is during the first days of the investment, particularly at the period when the enemy commences to extend himself round the circle of investment, and in so doing, presents his flank to it. After the investment is complete, the inclosed army is in a bad position for delivering an attack, as it must advance and deploy under concentric fire playing upon it in front and in flank. The difficulties of such an attack are exemplified in the French attack during the siege of Paris upon the 5th German corps between St. Cloud and Buzenval, when 84,000 French attacking from an interior position were defeated with a loss of 6000 men by 20,000 Germans with a loss of only 646.

The advantage of other strong places was shown when 180,000 Germans were detained for a time before Metz. But Metz and Strasburg were so far from Paris that they had scarcely any relation to it. Moreover, they lay close to the frontier; and as here there were no intermediate strong places they were rapidly isolated, and when they fell into the invader's hands proved of great service to him. The absence of an intermediate line of defence probably led to the disaster of Sedan and the fatal investment of Paris, while on the other hand the fortresses on the northern frontier, out of date and ill adapted as they were to meet the appliances of modern warfare, enabled Faidherbe's raw levies to hold their ground as successfully as they did.

If one truth be taught more clearly than another by the Franco-German war, it is the advantage, nay, the absolute necessity, of fortifying, but of properly fortifying, the capital of a highly centralized country. When we consider France deploring the flower of her youth sacrificed, the destruction wrought in her capital, and the spoliation of two of her fairest provinces, and mulcted in a money payment of £200,000,000 with an addition of £170,000,000 more to her debt,—can we avoid the conclusion that no sum spent upon fortifications would have been too large if it had preserved her from such calamities? All that Paris is to France, London is, and more, to the British empire. Paris is rich and populous; London is richer and far more populous. Paris was a tempting prize to an invader; London is more tempting and more accessible. The resources of France in her soil and in her climate are great, and her children are so thrifty that she is self-dependent; but it is far otherwise with Great Britain. She depends upon foreign countries for half the necessaries of life, and the commerce by which her supplies of food are gathered is mainly centred in her capital. France, as we see, has already recovered from the fall of her capital; but the fall of England's might be without a rise, for it might be attended with a collapse of commerce from which there should be no recovery. Yet notwithstanding the pressure of unheard-of ills, and with the regeneration of her army straining her resources heavily, France finds means to spend £4,000,000 upon the fortifications of Paris. With this example before her eyes shall Great Britain in the full tide of prosperity do less for London? (J. E. P.—C. H. N.)

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FORTROSE, a royal and parliamentary burgh of Scotland, county of Ross; is situated on the N. side of the Moray Firth, nearly opposite Fort-George, from which it is 2½ miles distant, and with which it has regular ferry communication. It was made an episcopal see in the 12th century by David I., but only a small portion of the cathedral now remains. It has a handsome Episcopal chapel and academy, and a good harbor, with a depth of 14 feet water at high tide. On account of the romantic scenery of the neighborhood, the town possesses considerable attractions as a watering place. The parish church is at Rosemarkie, about a mile eastward. Sir James Mackintosh received his early education at Fortrose. This borough unites with Inverness, Forres, and Nairn in returning one member to parliament. The population of the parliamentary burgh (which includes Rosemarkie) was 1017 in 1871.

FORTUNA, the Latin goddess of Fortune, answering to the Greek Tyche, Τύχη. This deity was of far more importance in Italy than among the Greeks, the special characteristic of the Italian or Latin religion being the worship of abstract qualities. At Rome the culture of Fortune was said to have been introduced and established by Ancus Marcius and Servius Tullius; and her temples were especially honored at Antium and Præneste, where her oracular responses were in the highest repute. She was worshipped under a vast variety of epithets, the most prominent being *virilis*, as denoting the power which secured to women the affections of their husbands; *muliebris*, a name connected with the legend which made the women of Rome prevail over the resolution of Coriolanus; *publica, privata, conservatrix, primigenia*, etc. We hear also of a Fortuna Mammosa, corresponding to the many-breasted Artemis of Ephesus, and to the Teutonic Ciza, Zizi, whose name Tacitus in his *Germania*, c. 9, seems to have confounded with that of the Egyptian Isis.

FORTUNATE ISLANDS. See CANARY ISLANDS.

FORTUNATUS, the legendary hero of one of the most popular of European chap-books. He was a native, says the story, of Famagosta in Cyprus, and after many strange adventures and vicissitudes fell in with the goddess of Fortune in a wild forest, and received from her a purse which was continually replenished as often as he drew from its stores. With this he wandered through many a city and kingdom, and at last arrived at Cairo as a guest of the sultan. Among the treasures which the sultan showed him was an old napless hat which had the curious power of transporting its wearer to any place where he desired to be. Of this he feloniously possessed himself, and returned home to Cyprus, where he lived in the free gratification of all his fancies and desires. On his death he left his purse and his hat to his sons Ampedo and Andelosia; but instead of harmoniously putting them to use, they were jealous of each other, and by their recklessness and folly soon landed themselves in the depths of misery. The *motif* of the story is very obvious: in the words of the preface, the reader should learn that all men should desire reason and wisdom before all the treasures of the world. In its full form the history of Fortunatus is a brisk narrative of considerable length, occupying in Simrock's *Die Deutschen Volksbücher*, vol. iii., upwards of 158 pages. The scene is being continually shifted—from Cyprus to Flanders, from Flanders to London, from London to France; and a large number of secondary characters appear from time to time on the stage. The general features of the style and the allusions seem to indicate a comparatively modern date for the authorship; but the nucleus of the legend can be traced back to a much earlier period. The stories of Jonathas and the three jewels in the *Gesta Romanorum*, of the emperor Frederick and the three precious stones in the *Cento Novelle Antiche*, of the Mazin of Khorassan in the *Thousand and One Nights*, and the flying scaffold in the *Bahar Danush*, have all a certain similarity. The earliest known edition of the German text of Fortunatus appeared at Augsburg in 1509, and the modern German investigators are disposed to regard this as the original form. Innumerable rifacimentos have been made in French, Italian, Dutch, English, etc., and cheap editions are still common enough on the bookstalls. The story was dramatized by Hans Sachs in 1553, and by Thomas Dekker in 1600; and the latter comedy appeared in a German translation in *Englische Komödien und Tragödien*, 1620. Tieck has utilized the legend in his *Phantasus*, and Chamisso in his *Peter Schlemihl;* and Uhland has left an unfinished narrative poem entitled "Fortunatus and his Sons."

See Dr. Fr. W. V. Schmidt's *Fortunatus und seine Söhne, eine Zauber-Tragödie, von Thomas Decker, mit einem, Anhang*, etc. Berlin, 1819; Görres, *Die deutsche Volksbücher*, 1807.

FORTUNATUS, VENANTIUS HONORIUS CLEMENTIANUS, bishop of Poitiers, and the chief Latin poet of his time, was born near Ceneda in Treviso, in 530. He studied at Milan and Ravenna, with the special object of excelling as a rhetorician and poet, and in 565 he journeyed to France, where he was received with much favor at the court of Sigbert, king of Austrasia, whose marriage with Brunhild he celebrated in an *epithalamium*. After remaining a year or two at the court of Sigbert, he travelled in various parts of France, visiting persons of distinction, and composing short pieces of poetry on any subject that occurred to him. At Poitiers he visited Queen Radegonda, who lived there in retirement, and she induced him to prolong his stay in the city indefinitely. Here he also enjoyed the friendship of the famous Gregory, bishop of Tours, and other eminent ecclesiastics. He was elected bishop of Poitiers in 599, and died about 609. The later poems of Fortunatus were collected in 11 books, and consist of hymns, epitaphs, poetical epistles, and verses in honor of his patroness Radegonda and her sister Agnes, the abbess of a nunnery at Poitiers. He also wrote a large poem in 4 books in honor of St. Martin, and several lives of the saints in prose. His prose is stiff and mechanical, but most of his poetry has an easy rhythmical flow.

An edition of the works of Fortunatus was published by Ch. Brower at Fulda in 1603, 2d edition at Mayence in 1617. The best edition is that of M. A. Luschi, Rome, 1785, which was afterwards reprinted in Migne's *Patrologiæ cursus completus*, vol. 88.

FORT WAYNE, or, as it is sometimes called, "Summit City," a city of the United States, at the head of Allen county, Indiana, situated 751 miles W. of New York and 102 N.E. of Indianapolis, at the junction of the St. Joseph and the St. Mary, which form what is known as the Maumee River. The Wabash and Erie canal passes through the town, and no fewer than eight railway lines branch out from it in various directions. Besides the extensive works maintained by several of the railway companies for the building of carriages, etc., there are a number of engineering establishments, planing mills, flour mills, and tanneries, sash and door works, and a woollen factory. The churches are twenty-seven in all; the educational institutions comprise a high school, a normal school, a Methodist college (founded in 1846), the Concordia Lutheran college (founded in 1850), and two public libraries; and among the other public buildings may be mentioned the court-house, the county jail, the city hospital, and the orphans' home. Interior communication is facilitated by six miles of tramway lines. In the early part of the 18th century the French established a trading post on the site of the present city, which took its name, however, from a fort erected in 1794 by General Wayne. The town was laid out in 1825, but did not become of much importance till the opening of the Wabash and Erie canal in 1840. In that year it attained the rank of a city, though its inhabitants numbered only 2080. By 1850 they had increased to 4282, by 1860 to 10,388, and by 1870 to 17,718.

FORUM, the word employed by the Romans to denote any open place in which men congregated for the transaction of mercantile or political business. It is connected with *foris*, and the same root also appears in the Greek *θύρα*, the Sanskrit *dvâra*, and the English *door*. In the laws of the Twelve Tables it occurs as equivalent to the vestibule of a tomb (Cic., *De Leg.*, ii. 24); in a Roman camp the forum was an open place immediately beside the prætorium; and perhaps the word may at one time have been applied generally to the space in front of any public building or gateway. In the city itself, however, during the period of the early history, forum was almost a proper name, denoting the flat and formerly marshy space between the Palatine and Capitoline hills, which probably even at the regal period had afforded the accommodation necessary for such public meetings as could not be held within the area Capitolina (see ROME). During the days of the republic the city had only one forum, but under the empire a considerable number both of fora civilia and of fora venalia came into existence. To the former class belonged those of Julius and of Augustus, and also that of Nerva, which was sometimes called Transitorium or Pervium. Of the latter order the most important were the Olitorium, Piscatorium, and Boarium. Those called after Trajan, Sallust, Diocletian, and Aurelian were probably intended merely as public lounges. The word forum frequently appears in the names of Roman market towns; as, for example, in Appii Forum, Forum Julii (Frejus), Forum Livii (Forlì), Forum Sempronii (Fossombrone). The fora were distinguished from mere vici by the possession of a municipal organization, which, however, was less complete than that of a prefecture. In legal phraseology, which distinguishes the forum commune from the forum privilegiatum, and the forum generale from the forum speciale, the word is practically equivalent to our "court" or "jurisdiction."

FOSBROKE, Thomas Dudley (1770–1842), an English antiquary, was born in London, and was called Dudley after a cousin of that name, esquire of Lebotwood Hall in Shropshire. Fosbroke has given accounts of himself and family in most of his works, accompanied with lists and statements of facts supporting possible alliances. He was of an old Staffordshire family, no individual of which ever attained to any particular eminence. It had long been the custom in this family that one of the sons should enter the church, and the dying wish of the father in this case was that his son should take holy orders. Going to St. Paul's school at nine years of age, Fosbroke took in 1785 a Tesdale scholarship at Pembroke College, Oxford, and graduated as M.A. in 1792. In that year he took also deacon's orders and settled in the curacy of Horsley in Gloucestershire, where he remained till 1810, taking priest's orders in 1794. In 1810 Fosbroke removed to Walford in Herefordshire, and passed there the remainder of his life, as curate till 1830, and afterwards as vicar of the parish. In 1796 he published the *Economy of Monastic Life*, which is, according to his own account, "a poem in Spenserian measure and style, written upon Darwin's doctrine of using only precise ideas of picturesque effect, chiefly founded on the sense of vision." Whatever all that may mean the poem is entirely unreadable, although "the reviews were favorable." This with other poetical attempts of Fosbroke's was reprinted at the end of the third edition (1843) of his next book, the *British Monachism*, 2 vols. 8vo, 1802,—a compilation from manuscripts in the British Museum and Bodleian libraries, with subordinate use of printed authorities, of facts relating to the manners and customs of the monks and nuns of England, which was very favorably received. In the second and third editions this work was much enlarged. In 1799 Fosbroke had been elected fellow of the Society of Antiquaries, and resolved to devote himself to the study of archæology. *British Monachism*, the first result of his studies, was always his favorite work. In 1807 was published by subscription his *Abstracts and Records of Manuscripts respecting the County of Gloucester*, after which he entered into an engagement with Sir Richard Philips for several important works, including an encyclopædia of antiquities; but owing to the commercial failure of that enterprising gentleman in 1810, these plans fell through. In 1814 he published an *Abridgment of Whitby's Commentary on the New Testament;* in 1819 a *History of the City of Gloucester*, from new materials; in 1818 *The Wye Tour;* and in 1821 its companion, *Ariconensia, or Archæological Sketches of Ross and Archenfeld, illustrative of the Campaigns of Caractacus and the Station Ariconium.* In 1821 also was issued his edition of the *Berkeley Manuscripts*, with a history of the castle and town of Berkeley and a life of Jenner. The work for which Fosbroke is best remembered, the *Encyclopædia of Antiquities*, was first published in 1824, 2 vols. 4to; a second enlarged edition appeared in 1840. This work, though perhaps open to objection on account of a certain incoherence and disproportion, embodies the results of a large amount of reading among manuscript and other obscure sources. A sequel to this, called *Foreign Topography*, was published in 1828. His other works are *A Picturesque and Topographical Account of Cheltenham and its Vicinity* (1826); *The Tourist's Grammar, or Rules relating to the Scenery and Antiquities incident to Travellers* (1826); "A Treatise on the Arts, etc., of the Greeks and Romans" (1833), for Lardner's *Cabinet Cyclopædia;* "Extracts from Manuscripts relating to English History," and "Illustrations of the Constitution of our Ancient Parliaments," contributed to the *Transactions of the Royal Society of Literature*, of which body Fosbroke was elected honorary associate in 1827. He also made extensive researches into the pedigree and history of the Clinton family at the desire of the duke of Newcastle, in the possession of whom three large folio volumes of his MSS. now remain. Fosbroke was in the early part of this century a regular contributor to the *Gentleman's Magazine* of both original articles and reviews. Although without pretension to style as an author or judgment as a critic of antiquities, he was a student and writer of good aims; and despite a recurring tendency to whine at his fate in prefaces, his works can be read with some pleasure and profit. He died at Walford on the 1st January, 1842.

FOSCARI, Francesco (d. 1457), doge of Venice, was born probably about 1372. He was of a patrician family, early displayed an ambitious temper, and rose to high honors in the state. He was already a member of the great council, when in 1412 he was named one of the guardians of the young marquis of Mantua; and by his wise administration he won the gratitude both of his ward and of the people. In 1421, being then one of the *procuratori* of St. Mark, he zealously advocated war on behalf of Florence against the powerful duke of Milan. The reigning doge, Tommaso Mocenigo, was opposed to this policy; and when dying two years later, he warned his countrymen against electing Foscari as his successor, on the ground that he would plunge Venice into a disastrous war. The warning, however, was ineffectual; for after six days' deliberations, with nine scrutinies, Foscari was elected doge. His success was ensured by bribery on a large scale. In proclaiming his election, a significant omission was made from the customary formula, the words which recognized the popular share in the appointment being entirely dropped. The ancient formula was never again used. Florence continued to press for an alliance with Venice against Milan, and the negotiations were still going on when, in 1425, the famous Carmagnola, who had for eight years commanded the Milanese armies and made many conquests for his master, the duke Filippo Maria, arrived at Venice, a fugitive in disgrace. His influence gave the decisive impulse to the hesitating Venetians; and in January, 1426, a league was formed and war was declared against Milan, Carmagnola being appointed captain-general of the army of Venice. Brescia and Cremona were conquered for Venice, and the war was carried on with alternation of success and failure and intervals of peace till 1433, when Foscari consented to treat, and peace was signed at Ferrara. The doge then offered his abdication, but the senate refused to accept it. After another troublous period of nine years he renewed his proposal, when the senate not only refused as before, but exacted from him an oath that he would retain his sovereignty for life. To the toils and harassments of office and of war were added, during his remaining years, great family sorrows. He had four sons, three of whom were already dead. The fourth, Giacopo, connected himself by marriage in 1441 with the noble house of Contarini. Within four years of this event, Giacopo was denounced to the council of ten as having received presents from several foreign princes, one of the highest offences a noble could be guilty of. He was tortured in the presence of his father, and, having made a confession, was condemned to perpetual banishment to Napoli di Romania. The aged doge was compelled to pronounce the sentence on his son. Five years later (1450), the assassination of Hermolas Donati, one of the ten, took place at Venice, and suspicion fastened on the banished Giacopo, one of whose servants was seen at Venice at the time. The servant was arrested and repeatedly tortured, but no confession was wrung from him. Giacopo was then recalled from his place of exile, was again put on the rack in his father's presence, and although not a particle of evidence was to be had against him, he was condemned and banished to the isle of Candia. The real assassin was afterwards discovered, but the sentence against Giacopo was unrevoked. He was forbidden all communication with his wife and family, and life became an intolerable burden. In 1456 he wrote a request to the duke of Milan to intercede for him, and purposely left the letter open and discoverable. It was presented to the council of ten, and his end was gained, for he was immediately summoned to his native city to answer the charge of seeking foreign intercession. For the third time he was examined before his father, the doge. This time he confessed the crime of which he was accused. He was nevertheless put on the rack no less than thirty times with a view to extort a declaration of innocence, and this in his father's presence. But it was in vain, and the wretched man, torn and dislocated, was once more banished. He died shortly afterwards in Candia. The father henceforth remained in retirement, incapable of discharging the duties of his office. At length through the intrigues of Giacopo Loredano, a member of a family which had an hereditary feud with the Foscari, the council were induced to request his abdication. He pleaded his oath not to resign which they had compelled him to take; but they discharged him of it, declared the dogate vacant, gave him a pension, and expelled him from the palace (1457). They wished him to withdraw by a private staircase to escape the notice of the people, but this he firmly refused to do. Supported by his brother, he slowly descended the giants' stairs, and with the parting words—"My services brought me within these walls, the malice of my enemies drives me away,"—he took his leave (Oct. 25). A decree of the council prohibited any mention of his name, under penalty of death, thus suppressing all expression of popular regret. On the 30th of the same month his successor was elected, and the announcement of the election by the bell of the campanile agitated him so violently that he ruptured a blood-vessel and died in a few hours. One year after his death it was declared that the council of ten had exceeded their authority. The melancholy story of the Foscari furnished Byron with a theme for a tragedy, and is narrated by Rogers in one section of his *Italy*—the two poems being published within a few days of each other (1821).

FOSCARINI, MARCO (1696–1763), doge of Venice, historian, was born January 30, 1696. He was of an illustrious patrician family, and his fine character and superior abilities opened for him at an early age the path of public service and advancement. He rose through the regular stages of office to be *cavaliere* and *procuratore* of St. Mark, and was nominated historiographer of the republic. It was intended that he should take up and continue the story from the point to which it had been brought by Michele Foscarini and the senator Garzoni. But his services were turned into another channel. He was entrusted successively with important embassies to the courts of Vienna, Rome, and Turin, his task being to maintain the strict neutrality of Venice in the wars between the French and the Imperialists. During these embassies he drew up, after the manner of Venetian ambassadors, reports of his negotiations and proceedings, and also of his observations of affairs at the various courts. Thus removed from Venice and from access to the public archives, from which the materials of his projected history must have been drawn, it was impossible for him to write it. He undertook, however, to collect materials for a literary history of his country, proposing to treat the subject under two heads, first the useful (or scientific) literature, and secondly the more strictly literary works. In 1752 appeared the first volume of the first division, in four books; and this remains a fragment, no more having been published. Foscarini after his return from Turin was placed at the head of the university of Padua, in the conduct of which he brought about some important reforms. In 1762 he rose to the highest dignity of the state, being elected to succeed Francesco Loredano as doge. Among the other literary remains of Foscarini are an oration on the administration of Dalmatia, not published till 1831; an account of the imperial court and administration, published in 1843; a report on his Sardinian embassy, etc.; besides several unpublished pieces. He held the dogate for ten months only, dying on the 31st of March, 1763. He left a large collection of books and manuscripts, the latter now forming part of the Imperial Library, Vienna.

FOSCARINI, MICHELE (1632–1692), Venetian historian, was born in 1632. By the deaths of his father and mother he became head of his house at the age of nineteen. Of patrician rank, he entered upon official life in 1657, and after filling various posts became in 1662 one of the *avogadori* of the republic. Two years later he was appointed governor of Corfu with the title of *provveditore* and captain. Returning to Venice in 1668, he was selected to fill some of the most honorable offices of the republic. On the death of Battista Nani in 1678, Foscarini was called to succeed him as historiographer of Venice. He continued the history begun by Bembo, and carried on by other writers, from 1669 to 1690, but had not quite completed his work when he died suddenly, March 31, 1692. The *Istoria della Repubblica Veneta* was published by his brother Sebastiani in 1696, and has been several times reprinted. Foscarini was author also of two *Novelle* written in his youth; and he annotated Caramella's *Museum illustriorum Poetarum* (1653).

FOSCOLO, UGO (1778–1827), the Italian writer who next to Alfieri has most contributed to free the literature of his country from the pedantries and affectations of the 17th and 18th centuries, was born at Zante on the 26th of January, 1778. On the death of his father, a physician at Spalatro, in Dalmatia, the family removed to Venice, and in the university of Padua Foscolo prosecuted the studies begun in the Dalmatian grammar school. The fact that amongst his Paduan masters was the Abbé Cesarotti, whose version of Ossian had made that work highly popular in Italy, was not without influence on Foscolo's literary tastes, and his early knowledge of modern facilitated his studies in ancient Greek. His literary ambition revealed itself by the appearance in 1797 of his tragedy *Tieste*—a production which obtained a certain degree of success. Foscolo, who from causes not clearly explained, had changed his Christian name Niccolo to that of Ugo, now began to take an active part in the stormy political discussions which the fall of the republic of Venice had provoked. He was a prominent member of the national committees, and addressed an ode to Napoleon the liberator, expecting from the military successes of the French general, not merely the overthrow of the effete Venetian oligarchy, but the establishment of a free republican government. The treaty of Campo Formio (17th Oct., 1797), by which Napoleon handed Venice over to the Austrians, gave a rude shock to Foscolo, but did not quite destroy his hopes. The state of mind produced by that shock is reflected in the letters of Jacopo Ortis, a species of political Werther,—for the hero of Foscolo embodies the mental sufferings and suicide of an undeceived Italian patriot just as the hero of Goethe places before us the too delicate sensitiveness embittering and at last cutting short the life of a private German scholar. The story of Foscolo, like that of Goethe, had a groundwork of melancholy fact. Jacopo Ortis had been a real personage; he was a young student of Padua, and committed suicide there under circumstances akin to those described by Foscolo. At this period Foscolo's mind appears to have been only too familiar with the thought of suicide. Cato and the many classical examples of self-destruction scattered through the pages of Plutarch appealed to the imaginations of young Italian patriots as they had done in France to those of the heroes and heroines of the Gironde. In the case of Foscolo as in that of Goethe, the effect produced on the writer's mind by the composition of the work seems to have been beneficial. He had seen the ideal of a great national future rudely shattered; but he did not despair of his country, and sought relief in now turning to gaze on the ideal of a great national poet. At Milan, whither he repaired after the fall of Venice, he was engaged in other literary pursuits besides the composition of *Ortis*. The friendship formed there with the great poet Parini was ever afterwards remembered with pride and gratitude. The friendship formed with another celebrated Milanese poet soon gave place to a feeling of bitter enmity. Still hoping that his country would be freed by Napoleon, he served as a volunteer in the French army, took part in the battle of the Trebbia and the siege of Genoa, was wounded and made prisoner. When released he returned to Milan, and there gave the last touches to his *Ortis*, published a translation of and commentary upon *Callimachus*, commenced a version of the *Iliad*, and began his translation of Sterne's *Sentimental Journey*. The result of a memorandum prepared for Lyons, where, along with other Italian delegates, he was to have laid before Napoleon the state of Italy, only proved that the views cherished by him for his country were too bold to be even submitted to the dictator of France. The year 1807 witnessed the appearance of his *Carme sui Sepolcri*, of which the entire spirit and language may be described as a sublime effort to seek refuge in the past from the misery of the present and the darkness of the future. The mighty dead are summoned from their tombs, as ages before they had been in the masterpieces of Greek oratory, to fight again the battles of their country. The inaugural lecture on the origin and duty of literature, delivered by Foscolo in January, 1809, when appointed to the chair of Italian eloquence at Pavia, was conceived in the same spirit. In this lecture Foscolo urged his young countrymen to study letters, not in obedience to academic traditions, but in their relation to individual and national life and growth. The sensation produced by this lecture had no slight share in provoking the decree of Napoleon by which the chair of national eloquence was abolished in all the Italian universities. Soon afterwards Foscolo's tragedy of *Ajax* was represented but with little success at Milan, and its supposed allusions to Napoleon rendering the author an object of suspicion, he was forced to remove from Milan to Tuscany. The chief fruits of his stay in Florence are the tragedy of *Ricciarda*, the *Ode to the Graces*, left unfinished, and the completion of his version of the *Sentimental Journey*. His version of Sterne is an important feature in his personal history. When serving with the French, he had been at the Boulogne camp, and had traversed much of the ground gone over by Yorick; and in his memoir of Didimo Cherico, to whom the version is ascribed, he throws much curious light on his own character. He returned to Milan in 1813, until the entry of the Austrians; thence he passed into Switzerland, where he wrote a fierce satire in Latin on his political and literary opponents; and finally he sought the shores of England at the close of 1816.

During the eleven years passed by Foscolo in London, until his death there, he enjoyed all the social distinction which the most brilliant circles of the English capital confer on foreigners of political and literary renown, and experienced all the misery which follows on a disregard of the first conditions of domestic economy. His contributions to the *Edinburgh* and *Quarterly Reviews*, his dissertations in Italian on the text of Dante and Boccaccio, and still more his English essays on Petrarch, of which the value was enhanced by Lady Dacre's admirable translations of some of Petrarch's finest sonnets, heightened his previous fame as a man of letters. But his want of care and forethought in pecuniary matters involved him in much embarrassment, and at last consigned him to a prison; and when released, he felt bitterly the change in his social position, and the coldness now shown to him by many whom he had been accustomed to regard as friends. His general bearing in society—if we may accept on this point the testimony of so keen an observer and so tolerant a man as Sir Walter Scott—had unhappily not been such as to gain and retain lasting friendships. He died at Turnham Green on the 10th of October, 1827. Forty-four years after his death, in 1871, his remains were brought to Florence, and with all the pride, pomp, and circumstance of a great national mourning, found their final resting place beside the monuments of Macchiavelli and Alfieri, of Michelangelo and Galileo, in Italy's Westminster Abbey, the church of Santa Croce. To that solemn national tribute Foscolo was fully entitled. For the originality of his thoughts and the splendor of his diction his country honors him as a great classic author. He had assigned to the literature of his nation higher aims than any which it previously recognized. With all his defects of character, and through all his vicissitudes of fortune, he was an ill-judging but always a sincere and courageous patriot. He was, if ever Italian deserved those titles, the precursor and prophet of the unity and independence which his country now enjoys.

Ample materials for the study of Foscolo's character and career may be found in the complete series of his works published in Florence by Le Monnier. The series consists of *Prose letterarie*, in 4 vols., 1850; *Epistolario*, in 3 vols., 1854; *Prose politiche*, 1 vol., 1850; *Poesie*, 1 vol., 1856; *Lettere di Ortis*, 1 vol., 1858; *Saggi di critici storico-letterario*, 1st vol. 1859, 2d vol. 1862. To this series must be added the very interesting work published at Leghorn in 1876, *Lettere inedite del Foscolo, del Giordani, e della Signora di Stael, a Vincenzo Monti*. The work published at Florence in the summer of 1878, *Vita di Ugo Foscolo, di Pellegrino Artusi*, throws much doubt on the genuineness of the text in Foscolo's writings as given in the complete Florence edition, whilst it furnishes some curious and original illustrations of Foscolo's familiarity with the English language. (J. M. S.)

FOSS, **Edward** (1787–1870), a solicitor by profession, was the author of a considerable number of works on legal antiquities, the most important of which are his *Judges of England*, in 9 vols., and his *Biographia Juridica, a Biographical Dictionary of English Judges*. The accuracy and extensive research of the author have made these—especially the larger work—of great historical authority.

FOSSANO, a city of Italy, in the province of Cuneo, on the Stura, about 40 miles from Turin. It is a well-built prosperous place, with a cathedral, an academy of science and letters, a public library, a philharmonic academy, and a veterinary college. Silk and leather are manufactured, and a trade is maintained in grain and cattle. In the 11th century Fossano was a little borough, but in the 13th it was peopled by a body of refugees and raised to considerable importance. The Astigiani family surrounded it with walls shortly afterwards; and in 1314 Filippo d'Acaia laid the foundation of the great four-towered castle, which still forms one of its most striking features. The population in 1871 was 7272 for the town, and 16,544 in the commune.

FOSSANO, **Ambrogio Stefani da**, better known as Ambrogio Borgognone, or simply Il Borgognone, was the foremost painter of the Milanese school, so far as it is possible to speak of a Milanese school independently of Leonardo da Vinci. It is well known how, when Leonardo left Florence to settle at Milan, the influence of his powerful genius presently transformed and dominated the art of those parts of Lombardy. Borgognone was approximately contemporary with Leonardo, but represented, at least during a great part of his career, the tendencies of Lombard art anterior to the arrival of that master—the tendencies which he had adopted and perfected from the hands of his predecessors Foppa and Zenale. We are not precisely informed of the dates either of the death or the birth of Borgognone. His fame is principally associated with that of one great building, the Certosa, or church and convent of the Carthusians at Pavia, for which he worked much and in many different ways. It is certain, indeed, that there is no truth in the tradition which represents him as having designed, in 1473, the celebrated façade of the Certosa itself. His residence there appears to have been of eight years' duration, from 1486, when he furnished the designs of the figures of the Virgin, saints, and apostles for the choir-stalls, executed in *tarsia* or inlaid wood work by Bartolommeo Pola, till 1494, when he returned to Milan. Only one known picture, an altar-piece at the church San Eustorgio, can with probability be assigned to a period of his career earlier than 1486. For two years after his return to Milan he worked at the church of San Satiro in that city. From 1497 he was engaged for some time in decorating with paintings the church of the Incoronata in the neighboring town at Lodi. Our notices of him thenceforth are few and far between. In 1508 he painted for a church in Bergamo; in 1512 his signature appears in a public document of Milan; in 1524—and this is our last authentic record—he painted a series of frescoes illustrating the life of St. Sisinius in the portico of San Simpliciano at Milan. Without having produced any works of signal power or beauty, Borgognone is a painter of marked individuality. He holds an interesting place in the most interesting period of Italian art. The National Gallery of London has two fair examples of his work—the separate fragments of a silk banner painted for the Certosa, and containing the heads of two kneeling groups severally of men and women, and a large altar-piece of the marriage of St. Catherine, painted for the chapel of Rebecchino near Pavia. But to judge of his real powers and peculiar ideals—his system of faint and clear coloring, whether in fresco, tempera, or oil—his somewhat slender and pallid types, not without something that reminds us of northern art in their Teutonic sentimentality as well as their Teutonic fidelity of portraiture—the conflict of his instinctive love of placidity and calm with a somewhat forced and borrowed energy in figures where energy is demanded—his conservatism in the matter of storied and minutely diversified backgrounds—to judge of these qualities of the master as they are, it is necessary to study first the great series of his frescoes and altar-pieces at the Certosa, and next those remains of later frescoes and altar-pieces at Milan and Lodi, in which we find the influence of Leonardo and of the new time mingling with, but not expelling, his first predilections.

Calvi, *Visita alla Certosa di Pavia*, and *Notizie*, vol. ii.; Crowe and Cavalcaselle, *Hist. of Painting in North Italy*, vol. ii. p. 41, *sq.*

FOSSOMBRONE, a town of Italy, in the province of Pesaro and Urbino, about 7 miles from Urbino, on the left bank of the Metauro, which is there crossed by a fine bridge of a single arch. It is commanded by an old castle on the heights, and it possesses a cathedral with ancient inscriptions and pictures, a Capuchin church, a seminary, and the vestiges of a Roman theatre. There are several silk factories in the town, and the silk produced in the district ranks as the finest in all Italy. The population of the town proper in 1871 was 3821, and of the commune 9056.

Of the origin of Fossombrone nothing is definitely known. It appears by the name of Forum Sempronii as a flourishing municipal town under the Roman empire. Ruined by the Goths and Lombards, it was soon afterwards restored on a slightly different site. The Malatesta and Galeazzo families had for a long time possession of the lordship, but they sold it in 1440 to the duke of Urbino.

FOSSOMBRONI, Vittorio (1754–1844), a Tuscan statesman and mathematician, was born at Arezzo in 1754. He was educated at the university of Pisa, where he devoted himself particularly to mathematical science. He obtained an official appointment in Tuscany in 1782, and twelve years later was entrusted by the grand-duke with the direction of the works for the drainage of the Val di Chiana, a task for which he had already shown his fitness by the publication of a treatise on the subject. In 1796 he was made minister for foreign affairs; and on the erection of the grand-duchy into the ephemeral kingdom of Etruria, he became a member of the commission of finance. After the annexation of Tuscany to the French empire, he was created by Napoleon I. chevalier of the Legion of Honor. He was also named head of the commission established for carrying out the drainage of the Pontine marshes. He became first minister of the restored grand-duchy (1814), and his administration, which was only terminated by his death, greatly contributed to promote the well-being of the country. Fossombroni was author of many treatises on mathematical and mechanical science, most of them relating to hydraulics. At the age of seventy-eight he married, and twelve years afterwards died, in 1844, at the age of ninety.

FOSTER, John (1770–1843), an English author and dissenting minister, generally known as the "Essayist," was born in a small farmhouse near Halifax, Yorkshire, September 17, 1770. Partly from constitutional causes, but partly also from the want of proper companions, as well as from the grave and severe habits of his parents, the outward and physical life of boyhood had for him scarcely an existence, and his earlier years were enshrouded in a somewhat gloomy and sombre atmosphere, which was never afterwards wholly dissipated. His youthful energy, finding no proper outlet, developed within him a tendency to morbid intensity of thought and feeling; and, according to his own testimony, before he was twelve years old he was possessed of a "painful sense of an awkward but entire individuality;" what observations he made on men and things were characterized by a precocious shrewdness and gravity, but he lived in an interior world of emotions and sentiments which he recoiled from communicating to any human being; his imagination often exercised on him a tyrannous sway, endowing past or fictitious events with a stronger and more importunate reality than the actual circumstances which surrounded him, and sometimes arousing almost insupportable emotions of pain or terror. A partial counteractive to the predominance of this inward life was supplied by his love of natural scenery, but even here his interest was rather in the grand and sublime than in the beautiful, and nature awakened his strong enthusiasm more frequently than it inspired him with quiet and genial enjoyment. The most wholesome influence exercised on his earlier years was perhaps that obtained from the perusal of books of travel—a species of literature for which he had always a decided preference. It supplied him with actual scenes and adventures on which to exercise his imagination, and helped to deliver him from a too constant contemplation of abstractions and a too minute analysis of his own moods and sentiments. His moral feelings in youth were not only sensitive but deeply rooted and constant and steadfast in their influence, being manifested in entire dutifulness to his parents, strong but "not malicious" antipathies, habitual abhorrence of cruelty, intense love of the heroic, and a tone of mind whose seriousness was excessive.

The small income accruing to Foster's parents from their farm they supplemented by weaving, and at an early age he began to assist them by spinning wool by the hand wheel, and from his fourteenth year by weaving double stuffs. Even "when a child," however, he had the "feelings of a foreigner in the place;" and though he performed his monotonous task with conscientious diligence, he succeeded so indifferently in fixing his wandering thoughts upon it that his work never without difficulty passed the ordeal of inspection. There is little information as to the manner in which he obtained his primary education, but at an early period he had acquired a great taste for reading, to gratify which he sometimes shut himself up alone in a barn, afterwards working at his loom "like a horse," to make up for lost time. He had also at this period "a passion for making pictures with a pen." Shortly after completing his seventeenth year he became a member of the Baptist church at Hebden Bridge, with which his parents were connected; and with the view of preparing himself for the ministerial office, he began about the same time to attend a seminary at Brearley Hall conducted by his pastor Dr. Fawcett. The mental processes of Foster followed a course which was entirely their own, and the manner of their operation was often awkward and unwieldy. He had difficulty in bending his attention to the continuous contemplation of a subject as it had been viewed by others, and smaller niceties and details only made an impression on his mind after a repeated perusal. He therefore mastered his tasks very slowly and with great labor, and his application was so intense and protracted as to awaken the serious anxiety of his friends. To excel in literary composition was the purpose which occupied his most eager attention, and with a view to obtain facility and variety of diction, it was his custom to select paragraphs from different writers and to alter the structure and expression of each sentence in as many different ways as his ingenuity could invent, a method which, if it helped him to acquire the particular kind of flexibility which his style afterwards manifested, was perhaps also in part the means of betraying him into his occasional use of lumbering expressions, and of a harsh, involved, or clumsy order of arrangement.

After remaining three years at Brearley Hall he was admitted to the Baptist College, Bristol, and on finishing his course of study at this institution, he obtained an engagement at Newcastle-on-Tyne, where he preached to an audience of less than a hundred persons, in a small and dingy room situated near the river at the top of a flight of steps called Tuthill stairs. At Newcastle he remained only three months. In the beginning of 1793 he proceeded to Dublin, where after failing as a preacher he attempted to revive a classical and mathematical school, but with so little success that he did not prosecute the experiment for more than eight or nine months. From 1797 to 1799 he was minister of a Baptist church at Chichester, but though he applied himself with more earnestness and perseverance than formerly to the discharge of his ministerial duties, his efforts produced little apparent impression, and the gradual diminution of his hearers necessitated his resignation. After employing himself for a few months at Battersea in the instruction of twenty African youths brought to England by Zachary Macaulay, with the view of having them trained to aid as missionaries to their fellow-countrymen, he in 1800 accepted the charge of a small congregation at Downend, Bristol, where he continued about four years. In 1804, chiefly through the recommendation of Robert Hall, he became pastor of a congregation at Frome, but a swelling in the thyroid gland compelled him in 1806 to resign his charge. In the same year he published the volume of *Essays* on which his literary fame most largely if not mainly rests. They were written in the form of letters addressed to the lady whom he afterwards married, and consist of four papers,—"On a Man writing Memoirs of himself;" "On Decision of Character;" "On the Application of the Epithet Romantic;" and "On some Causes by which Evangelical Religion has been rendered unacceptable to Men of Cultivated Taste." The success of this work was immediate, and was so considerable, that on resigning his charge he determined to adopt literature as his profession. The *Eclectic Review* was the only periodical with which he established a connection; but his contributions to that journal, which were begun in 1807, number no fewer than 185 articles. On his marriage in May, 1808, he removed to Bourton-on-the-Water, a small village in Gloucestershire, where he remained till 1817, when he returned to Downend and resumed his duties to his old congregation. Here he published in 1820 his *Essay on Popular Ignorance*, which was the enlargement of a sermon originally preached on behalf of the British and Foreign School Society. He describes this essay with a certain degree of happiness and accuracy as a "broad, true, and strongly delineated picture of the intellectual and moral state of the mass of our people;" only it must be added that the contemplation of the gloomy features of his subject has so reacted on his vision that an artificially darkened atmosphere seems to overspread his whole canvas, and his picture somewhat resembles that of a landscape painted during an eclipse. In 1821 he removed to Stapleton near Bristol, and in 1822 he began a series of fortnightly lectures at Broadmead Chapel, Bristol, which were afterwards published in 2 vols. On the settlement of Robert Hall at Bristol this service was discontinued, as in such circumstances it appeared to Foster to be "altogether superfluous, and even bordering on impertinent." The health of Foster during the later years of his life was somewhat infirm, the result chiefly of the toil and effort of literary composition; and the death of his only son, his wife, and the greater number of his most intimate friends, combined with his bodily ailments to lend additional sombreness to his manner of regarding the events and arrangements of the present world—the "visage of death" being almost his "one remaining luminary." He died at Stapleton, 15th October, 1843.

The cast of Foster's mind was meditative and reflective rather than logical or metaphysical, and though holding moderately Calvinistic views, his language even in preaching very seldom took the mould of theological forms. His "apprehension of the divine mercy, and of the terms of hope and safety for poor mortals, was," he says, "widely remote from the austerity of the systematic divines." He rejected the doctrine of eternal punishment, because the idea of such protracted and hopeless misery following such a "brief trial and sojourn on earth" seemed inconsistent with the divine goodness, and he was thus compelled to believe that the language of Scripture which seemed to support this doctrine was susceptible of another and milder interpretation. Though always retaining his connection with the Baptist denomination, the evils resulting from organized religious communities seemed to him so great that he came to be "strongly of opinion that churches are useless and mischievous institutions, and the sooner they are dissolved the better." The only Christian observances which he regarded as of any importance were public worship and the Lord's Supper, and it so happened that he never administered the ordinance of baptism.

Though he was mild and charitable in his interpretation of the conduct of individuals, his moral constitution was narrow and stern rather than sympathetic, and his creed left little room for laughter, and on the question of amusements was strongly puritanical. The dark and sombre scenes which his imagination so vividly pictured forth riveted his contemplation by a fascination from which he vainly struggled to be free. With such mournful views of life the "weight of this unintelligible world" pressed rather heavily upon him, and his cast of thought is largely colored by a constant reference to the "endless future." He was a firm believer in supernatural appearances, and cherished a longing hope that a ray of light from the other world might sometimes in this way be vouchsafed to mortals.

Apart from the singularity of his modes of thought, and the unusual forms of his spoken as well as his written style, Foster was constitutionally unfitted to excel as an orator, and Robert Hall testifies that "though his words might be fire within, the moment they left his lips they froze and fell down at his feet." As a writer his most characteristic quality is his searching discernment of every kind of moral falsity and weakness, the dark and subtle windings of which he tracks with unerring and dogged sagacity, and exposes either with easy irony, or with a keen and scathing satire, whose indignation, however, is slightly qualified by a faint suggestion of sorrowful contempt. He often strangely interweaves the hackneyed and commonplace with the novel and unexpected. The substance of his thought is old and worn, but after passing through the crucible of his mind it acquires a brilliant lustre, and he places it in such new and striking lights that his exhibition of it resembles the revelation of something hitherto unknown. He is, however, so intent on adequately representing the minutest aspects of his subject that he does not sufficiently distinguish between the important and the unimportant; and he often employs a beautiful, sometimes a sublime, figure to illustrate either an almost self-evident proposition, or a thought otherwise much too lowly for such a splendid dress; while, on the other hand, an elevated thought or sentiment is sometimes associated with imagery as much out of harmony with its surroundings and position as would be the rags of a beggar with the splendor and magnificence of a court. His originality consists chiefly in placing old and time-honored beliefs in new and unexpected relations, and imparting a vividness to truths which are so generally recognized that their importance is almost forgotten. He has therefore given no new impulse to thought, and he has scarcely entered upon the threshold of the speculation and ideas of the 19th century. Though his intellectual was much wider than his moral sympathy, his literary criticisms—apart from the fact that they are totally unfettered by artificial rules and maxims, and record in ingenuous language the actual impression produced upon his mind by the work he examines—are chiefly of value for their keen detection of what is hollow and false in sentiment, and their sarcastic exposure of affectation and pretence. He wrote with intense mental strain and effort, and sometimes spent days in the elaboration of a single paragraph. His style has the merit of entire individuality; as he himself says, his "language is simply and absolutely formed for the thought—is adapted and flexible to it—is taken out of the whole vocabulary of our tongue just on purpose for the thoughts, and moulded to their very shape, with an almost perfect independence and avoidance of all the set artificial forms of expression." With this merit, however, it has the defects formerly adverted to; and while scarcely ever weak or ambiguous, but even in the midst of its frequent involutions surprising by terse and pointed or vivid and graphic interpolations, and preserving throughout its winding structure a compact, nervous, and sinewy strength which occasionally assumes the form of a rhythmical and measured eloquence, it is yet on the whole deficient in directness, freedom, ease, and grace.

Besides the works already alluded to, Foster is the author of a *Discourse on Missions*, 1818; "Introductory Essay" to Doddridge's *Rise and Progress of Religion*, 1825; "Observations on Mr. Hall's Character as a Preacher," prefixed to the collected edition of Hall's *Works*, 1832; an "Introduction" to a pamphlet by Mr. Marshman on the Serampore Missionaries; several political letters to the *Morning Chronicle*, and contributions to the *Eclectic Review*, published posthumously in 2 vols., 1844. His *Life and Correspondence*, edited by J. E. Ryland, originally published in 1846, has passed through several editions.

(T. F. H.)

FOSTER, STEPHEN COLLINS (1826–1864), a prolific American song and ballad writer, was born at Alleghany, Pennsylvania, July 4, 1826. He was the youngest child of a merchant who became mayor of his native city, and a member of the State legislature, and was related by marriage to President Buchanan. As a boy Stephen was delicate, and through life he was of a quiet, retiring disposition—in strong contrast with the spirit of many of his most popular songs. He early showed talent for music, and played upon several instruments; he also acquired a fair knowledge of French and German. When thirteen years old he wrote a song afterwards published in his works —"Sadly to Mine Heart Appealing." At sixteen he wrote the then much admired "Open thy Lattice, Love;" at seventeen he entered his brother's business house, Cincinnati, Ohio, where he remained about three years, composing meanwhile such popular pieces as "Old Uncle Ned," "O Susanna!" etc. For the latter he received 100 dollars, which induced him to adopt song-writing as a vocation. His chief successes were songs written for the negro melodists or "minstrels." Besides those mentioned, the following attained great popularity, viz., "Nellie was a Lady," "Old Kentucky Home," "Old Folks at Home," "Massa's in the Cold Ground," etc. For these and other songs the composer received considerable sums, "Old Folks at Home" bringing him, it is said, 15,000 dollars. For the most of his songs Foster wrote both words and music. His reputation rests chiefly on his negro melodies, many of which have been popular on both sides of the Atlantic, and sung in many tongues. His later songs were of a more refined and somewhat higher order of musical composition, and after his mother's death were characterized by melancholy. Among these are "Old Dog Tray," "Gentle Annie," "Willie, we have missed you," etc. His "Come where my Love lies Dreaming" is considered one of the most pleasing and popular vocal quartets ever written. Composers and poets of celebrity recognized his peculiar talent, and great musicians incorporated many of his melodies into concert fantasias. Although as a musician and composer Foster would, strictly speaking, have little claim to high rank, his song-writing made an epoch in popular music of a class which certainly possessed melody united to beauty of harmony, while to the words employed he gave fitting musical expression. He died at New York, January 13, 1864.

FOTHERGILL, John (1712–1780), F.R.S., an eminent physician, a member of the Society of Friends, was born at Carr End in Yorkshire. He took the degree of M.D. at Edinburgh in 1736. After visiting the Continent, he in 1740 settled in London, and gained there an extensive practice. In the epidemics of influenza in 1775 and 1776 he is said to have had sixty patients daily. In his leisure he made a study of conchology and botany; and after his death, which took place in December, 1780, his collections of shells, prints, and other objects were sold for a considerable sum. Fothergill was a licentiate of the College of Physicians of London, and a fellow of that of Edinburgh, of which he was a great benefactor. He was the patron of Sidney Parkinson, the South Sea voyager. A translation of the Bible (1764 *sq.*) by Anthony Purver, a Quaker, was made and printed at his expense. His pamphlet entitled *Account of the Sore Throat attended with Ulcers* (1748, 2d ed. 1754), prepared with the assistance of information supplied by Dr. Letherland, attracted great attention, and was translated into several languages. His works were edited by Dr. John Elliot (1781), by Gilbert Thomson (1782), and by Dr. Lettsom (1783).

FOUCAULT, Jean Bernard Léon (1819–1868), a distinguished French physicist, was the son of a well-known publisher at Paris, where he was born September 18, 1819. After an education received chiefly at home, he studied medicine, which, however, he speedily abandoned for physical science, the improvement of Daguerre's photographic processes being the object to which he first directed his attention. During three years he was experimental assistant to M. Donné in his course of lectures on microscopic anatomy. With M. Fizeau he carried on a series of investigations on the intensity of the light of the sun, as compared with that of carbon heated in the voltaic arc, and of lime in the flame of the oxyhydrogen blowpipe; on the interference of heat rays, and of light rays differing greatly in lengths of path; and on the chromatic polarization of light. In 1849 he contributed to the *Comptes Rendus* of the Academy of Sciences, t. xxviii., a description of an electro-magnetic regulator for the electric lamp, and, in conjunction with Regnault, a paper on binocular vision. By the use of a revolving mirror similar to that used by Wheatstone for measuring the rapidity of electric currents, but having a concave mirror centred in its axis, he was enabled in 1850 to demonstrate the greater velocity of light in air than in water, and to establish the law deduced from the undulatory theory that the velocity of light in different media is inversely as the refractive indices of the media. In the same year he was created a chevalier of the Legion of Honor. For his demonstration in 1851 of the diurnal motion of the earth by the rotation of the plane of oscillation of a freely suspended, long, and heavy pendulum in an E.S.W. direction, exhibited by him at the Pantheon in Paris, and again in the following year by means of his invention the gyroscope, he in 1855 received the Copley medal of the Royal Society of London. He was also in 1855 made physical assistant in the imperial observatory at Paris. In September of that year he discovered that the force required for the rotation of a copper disc moving in its own plane becomes greater, the disc at the same time growing hotter, when the disc is made to rotate with its rim between the poles of a horse-shoe magnet. Foucault invented in 1857 the polarizer which bears his name, and in the succeeding year a method of giving to the speculum of reflecting telescopes the form of a spheroid or a paraboloid of revolution. His reflector for the great telescope in the Paris observatory was mounted in June, 1859. With Wheatstone's revolving mirror he in 1862 determined the absolute velocity of light to be 298,000 kilometres (about 185,000 miles) a second, or 10,000 kilom. less than that obtained by previous experimenters. He was created in that year a member of the Bureau des Longitudes and an officer of the Legion of Honor, in 1864 a foreign member of the Royal Society of London, and next year a member of the Mechanical Section of the Institute. In 1865 appeared his papers on a modification of Watt's governor, upon which he had for some time been experimenting with a view to making its period of revolution constant, and on a new apparatus for regulating the electric light; and in the following year (*Compt. Rend.* lxiii.) he showed how, by the deposition of a transparently thin film of silver on the outer side of the object glass of a telescope, the sun could be viewed without injuring the eye by excess of light. Foucault died of paralysis, February 11, 1868. From the year 1845 he edited the scientific portion of the *Journal des Débats.* His chief scientific papers are to be found in the *Comptes Rendus*, t. xxv., 1847–lxix., 1869.

See *Revue Cours Scient.* vi., 1869, pp. 484–489; *Proc. Roy. Soc.* xvii., 1869, pp. lxxxiii.–lxxxiv.; Lissayous, *Notice historique sur la vie et les travaux de Léon Foucault*, Paris, 1875.

FOUCHÉ, Joseph (1763–1820), duke of Otranto, minister of police under Napoleon I., was born in a small village near Nantes, 26th May, 1763. He was the son of a ship captain, and at the age of nine years began the study of mathematics at the college of his native place, with the view of entering the merchant marine. That such a calling would have proved congenial to him is not very probable, and at any rate it presented so little attraction to his youthful fancy that he induced his father to consent to the abandonment of this intention, and to permit him to continue his studies at Paris under the superintendence of the principal of the Oratory. He afterwards taught successively in the colleges of Juilly, Arras, and Vendôme; and at the time of the Revolution he was *préfet des études* at Nantes. He now renounced his connection with the ecclesiastical profession, and in 1792 succeeded in being chosen one of the national deputies for Loire-Inférieure. In this capacity he made a violent speech in support of the execution of Louis XVI., without respite and without appeal to the people, taunting those who hesitated to adopt such an extreme measure with "trembling before the shade of a king." In the midst of the political chaos he determined to "ride on the whirlwind and direct the storm:" though he had little or no interest in moral speculation, he became an ardent asserter of atheism; and, though devoid of all political predilections, and actuated in his political purposes simply by a cool calculation of advantages that was seldom if ever surprised or ruffled even by the most critical contingencies, he soon manifested a zeal for republicanism which exceeded that of the wildest enthusiasts of that exceptional time. Having at the end of 1793 been commissioned to put in operation the law *des suspects* in the department of Nièvre, then one of the centres of the royalist sympathizers, he not only succeeded in completely crushing all insurrectionary symptoms, but initiated the movement for the spoliation of the churches, by which the treasury was supplied with money for the campaign of 1794; and he also further inaugurated the age of reason by suppressing the priests and causing to be inscribed on the doors of the cemeteries a sentence afterwards generally adopted for this purpose—*La mort est un sommeil éternel.* In November of the same year he was appointed, along with Collot d'Herbois, to execute the decree of the convention against the royalist city of Lyons; and here he vied with his colleague in a mania for destruction and bloodshed, inditing bombastic regrets that the mine and the guillotine did their work too slowly to accord with the impatience of the republic or to express the omnipotence of the people. This devoted enthusiasm for freedom led to his being elected president of the Jacobin Club, 4th June, 1794, soon after his return to Paris. He now so far allowed his audacity to overcome his discretion as to make some derisive allusions to the part played in the fête de l'Être Suprême by Robespierre, who on that account denounced him as an impostor and peculator, and procured his expulsion from the society. Fouché had erred, however, only by a too quick anticipation of public opinion, for the execution of Robespierre followed on the 25th July. The star of Fouché was thus for a short time again in the ascendant; but having awakened distrust by some new intrigues, he was denounced as a terrorist, expelled the convention 9th August, 1795, and placed under arrest. He obtained his freedom by the amnesty of the 26th October following; and having obtained the confidence of the socialist Babeuf, and revealed his conspiracy to Barras, then president of the directory, he was rewarded by an interest in the contracts of the army, and by being appointed in 1798 ambassador to the Cisalpine republic. Soon afterwards his intrigues against the directory of Milan led to his recall, but when the party of Barras again came into power he was appointed to the Hague. There he remained only a few months, returning to Paris to enter upon his famous career as minister of police. In this capacity he for some years exercised an influence on the internal affairs of France perhaps greater than that of any one else; and it was chiefly owing to his well-chosen measures of repression, his ready and dexterous use of expedients, his almost omniscient faculty of detection, and his just appreciation of political contingencies, that at this critical period of France's history the reign of anarchy was averted. Recognizing the necessity of a new political departure, he suppressed the Jacobin clubs and newspapers, and was concerned in instigating the beginning of a reaction towards monarchical principles. Though he failed to effect an understanding between Barras and Napoleon, he resolved rather to desert his patron than to share his overthrow, and exerted all his powers of management and finesse to bring the *coup d'état* of the 18th Brumaire to a successful termination. Besides taking an important though carefully guarded share in the preliminary negotiations, he suspended in the name of the directory the twelve municipalities of Paris, tranquillized the citizens by posting on the walls reassuring intimations, and took the precaution of shutting the gates of Paris to prevent the fugitive deputies from re-entering the city.

Under the consulate, Fouché, notwithstanding the opposition of Sieyès, was continued minister of police, partly because he was to be dreaded as an opponent, and partly because no one else could bear comparison with him in fitness for the office. Its duties he discharged, not only with unequalled tact and discretion, but with a justice and mildness rendered possible only by his perfect confidence in his superior cunning. At the same time there was necessarily attached to it a very great irresponsible power, and far from neglecting to make undue use of this he took care to lend an additional appearance of necessity and value to his services by a continual supply of political fomentations. If his audacity and assumption aroused the jealousy of Napoleon, his cool impenetrability no less disconcerted him, and matters were not improved by the ludicrous blunders of the secret police which Napoleon had the folly to employ, in order both to test his minister's fidelity and render him less indispensable. Actuated therefore most probably by a regard to his own position, Fouché endeavored to prevent a too rapid abandonment of the lines of republicanism, and deprecated as imprudent the means that were being used towards the establishment of a monarchical government. Such advices doubtless increased Napoleon's irritation and distrust, and on becoming consul for life in 1802 he determined to rid himself of the galling fetters of his minister's ascendency. He did this, however, with great caution and respect; and while he suppressed the office as no longer necessary, he conferred on Fouché the dignity of a senator, and presented him with half the police reserve funds. The association of the functions of the old office with those of the ministry of justice did not prove a happy arrangement; and Fouché, by maintaining for his own purposes the same system of espionage as formerly, was able, by revealing the Georges conspiracy, to reassert his influence in the affairs of state. Divining Napoleon's secret wishes and intentions, he now took every opportunity to press upon him the advisability of immediately assuming the monarchical crown, and applied himself to the furtherance of this object with an ostentatious zeal that was doubtless meant to suggest that he was almost the sole agent in determining events towards that end. And indeed he might, after Napoleon, justly claim the chief merit of that great political change, for at any rate the smoothness with which it was accomplished was greatly due to Fouché's skilful management.

After Napoleon's coronation Fouché was therefore reinstalled in his old office, 4th July, 1804, uniting with its functions those of the ministry of the interior. In this position he took a very prominent part in the rule of France under Napoleon, and to some extent rivalled his master in influence; for if the empire gained glory by Napoleon's achievements, it owed its internal harmony to Fouché, who had for a time the entire direction of its administration. On the revival of the titles of nobility he was created duke of Otranto, and it appeared as if his tenure of office were indissolubly connected with the empire's stability. The bond between him and the emperor was, however, solely one of interest, and the very antipodes of one of affection and mutual esteem. His imperturbable self-control, his connection with the old republicans, the obscurity and mystery in which he shrouded his intentions, and his power of secret strategy gained him almost a kind of mastery over the arbitrary spirit of Napoleon, but it was a mastery borne both with impatience and with resentment. Apart from this, his cold and vulgar ambition and his cynical contempt for all unsubstantial glory irritated the sensitive egoism of Napoleon, whose magnificent projects he often pierced with shafts of truth that were too painfully effective, and whom he somewhat imprudently tormented with warnings as to the necessity of limiting his designs of conquest. When matters were in this critical condition, they were brought to a crisis by a proclamation of Fouché calling on France—then threatened by the English invasion—to prove that Napoleon's presence was not necessary to scatter his enemies. The proclamation was effectual; but on Napoleon's return to Paris Fouché was deprived of the ministry of the interior. Shortly afterwards he sent an agent to England to carry on negotiations with the English Government, in ignorance that Napoleon had sent another for the same purpose; and the English minister, suspecting a trick, declined all further negotiations. This mischance completed Fouché's disgrace; he ceased to be minister of police, 3d June, 1810; and to secure his absence from France, he was appointed governor of Rome. While delaying his departure he was requested to deliver up the autograph letters of Napoleon and other Government documents in his possession; and his answer that they were all destroyed was deemed so little satisfactory that he found it expedient to go into voluntary exile. On delivering up the papers the destruction of which he had asserted, he was afterwards permitted to return to his estate at Pont-Carré; but in 1813 Napoleon judged it prudent to appoint him governor of Illyria, after which he was sent to Rome to watch the movements of Murat. Being recalled to France some time before the entrance of the allies into Paris, he in anticipation of events came to an understanding with Talleyrand, and becoming one of the principal members of the provisional Government, proposed that a deputation should be sent to the Comte d'Artois, brother of Louis XVIII. He afterwards wrote letters to the king recommending the adoption of certain measures fitted to reconcile the opponents of the Bourbon dynasty, and on the 25th April addressed a letter to Napoleon at Elba, advising him, instead of making an effort to remount the throne of France, to seek a sphere for his ambition in America, "where his genius would be admired without being feared." On the news of Napoleon's escape from Elba the Government of Louis offered Fouché the portfolio of police, but he declined it on the ground that the Government could no longer hold its position. Next day he was ordered to be arrested, but deluding by a clever stratagem the officers sent for that purpose, he escaped to the hôtel of Hortense Beauharnais, and received on the following day his old office from the hands of Napoleon. He now determined merely to prepare for Napoleon's downfall, which he saw to be imminent; and besides securing the confidence of both patriots and royalists, he opened a communication with the allies. After the battle of Waterloo it was therefore to him that all eyes turned for guidance; and, becoming the head of the provisional Government, he succeeded in producing the impression that his skilful diplomacy had saved Paris from extreme humiliation. Having played such an important part in this political crisis his name could not be omitted from the list of the new Government, and he received his old office from the king, of whose brother's death he had been one of the principal instigators. His dexterity, however, had now set itself a task for which it was incompetent; and gradually finding his position untenable, he resigned office 19th September, 1815. As a kind of solatium he was appointed ambassador to Dresden; but on the passing of the law of banishment against those who had voted for the death of Louis XVI., he retired to Prague. He became a naturalized Austrian subject in 1818, and died at Trieste, 25th December, 1820, in possession of enormous wealth.

Fouché, notwithstanding his equivocal expression of countenance and his known untrustworthiness, had a peculiar faculty of captivating the eminent politicians with whom he came into contact. This was due at once to his instinctive divination of their weak point, and to his wonderful knowledge of the varying conditions of the political barometer. Though somewhat boastful, his conversation was remarkably agreeable and interesting, and was frequently lighted up by terse and sarcastic witticisms which would have done credit to Talleyrand. His temperament was too cold to enable him to achieve success as an orator, but his writings, though sometimes bombastic, must be allowed the merit of cleverness, and are often characterized by a graphic felicity. His unparalleled political career is to be accounted for not perhaps so much by his peculiar intellectual abilities as by the apparent fact that he was, as M. Thiers has expressed it, completely "indifferent to good and evil"—that he was influenced neither by the impulses of passion nor by the dictates of conscience. His private life was virtuous compared with that of many of his contemporaries, and his political life—apart from his connection with the death of Louis XVI., and the atrocities of Nantes and Lyons—was not only unstained by heinous crime, but to an unenlightened spectator seemed wholly devoted to the public interest. Inhabiting a region beyond the influence of party bias, he appeared when a political crisis was at hand almost in the character of the guardian angel of France, cherishing no remembrance of past ingratitude, but benevolently proffering for her acceptance the only aid that could save her from disaster. He was, if not the leading actor, at least the principal wire-puller and prompter in many of the great events of his time; but his only important legacy to posterity is the grand spy-system which he brought almost to perfection, and which has since exercised such a baneful influence on European politics. Next to his love of intrigue, his main motive in all his purposes was something resembling avarice; but in all probability he did not love even money, and sought to lay hold of it chiefly as the one stable rock amid the billows and quicksands of political life. Though his purposes were not held in check by any moral principle, yet so strong was his self-control, and so calm his estimate of possibilities, that he never committed himself irrevocably to a conspiracy that was not successful. The atrocities, however, which inaugurated his political career, and at the close of it his acceptance of office under Louis XVIII., were, though widely separated in time, so incompatible with each other that he at last completely lost the confidence of all parties in the state, and his past career was placed in a light so strongly sinister as to render its character unmistakable. Many politicians of his own time had been guilty of equally heinous crimes; but few of any age have so consistently and uninterruptedly sacrificed every political and moral consideration, including that of self-respect, to a temporary success.

Fouché is the author of *Réflexions sur le jugement de Louis Capet*, 1793; *Réflexions sur l'éducation publique*, 1793; *Rapport et projet de loi relatifs aux colléges*, 1793; *Rapport sur la situation de Commune-Affranche*, 1794; *Lettre aux préfets, concernant les prêtres, etc.*, 1801; two *Rapports aux Roi* and *Notes aux ministres étrangers*, 1815, where he ably discusses the condition of France at the time; and *Lettre au duc de Wellington*, 1817. He is said to have been the author of the *Précis de la vie publique du duc d'Otrante*, published at London and Leipsic in 1816. The *Mémoires de Fouché*, Paris, 1824, were declared by his family to be a forgery, but although their naïveté is often too pronounced to be compatible with their authenticity, they are evidently founded on original sources of information. See also *Vie de Fouché*, 1821; Bourrienne, *Life of Napoleon;* Desmarest, *Témoignages historiques, ou quinze Ans de haute police sous Napoléon*, 1833; Martel, *Étude sur Fouché et sur le communisme dans le pratique en 1793*, 1873, which contains a number of documents never before published; and an interesting account of an interview with Fouché by Earl Stanhope, in Lord Brougham's collected works, vol. v. (T. F. H.)

FOUCHER, Simon (1644–1696), a sceptical writer during the latter part of the 17th century, was born at Dijon on the 1st March, 1644. Extremely little is known of his life. He was the son of a merchant at Dijon, and appears to have taken orders at a very early age. For some years he held the position of honorary canon at Dijon, but this he resigned in order to take up residence in Paris. He graduated at the Sorbonne, and spent the remainder of his life in literary work in Paris. Foucher's name is now almost completely forgotten, but in his day he enjoyed considerable repute as a keen opponent of Malebranche. His point of view in philosophy may be called the sceptical, but the scepticism extends to only one doctrine, external perception. On this point he revived the old arguments of the Academy, and advanced them with much ingenuity against Malebranche's doctrine. Otherwise his scepticism is subordinate to orthodox belief, the fundamental dogmas of the church seeming to him intuitively evident. His writings against Malebranche were collected under the title *Dissertations sur la Recherche de la Vérité*, 1693. See Rabbe, *L'Abbé Simon Foucher*, Dijon, 1867.

FOUGÈRES, a town of France, at the head of an arrondissement in the department of Ille-et-Vilaine, situated for the most part on an eminence near the left bank of the Nançon, a tributary of the Couesnon, by which the lower town is not unfrequently laid under water. It was formerly one of the strongest places on the frontier towards Normandy, and it still preserves some portions of its 15th-century walls. The castle is now a picturesque ruin, with abundant evidence in its noble towers and outworks at once of its strength and its magnificence. The finest of all the towers was erected in 1242 by Hugues of Lusignan, and named after Melusine the mythical foundress of the family. The churches of St. Léonard and St. Sulpice both date, at least in part, from the 15th century; and the town-hall has a gate of the 16th and a belfry tower of the 15th. Among the other public buildings are a hospital founded in 1688, a civil and military prison, an institution for deaf mutes, an orphanage, and a normal school. The trade and manufactures of the town are considerable—the former consisting mainly of agricultural and dairy produce, and the latter of shoes and boots, sail-cloth and other hempen fabrics, flannel, hats, and leather. Fougères frequently figures in history from the 11th to the 15th century. It was taken by the English in 1202, and again in 1448; and the name of Surienne, the captor on the second occasion, is still borne by one of the towers of the castle. Population in 1851, 8771; in 1876, 10,396.

FOULD, Achille (1800–1867), French financier and politician, was born at Paris, November 17, 1800. The son of a rich Jewish banker, he was associated with and afterwards succeeded his father in the management of the business. As early as 1842 he entered political life, having been elected in that year as a deputy for the department of the Hautes Pyrénées. From that time to his death he actively busied himself with the affairs of his country. He readily acquiesced in the revolution of February, 1848, and is said to have exercised a decided influence in financial matters on the provisional Government then formed. He shortly afterwards published two pamphlets against the use of paper money, entitled, *Pas d' Assignats!* and *Opinion de M. A. Fould sur les Assignats.* During the presidency of Louis Napoleon he was four times minister of finance, and took a leading part in the economical reforms then made in France. His strong conservative tendencies led him to oppose the doctrine of free trade, and disposed him to hail the "Coup d'État" and the new empire. On the 25th of January, 1852, in consequence of the decree confiscating the property of the Orleans family, he resigned the office of minister of finance, but was on the same day appointed senator, and soon after rejoined the Government as minister of state and of the imperial household. In this capacity he directed the Paris exhibition of 1855. The events of November, 1860, led once more to his resignation, but he was recalled to the ministry of finance in November of the following year, and retained office until the publication of the imperial letter of the 19th of January, 1867, when M. Émile Olivier became the chief adviser of the emperor. During his last tenure of office he had reduced the floating debt, which the Mexican war had considerably increased, by the negotiation of a loan of 300 millions of francs (1863). Fould, besides uncommon financial abilities, had a taste for the fine arts, which he developed and refined during his youth by visiting Italy and the eastern coasts of the Mediterranean. In 1857 he was made an honorary member of the Academy of the Fine Arts. He died at Tarbes on the 5th October, 1867.

FOULIS, Andrew and Robert, two learned Scotch printers and publishers, whose enterprise and devotion to the interests of the higher education deserve to be gratefully remembered. Robert, the elder of the two, was born in 1707, and his brother in 1712. Their father was a maltman in Glasgow, and they consequently had very ordinary opportunities for intellectual culture in their early years. Robert was apprenticed to a barber; but his ability attracted the attention of Dr. Francis Hutchison, who strongly recommended him to establish a printing press. After spending 1738 and 1739 in England and France in company with his brother Andrew, who had been intended for the church and had received a better education, he started business about 1740–1, and in 1743 was appointed printer to the university. In this same year he brought out Demetrius Phalereus, the first Greek book ever printed in Glasgow; and this was soon followed by the famous 12mo edition of Horace, which was long but erroneously believed to be immaculate: though the successive sheets were suspended in the university and a reward offered for the discovery of any inaccuracy, six errors at least, according to Dibdin, escaped detection. Soon afterwards the brothers entered into partnership, and they continued for about 30 years to issue carefully corrected and elegantly printed editions of classical works in Latin, Greek, English, French, and Italian. Upwards of 500 separate publications proceeded from their press—among the more noticeable being the small editions of Cicero, Tacitus, Cornelius Nepos, Virgil, Tibullus and Propertius, Lucretius, and Juvenal; a beautiful edition of the Greek Testament in small 4to; Homer, 4 vols. fol., 1756–1758; Herodotus, Greek and Latin, 9 vols. 12mo, 1761; Xenophon, Greek and Latin, 12 vols. in 12mo, 1762–1767; Gray's Poems; Pope's Works; Milton's Poems. The brothers spared no pains, and Robert went to France to procure manuscripts of the classics, and to engage a skilled engraver and a copper-plate printer. Unfortunately it became their ambition to establish an institution for the encouragement of the fine arts; and though one of their chief patrons, the earl of Northumberland, warned them to "print for posterity and prosper," they spent their money in collecting pictures, pieces of sculpture, and models, in paying for the education and travelling of youthful artists, and in copying the masterpieces of foreign art. Their countrymen were not ripe for such an attempt, and the "Academy" not only proved a failure but involved the projectors in ruin. Andrew died in 1775, and his brother went to London, hoping to realize a large sum by the sale of his pictures. They were sold for much less than he anticipated, and he returned broken-hearted to Scotland, where he died at Edinburgh in June, 1776. The debts of the firm amounted to £6500. Robert was the author of a *Catalogue of Paintings with Critical Remarks*, 3 vols.

See W. J. Duncan, *Notices and Documents illustrative of the Literary History of Glasgow*, printed for the Maitland Club, 1831, which *inter alia* contains a catalogue of the works printed at the Foulis press, and another of the pictures, statues, and busts in plaster of Paris produced at the "Academy" in the university of Glasgow.

FOUNDING, the art of reproducing solid objects in metal or other fusible substances by pouring the melted substance into moulds. It is also known as *casting*, and objects so produced are said to be of cast metal. Works where founding or casting is carried on are termed foundries, and their proprietors founders. The verb to found is not, however, in current use, being almost entirely replaced by cast. The root of the word is the Latin *fundus*.

Three principal operations are involved in founding:—(1) moulding, or the production of a hollow mould to receive the melted metal; (2) melting, or running down the metal; and (3) pouring, or filling the mould with the liquid metal. The preparation of the original object or pattern from which the mould is made is not strictly part of foundry work proper, the founder receiving the pattern prepared in wood from the original drawings from the engineer's patternmaker, except in those cases where no pattern is required, and the model is built up on the foundry floor by the moulder by the use of revolving templates, dividing engines, or other contrivances.

The metals best suited for foundry work are those that possess the property of increasing in volume at the moment of passage from the liquid to the solid state, so that its particles may be pressed into and fill up the finest cavities of the mould in setting. This property is best developed in bismuth, the alloys of copper with tin and zinc (bronze and brass), and cast iron. Lead does not take a sharp impression unless alloyed with tin or antimony, as in type metal. Copper also does not give sound castings.

Patterns for moulding require to be made somewhat larger than the cast required, the difference being determined by the linear dilatation of the metal between the ordinary temperature and that at the moment of solidification. This varies for different metals; for cast iron it is about $\frac{1}{96}$; for hard bronze, $\frac{1}{63}$; soft bronze, $\frac{1}{134}$; brass, $\frac{1}{65}$; zinc, $\frac{1}{62}$; lead, $\frac{1}{92}$; tin, $\frac{1}{147}$; and bismuth, $\frac{1}{265}$. Patterns for iron founders are therefore made larger than the finished size required in the proportion of one-eighth of an inch to the foot in their linear measurement, an allowance known as "shrinkage"—the patternmaker's rule being longer by that quantity than the ordinary engineer's rule. Patterns are usually made of wood, except when the object is intended to be reproduced in great numbers, when brass or iron ones are often used. The more easily fusible alloys, such as pewter, type metal, Britannia metal, etc., are cast in metallic (iron or brass) moulds, which are used indefinitely; but with metals having a higher melting point, a separate mould is required for each cast, metal moulds being only used with these, for the production of ingots or masses that are brought to shape by other means, or when a special quality of surface is required, as in chill casting.

In most cases castings are hollow, the thickness being determined by the empty space included between the mould proper which represents the external surface of the object, and a false mould or core, which may also reproduce a finished surface, as in cylinders, pipes, etc., or be rough and uneven, as in statuary castings, where only the external surface is exposed. The material generally used in moulding from patterns is fine sand, either "green," *i.e.*, slightly damp, or dry, that is, dried by artificial heat—the first method being adopted for all castings of moderate size and weight, while dry sand mouldings are chiefly used for heavy castings where great solidity and strength are required.

The principal requisites of a good foundry sand are fine and uniform grain, a certain amount of cohesiveness without being sticky, infusibility at the temperature of the metal poured, and freedom from combustible or other substances giving off gases when heated. These are best fulfilled by a nearly pure quality of siliceous sand, with at most 3 or 4 per cent. of clay and a slight proportion of hydrated peroxide of iron; the particles when moulded should allow free passage for gases to escape, while perfectly impermeable to the melted metal. Good foundry sands are easily procured in most parts of the United Kingdom, the best being those obtained from reconstructed sandstones in the alluvia of the Thames and other large rivers, and the drift of the New Red Sandstone districts of central England. In other countries not so well provided, foundry sands are often imported or brought from considerable distances inland.

The same sand is used continuously,—the moulds after use being emptied into a pit in the foundry floor, whence the supply for new moulds is taken as required. Fresh sand is added from time to time to make up the waste and to maintain the required plasticity, which diminishes by constant heating. A proportion of ground coal or charcoal is mixed with the sand, so that, although the latter is actually red or brown when fresh, it is reduced to a dark gray or black in the foundry.

The sand forming the mould is held together by an outer frame or box called a flask, as many flasks being used as there are separate parts in the mould. These are united by lugs and cotters, the top one being sometimes loaded when the object is large to prevent it moving under the pressure of the fluid metal. A proper division of the mould is one of the chief points to be attended to in foundry work; where the object is divisible by a central plane into two equal and similar halves, two flasks are usually sufficient; but in complex and irregular forms three, four, or even a larger number are required, its divisions being so arranged that no portion of the pattern overhangs within any section, so that it may be withdrawn by a straight pull without shaking the sand.

The ordinary operation of moulding is as follows. A flask laid with its lugs uppermost is rammed up with old sand to a smooth surface. In this the lower half of the pattern is imbedded, and the surface is covered with dry or facing sand to prevent adhesion. Upon this a second flask is placed, and sand is carefully rammed upon the pattern until the box is completely filled, when the whole is turned over, and the first or false part is emptied, the surface of the upper half smoothed down or faced with sand or finely ground coal or charcoal, and a runner stick, which forms the passage or ingate for the metal, inserted. The second half is then similarly moulded in a second flask, and when finished the upper box is lifted by a crane, leaving the pattern in the lower one or *drag*, from which it is lifted by spikes or rods screwed on temporarily, a slight vibrating motion being set up by striking it rapidly with a piece of wood or iron in order to start it more easily. This is an operation of some nicety, as the blows must be moderate so as not to risk injury to the sand. Provision is made for the exit of gases by piercing vent holes through the sand by a fine wire during ramming. The surface of the mould is finished by dusting it over with charcoal or graphite.

In moulding railway chairs and similar objects of an irregular form required in great numbers, metal patterns are used with loose pieces united by spikes and dove-tails for the overhanging parts, such as the inner faces of the jaws,—the joints being so arranged that the straight parts of the pattern may be withdrawn, leaving the loose parts behind in the mould, whence they are afterwards removed by hand. Fig. 1 represents in section an arrangement of this kind, as applied to moulding railway chairs. The right-hand figure shows the pattern in place with the sand rammed, and the left the mould with the pattern D withdrawn, the loose jaws or "core prints" *a*, *b*, *c*, remaining in the sand, but in such a position as to be easily removed when the flask is turned over. The pattern is withdrawn by a straight pull on the handle H. The stop P gives support to the cores, etc., which represent the trenail holes in the finished casting (fig. 2), and prevent them being dragged away with the pattern, as they might be if left unsupported. The regular descent of the pattern is ensured by the deep sides A and the guides they move in. Usually four patterns are fixed upon one table, so that four chairs are moulded at one operation, the withdrawal of the pattern being effected by lowering the table by a hydraulic press or other mechanical arrangement. The lower mould forming the base of the chair is a nearly flat plate moulded in another machine.

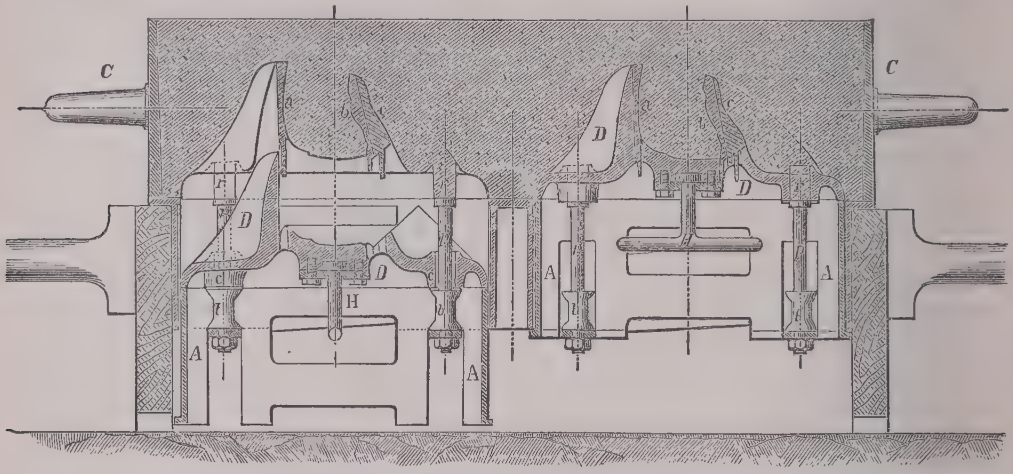

Fig. 1.—Arrangement of Patterns in casting Railway Chairs.

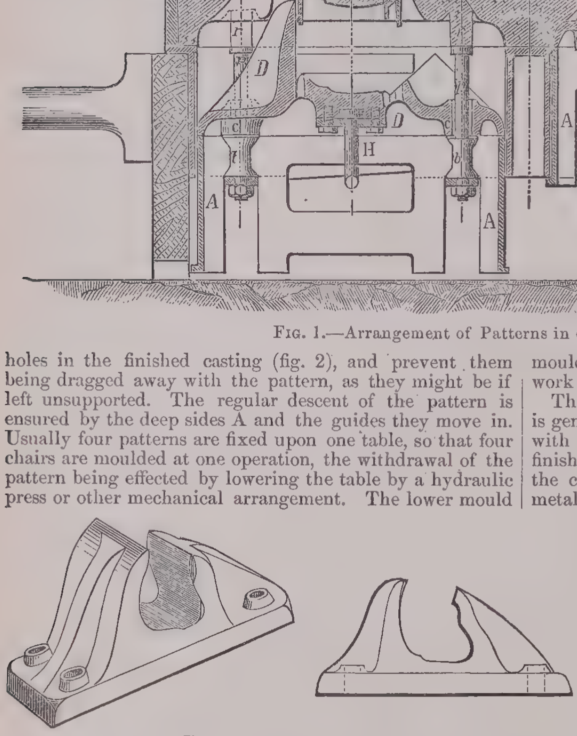

Fig. 2.—Finished Castings.

In loam moulding, as used for large pipes or cylinders, a hollow core of iron or brick is placed in the centre of the foundry, and around it a layer of loam, that is, a mixture of sand and clay rendered plastic by mixture with water, is laid on by trowels and finished up by a revolving template working round a central vertical spindle to the dimension of the interior, forming the "nowel" or core, which when dried is washed with finely ground charcoal and water. Upon this a loam pattern is made up by another template representing the outer surface of the cylinder to the thickness of the finished work. This in like manner is dried and black-washed, and finally a shell of brickwork is built outside, leaving a few inches space between it and the second moulded surface, which is carefully filled up with loam, and forms the "cope" or mould proper. This when dried is lifted by a crane, and either separates from the pattern or "thickness" or drags it away with it, but in either case the latter is broken away, and when the cope is replaced the mould is ready for use as soon as the necessary air-vents, ingates, runner passages, etc., have been provided. In many large foundries, however, gas and water pipes of large size are now produced from permanent moulds of cast iron faced with a thin layer of sand or loam; the outer moulds, being divided into two parts, are brought up to the work and removed by trucks running upon railways.

The method of moulding for bell-founding and statuary is generally similar in principle to that of a loam moulding, with this difference, that the thickness representing the finished object is made up not of loam but of wax, and in the case of statuary, where the object is to use as little metal as possible, it is usually very thin. A plaster cast divided into sections, taken from the original work, forms the matrix within which the wax is moulded of the proper thickness, the inside core being formed of clay with some metal bars to give support, when the work is large. When the plaster mould is removed, the waxen surface is finished up by the sculptor, and the outer mantle or mould proper is formed by coating it with a porous clay mixture. This when dried is carefully baked or burned in a furnace, and the wax melting at the same time leaves the hollow to receive the metal. It is sometimes necessary to leave holes in the casting to allow of the withdrawal of the surface; these are afterwards stopped with plugs of the same metal. Great care is required in the placing of the ingates and runners so as to allow the mould to be regularly and rapidly filled, and prevent any part of the metal setting or chilling before the proper moment.

Melting.—This may be effected either with or without contact with the fuel. In the former case the metal is charged alternately with coke, and occasionally a little flux, into a cylindrical or slightly conical blast furnace known as a cupola, and accumulates in a hollow or sump at the bottom below the tuyeres or blast pipes, whence it is tapped out from time to time, either directly into the mould or more generally into a ladle, for conveyance to the moulds arranged upon the foundry floor. In the second case the fusion takes place either upon the bed of a reverberatory furnace or in crucibles in air furnaces heated by coke or by gaseous fuel. Of these methods the first or cupola is only fitted for iron founding, the reverberatory furnace is used for bronze and iron, and in special forms for steel; while crucible melting is most general for brass and bronze small castings, as well as for the finer kinds of steel, or generally for any metal that is likely to be altered by direct contact with the fuel. The description of these appliances belongs more properly to the article Furnace. The founder's ladle or "shank" is a bucket or cup-shaped vessel of wrought iron lined with a shell of fire-clay, with a lip for pouring, having two projecting handles. One of these is straight and serves as a pivot; the other with a cross bar called a crutch is used as a tipping handle when pouring. When of small size the filled ladle can be carried from the cupola to the work and poured by two men, but when of large size containing several tons of metal they are slung from a crane and tipped by a tangent screw and worm wheel, manipulated by a man standing at a distance. The perfection of ladle arrangement is to be seen in Bessemer's process of steel making, where several tons of melted steel are distributed into a ring of ingot moulds in a circular pit by two or three men in a very few minutes. In Krupp's arrangements for making large steel castings from crucibles an intermediate or equalizing ladle is used. The crucibles, which contain about 70 ℔ each, are drawn from the furnaces in regular order, and poured in such a manner that an uninterrupted stream of metal is kept up from the ladle to the mould.

Large castings when filled from above are liable to be spongy or unsound in the upper part of the mould, or that last filled. In such cases an extra length is given at the top of the mould, as the unsound portion or dead-head is afterwards removed. This plan is usually followed in casting bronze guns. Sound and dense castings can be obtained by filling with a vertical side runner, so that the metal enters the mould from below and solidifies under the hydrostatic head represented by the vertical height of the runner. A method employed by Sir Joseph Whitworth, of applying hydraulic pressure to the metal in the mould until it solidifies, has been adopted with great success by the inventor in the prevention of blow holes and similar imperfections in steel ingots.

In "chill casting" a portion of the surface of the whole or a part of the mould is made of cast iron, so that the metal brought in contact with it is rapidly cooled. It is adopted in the production of Palliser's cast iron projectiles for penetrating armor plates, rolls for boiler and other iron plates, and paper glazing, and in America for hardening the treads of railway wheels. The iron where in contact with the chill surface becomes white, of a platy crystalline structure, and intensely hard, while such portions as are cooled in contact with the sand remain finely granular, dark gray, and comparatively soft. (H. B.)

FOUNDLING HOSPITALS are intended to save children from death by exposure, and it is therefore difficult to describe them properly apart from the general subject of infanticide. This practice was extremely common among nearly all ancient nations. It may still be studied in such horrible institutions of savage life as the Areoi of the Society Islands, or the Meebra of New South Wales; and it may be found in the greatest variety of form among the tribes of Hindustan.[1] The motives which suggested the practice were sometimes superstitious, more often extremely practical. As the natives of Gujarat said to Major Walker, "Pay our daughters' marriage portions, and they shall live." The feeling here was one of social dignity mixed with the strong contempt which many savages express for the single life. But in most cases children were killed simply because the parents, having no realized wealth, did not expect to be able to clothe and feed them. This is especially seen in the frequent killing of female children and those who are sick or deformed. In some places the practice has been confined to the children of concubines, of stranger fathers, or of mothers dying from sickness. In the earliest society the right to kill belonged to the father, sometimes assisted by a person skilled in omens, or by a council of friends. But the usage soon hardened into a binding custom or into express legislation. Thus in the exogamous communities girls were clearly a source, not of weakness only, but of danger. At a much later period the number of a family, or of the daughters, was often fixed by law, and both Lycurgus and the Roman decemvirs directed the slaughter of deformed children. This violence to the domestic affections was probably made easier by the notion which appears in Greek science and in Roman law that neither the fœtus nor the newly-born child is entitled to the privileges of humanity. The Greek pastoral of Longus (*The Loves of Daphnis and Chloe*), and the *Heautontimorumenos* of Terence, show still better than the text of laws how the conscience of a civilized society reconciled itself to such cruelties. And the sober reasoning of Aristotle (*Republic*, vii. c. 16) goes even beyond the custom of his time. Pliny the elder defends infanticide as a necessary check on population, and Quintilian and Seneca bear witness to the frightful mortality among children exposed, and the systematic mutilation of those who survived. Notwithstanding the eloquent protests of the Christian fathers, it was not till the time of Severus and Caracalla that a Roman lawyer ventured to make the noble statement, "Necare videtur non tantum is qui partum perfocat, sed is qui abjicit et qui alimonia denegat, et is qui publicis locis misericordiæ causa exponit quam ipse non habet."[2] The legislation of Constantine did not go beyond a declaration that the killing of a son was parricide, but the famous law of Valentinian, Valens, and Gratian (unusquisque suam sobolem nutriat, C. viii. 52, 2) punished exposure by the loss of the *patria potestas*, and secured the rights of the foster-father. Finally, by Novel 153, Justinian declared that the foundling should no longer be the slave of the foster-father, but should be free. This, however, did not affect western Europe, where social disorder and the recurrence of famine led to extensive sales of children. Against this evil, which was noticed by several councils, the church provided a rough system of relief, children being deposited (*jactati*) in marble shells at the church doors, and tended first by the *matricularii* or male nurses, and then by the *nutricarii* or foster-parents.[3] Nothing is known of the brephotrophia which are said to have existed in the Eastern empire at this time nor of the public tables (such as Velleiana, Bœbiana) which particular emperors are said to have provided for the support of children. The earlier traditions of a hospital at the Cynosarges in Athens and at the Columna Lactaria in the vegetable market at Rome are disputed. It is in the 7th and 8th centuries that definite institutions for foundlings are established in such towns as Trèves, Milan, and Montpellier. In the 15th century Garcias, archbishop of Valentia, is a conspicuous figure in this charitable work; but his fame is entirely eclipsed by that of St. Vincent de Paul, who in the reign of Louis XIII., with the help of the countess of Joigny, Mme. le Gras, and other religious ladies, rescued the foundlings of Paris from the horrors of a primitive institution named La Couche (Rue St. Landry), and ultimately obtained from Louis XIV. the use of the Bicêtre for their accommodation. Letters patent were granted to the Paris hospital in 1670. The Hôtel-Dieu of Lyons was the next in importance. No provision, however, was made outside the great towns; the houses in the cities were overcrowded and administered with laxity; and in 1784 Necker prophesied that the state would yet be seriously embarrassed by this increasing evil.[4] From 1452 to 1789 the law had imposed on the *seigneurs de haut justice* the duty of succoring children found deserted on their territories. The first constitutions of the Revolution undertook as a state debt the support of every foundling. For a time premiums were given to the mothers of illegitimate children, the "enfants de la patrie." By the law of 12 Brumaire, An II., "Toute recherche de la paternité est interdite," while by art. 341 of the Code Napoléon, "la recherche de la matérnité est admise."

France.—The present laws of France relating to this part of what is called L'Assistance Publique are the decree of January, 1811, the instruction of February, 1823, the decree of 5th March, 1852, and the law of 5th May, 1869. These laws carry out the general principles of the law of 7th Frimaire, An V., which completely decentralized the system of national poor relief established by the Revolution. The "enfants assistés" include, besides orphans and foundlings proper, infants brought by their parents into the asylum, and those born in lying-in hospitals and left there by their mothers, children of persons undergoing a judicial sentence, children temporarily taken in while their parents are in the hospital, and an increasing number of children, legitimate, illegitimate, and orphans, who are supported by a system of out-door relief. The asylum which receives them is a departmental and not a communal institution. The state pays only the cost of inspection and superintendence. There remain the "home" expenses, for the nurse (nourrice sédentaire), washing and clothes; and the "out-door" expenses, which include (1) temporary assistance to unmarried mothers in order to prevent desertion; (2) allowances to the foster-fathers (pères nourriciers) in the country for board, school money, etc.; (3) clothing; (4) travelling money for nurses and children; (5) printing, etc.; and (6) expenses in time of sickness and for burials and apprentice fees. In 1868 the total cost was 11,300,171 frs., of which 2,570,171 frs. were paid by the regular foundling asylums, and 8,730,000 frs. by the departments and communes. This represented the support of 67,000 children. In 1828 there were 112,730 children supported at a cost of 9,794,737 frs. The decrease is attributed partly to out-door relief and partly to the suppression of the "tours," of which there were 235 in 1812, and only 25 in 1860. No payments are made for the children after the age of twelve. They are generally apprenticed to a peasant or artisan, and until majority they remain under the guardianship of the administrative commissioners of the department. These commissioners are about to receive a representative character, the councils of the communes and the department, the chambers of commerce, and the chief religious communities receiving a right of nomination, as well as the prefect who represents the state. The ministry of marine have a legal claim to the services of male foundlings, which is seldom exercised. The *droit de recherche* is conceded to the parent on payment of a small fee. The decree of 1811 contemplated the repayment of all expenses by a parent reclaiming a child. The same decree directed a "tour" or revolving box (*Drehcylinder* in Germany) to be kept at each hospital. These have been gradually discontinued. The "Assistance Publique" of Paris is specially provided for by the law of 10th January, 1849. The management consists of a "directeur" appointed by the minister of the interior, and associated with a representative "conseil de surveillance." The Paris Asylum for Enfants Trouvés, with a small branch at Forges, contains about 700 beds. It receives about 4200 children in the year, or nearly one-seventh of the whole annual supply in France; and the total average cost of each child for twelve years is said to be only 1500 frs. There is also in Paris (43 Rue de Journelles) a private charity called *Œuvre de l'Adoption* for the adoption of poor children and orphans. Among the better known school farms which receive children from the hospitals at very small rates of board are those of M. Fournet at Montagny near Chalon-sur-Saône, and of l'Abbé Vedey at Varaignes in the Dordogne. It is impossible here to give even a sketch of the long and able controversies which have occurred in France on the principles of management of foundling hospitals, the advantages of "tours" and the system of admission *à bureau ouvert*, the transfer of orphans from one department to another, the free communication between parent and child, the hygiène and service of hospitals and the inspection of nurses, the education and reclamation of the children and the rights of the state in their future. Reference may be made to the work of Terme and Montfalcon noticed at the end of this article.

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[1] Compare Moore on *Hindu Infanticide*, 1811, with Brown on *Infanticide in India*, 1868. In Baluchistan, where children are often drowned in milk, there is a euphemistic proverb, "The lady's daughter died drinking milk."

[2] See *Julius Paulus, sive de partus expositione et nece apud veteres*, by Gerard Noodt, 1700, criticised by Bynkershoek, *De Jure occidendi, vendendi, et exponendi liberos apud Romanos*, 1719.

[3] See *Capitularia Regum Francorum*, ii. 474.

[4] *De l'Administration des Finances*, iii. 136; see also the article "Enfant Exposé" in Diderot's *Encyclopédie*, 1755, and Chamousset's *Mémoire politique sur les Enfants*, 1757.

Belgium.—In this country the arrangements for the relief of foundlings and the appropriation of public funds for that purpose very much resemble those in France, and can hardly be usefully described apart from the general questions of local government and poor law administration. The Commissions des Hospices Civiles, however, are purely communal bodies, although they receive pecuniary assistance from both the departments and the state. A decree of 1811 directed that there should be an asylum and a wheel for receiving foundlings in every arrondissement. The last "wheel," that of Antwerp, was closed in 1860. The present law of 30th July, 1834, distinguishes foundlings born of unknown parents from infants abandoned by known parents. Of the former the cost is divided between commune and province; of the latter the cost falls entirely on the *domicile de secours*. The law of 1834 directs that the state budget shall contain an annual foundling subsidy, which is distributed among the provinces. The suppression of the "wheels" is supposed to have reduced the subsidy from 94,608 frs. to 50,000 frs. in 1873, and the number of foundlings from 7703 in 1849 to 5745 in 1860. The great mass of the foundlings are in Brabant, that is, in Brussels, which in 1872 paid out nearly 300,000 frs. on their account. In the Netherlands many of the foundlings are sent to the "beggar colonies,"—agricultural, spinning, and weaving establishments introduced in 1810 in imitation of the French *dépôts de mendicité*. They also resemble the Flemish *écoles agricoles de réforme*. (See *Des Institutions de Bienfaisance et de Prévoyance en Belgique, 1850 à 1860*, par M. P. Lentz.)

Italy is very rich in foundling hospitals, pure and simple, orphans and other destitute children being separately provided for. Piedmont has 18, making an annual expenditure of 1,084,000 frs.; Genoa has 6, with an expenditure of 350,000 frs.; Lombardy has 13, with an expenditure of 1,468,000 frs.; and the Emilia has 15, with an expenditure of 833,000 frs. In 1870 the gross expenditure in Italy on foundlings alone was 8,044,754 frs., more than twice the sum expended on pauper lunatics. The law concerning charitable works (3d August, 1862) contemplates the erection of a charity board in every commune. At present both the communal council and the provincial deputation have certain rights of control over charitable administration. (See *Della Carita Preventiva in Italia*, by Signor Fano.) In Rome one branch of the St. Spirito in Sassia (so called from the Schola Saxonum built in 728 by King Ina in the Borgo) has, since the time of Pope Sixtus IV., been devoted to foundlings. For ten years before 1869 the annual average of children admitted was 1141, of whom 382 were ascertained to be illegitimate and 300 legitimate, the rest uncertain. The average annual number of foundlings supported is 3268, the average annual deaths 981. The death-rate in the hospital is said to be 88·78; in the country at the nursing houses 12·80. The *Conservatory* is for the support of foundling girls who after passing through the hospital do not get settled in life. The whole institution costs 305,603 frs. per annum. (See *The Charitable Institutions of Rome*, by Cardinal Morichini.) In Naples the foundling hospital is called "L'Annunziata." It receives yearly about 2000 "figli della Madonna," as they are called. It must not be confounded with the more famous Albergo Reclusorio, or Seraglio dei Poveri, which is an ordinary charity for the education of children and the maintenance of infirm old persons. The chief house at Florence is called "degli Innocenti;"[1] at Genoa the "Pammatome;" at Milan, "Santa Caterina alla ruota." In Venice the Casa degli Esposti or foundling hospital, founded in 1346, and receiving 450 children annually, was recently separated from the "Riunione di Instituti Pii," and placed under provincial administration. The splendid legacy of the last doge, Ludovico Manin, is applied to the support of about 160 children by the "Congregazione di Carita" acting through 30 parish boards (deputatione fraternate).

Austria.—In Austria foundling hospitals occupied a very prominent place in the general instructions which, by rescript dated 16th April, 1781, the emperor Joseph II. issued to the charitable endowment commission. Acting under the advice of Count Boucquoy, the author of *The Neighborly Love Association*, which supplied first Bohemia and then the empire with a type of poor law administration, the emperor provided for the case of destitute children before proceeding to deal with the cases of destitute sick and infirm poor. This class of children includes, besides foundlings proper, the children born in lying-in hospitals of unmarried women, and the children of unmarried women who can show that they have been suddenly confined when on their way to the lying-in hospital, and even in some cases legitimate children whose parents are prevented by illness or other temporary cause from maintaining them, and orphans when below the age required for admission to a regular orphanage. In 1818 these foundling asylums and the lying-in houses were declared to be state institutions. They were accordingly supported by the state treasury until the fundamental law of 20th October, 1860, handed them over to the provincial committees. They are now local institutions, depending on provincial funds, and are quite separate from the ordinary parochial poor institute. Admission is gratuitous when the child is actually found on the street, or is sent by a criminal court, or where the mother undertakes to serve for four months as nurse or midwife in an asylum, or produces a certificate from the parish priest and "poor-father" (the parish inspector under the Boucquoy scheme) that she has no money. In other cases payments of 30 to 100 florins are made. When two months old the child is sent for six or ten years to the houses in the neighborhood of respectable married persons, who have certificates from the police or the poor-law authorities, and who are inspected by the latter and by a special medical officer. These persons receive a constantly diminishing allowance, and the arrangement may be determined by 14 days' notice on either side. The foster-parents may retain the child in their service or employment till the age of twenty-two, but the true parents may at any time reclaim the foundling on reimbursing the asylum and compensating the foster-parents. The enlightened principles of the rescript of 1781, with regard to the general and technical education of the children, do not seem to be carried out in practice. It is said that there are in the empire 35 foundling hospitals, receiving annually 120,000 children.

Turkey.—Under the Greek system of vestry relief, which works very efficiently at Constantinople, a large sum is spent on foundlings. There is no hospital, but the children are brought before the five members (ἐπίτροποι) of the vestry (fabrique) or parish church committee, who, acting as the *coumbaros* or god-father, board out the child with some poor family for a small monthly payment, and afterwards provide the child with some sort of remunerative work.

Russia.—Under the old Russian system of Peter I. foundlings were received at the church windows by a staff of women paid by the state. But since the reign of Catherine II. the foundling hospitals have been in the hands of the provincial officer of public charity (prykaz obshestvennago pryzrenya). The great central institutions (Vospitatelnoi Dom), at Moscow and St. Petersburg (with a branch at Gatchina) were founded by Catherine. When a child is brought the baptismal name is asked, and a receipt is given, by which the child may be reclaimed up to the age of ten. The mother may nurse her child. After the usual period of six years in the country very great care is taken with the education, especially of the more promising children. Of the 26,000 sent annually to these two houses from all parts of Russia, only 25 per cent. are said to reach majority. The hospital is still, however, a valuable source of recruits for the public service. Malthus (*The Principles of Population*, vol. i. p. 434) has made a violent attack on these Russian charities. He argues that they discourage marriage and therefore population, and that the best management is unable to prevent a high mortality. He adds: "An occasional child murder from false shame is saved at a very high price if it can be done only by the sacrifice of some of the best and most useful feelings of the human heart in a great part of the nation." It does not appear, however, that the rate of illegitimacy in Russia is comparatively high; it is so in the two great cities. The rights of parents over the children were very much restricted, and those of the Government much extended by a ukase issued by the emperor Nicholas in 1837. The most eminent Russian writer on this subject is M. Gouroff. See his *Recherches sur les Enfants Trouvés*, and *Essai sur l'histoire des Enfants Trouvés*, Paris, 1829.

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[1] For the history of the Misericordia and Bigallo (White Cock), founded by the Brothers of Mercy, see Horner's *Walks in Florence*, vol. i.

In *America* the foundling hospitals are chiefly private charities. There is a large one called the *Cuna* in the city of Mexico. The house for girls at Rio de Janeiro is once a year frequented by men in want of wives, each application being considered by the managers. In Brazil there are several houses of mercy for foundlings, and exposures are often made at the doors of private houses. The foundling asylum of the sisters of charity in New York was opened in 1869. In 1873 it received 1124 infants not three weeks old. The annual cost is 115,000 dollars. A crib is placed in the vestibule at night, and the name and date of birth are generally left with the child.

Great Britain.—The Foundling Hospital of London was incorporated by Royal Charter in 1739 "for the maintenance and education of exposed and deserted young children." The petition of Captain Thomas Coram, who is entitled to the whole credit of the foundation,[1] states as its objects "to prevent the frequent murders of poor miserable children at their birth, and to suppress the inhuman custom of exposing new-born infants to perish in the streets." At first no questions were asked about child or parent, but a distinguishing mark was put on each child by the parent. These were often marked coins, trinkets, pieces of cotton or ribbon, verses written on scraps of paper. The clothes, if any, were carefully recorded. One entry is, "Paper on the breast, clout on the head." The applications became too numerous, and a system of balloting with red, white, and black balls was adopted. In 1756 the House of Commons came to a resolution that all children offered should be received, that local receiving places should be appointed all over the country, and that the funds should be publicly guaranteed. A basket was accordingly hung outside the hospital; the maximum age for admission was raised from two to twelve months, and a flood of children poured in from the country workhouses. In less than four years 14,934 children were presented, and a vile trade grew up among vagrants of undertaking to carry children from the country to the hospital,—an undertaking which, like the French *meneurs*, they often did not perform, or performed with great cruelty. Of these 15,000 only 4400 lived to be apprenticed out. The total expense was about £500,000. This alarmed the House of Commons. After throwing out a bill which proposed to raise the necessary funds by fees from a general system of parochial registration, they came to the conclusion that the indiscriminate admission should be discontinued. The hospital, being thus thrown on its own resources, adopted a pernicious system of receiving children with considerable sums (*e. g.*, £100), which sometimes led to the children being reclaimed by the parent. This was finally stopped in 1801; and it is now a fundamental rule that no money is received. The committee of inquiry must now be satisfied of the previous good character and present necessity of the mother, and that the father of the child has deserted it and the mother, and that the reception of the child will probably replace the mother in the course of virtue and in the way of an honest livelihood. The principle is in fact that laid down by Fielding in *Tom Jones*—"Too true I am afraid it is that many women have become abandoned and have sunk to the last degree of vice by being unable to retrieve the first slip." At present the hospital supports about 500 children up to the age of fifteen. The average annual number of applications is 236, and of admissions 41. The children used to be named after the patrons and governors, but the treasurer now prepares a list. After three years in the country the children come back to town. At sixteen the girls are generally apprenticed as servants for four years, and the boys at the age of fourteen as mechanics for seven years. There is a small benevolent fund for adults. The hospital has an income of above £11,000, which will be enormously increased in 1895, when the leaseholds of the Lamb's Conduit grounds expire. From the famous chapel built by Jacobsen in 1747 the hospital derives a net income of £500. The musical service, which was originally sung by the blind children only, was made fashionable by the generosity of Handel, who frequently had the "Messiah" performed there, and who bequeathed to the hospital a MS. copy (full score) of his greatest oratorio. The altar-piece is West's picture of Christ presenting a little Child. In 1774, Dr. Burney and Signor Giardini made an unsuccessful attempt to form in connection with the hospital a public music school, in imitation of the Conservatorium of the Continent. In 1847, however, the present successful "Juvenile Band" of about 30 boys was started. The educational effects of music have been found excellent, and the hospital supplies many musicians to the best army and navy bands. The early connection between the hospital and the eminent painters of the reign of George II. is one of extreme interest. The exhibitions of pictures at the Foundling, which were organized by the Dilettanti Club, undoubtedly led to the formation of the Royal Academy in 1768. Hogarth painted a portrait of Captain Coram for the hospital, which also contains his March to Finchley, and Roubiliac's bust of Handel. Coram, the founder, was remarkable for the versatility of his public spirit. He did much for the development of Georgia and Nova Scotia. (See *History and Objects of the Foundling Hospital, with Memoir of its Founder*, by J. Brownlow, 3d ed., 1865.)

In 1704 the Foundling Hospital of Dublin was opened. No inquiry was made about the parents, and no money received. From 1500 to 2000 children were received annually. A large income was derived from a duty on coal and the produce of car licenses. In 1822 an admission fee of £5 was charged on the parish from which the child came. This reduced the annual arrivals to about 500. In 1829 the select committee on the Irish miscellaneous estimates recommended that no further assistance should be given. The hospital had not preserved life or educated the foundlings. The mortality was nearly 4 in 5, and the total cost £10,000 a year. Accordingly, in 1835, Lord Glenelg (then Irish Secretary) closed the institution.

Scotland never seems to have possessed a foundling hospital. In 1759, John Watson left funds which were to be applied to the pious and charitable purpose "of preventing child murder" by the establishment of a hospital for receiving pregnant women and taking care of their children as foundlings. But by an Act of Parliament in 1822, which sets forth "doubts as to the propriety" of the original purpose, the money was given to trustees to erect a hospital for the maintenance and education of destitute children. The fundamental difference between Scotland and most other Protestant countries on the one hand, and those Catholic countries which have adopted the Code Napoléon on the other, is that in the former proceedings for aliment may be taken against the putative father. Hence the mother is not helpless. She cannot, however, in Scotland deposit her bastard in the poorhouse, unless she herself is entitled to relief and prepared to go there; and relief is of course given only so long as the mother is not able to support herself. An infant absolutely deserted would of necessity be taken care of by the poor law authority. It is in Scotland a crime at common law to "expose" a young child to the risk of death or to any serious danger; and it is also an offence against the Poor Law Act of 1845 for either the mother or the putative father (who has acknowledged the paternity) to desert an illegitimate child. In England the offence is defined as the abandoning or exposing a child under the age of two, whereby its life is endangered, or its health is, or is likely to be, permanently injured (24 and 25 Vict. c. 100, § 27). Besides this the provisions of the Industrial Schools Acts apply to a large proportion of the cases of homeless and deserted children which in other countries might be entrusted to the foundling hospitals. And indeed the system of boarding out pauper children seems to have realized most of the advantages promised by the hospital. The disagreeable feature of the Scotch practice is the number of women who, without any feeling of shame, get a family of illegitimate children by different fathers, whom they attack in succession for aliment. The rate of illegitimacy in some Scotch counties has reached 14, 15, and 16 per cent. It is not likely, however, that the hospital principle, though cured of its worst fault, that of secret admission without inquiry,[2] will ever be received in Great Britain or Ireland. The key-note of public opinion on the question was probably struck by Lord Brougham in his *Letters to Sir Samuel Romilly on the Abuse of Charities*, and by Dr. Chalmers in his *Christian Economy of Large Towns*. The true solution, however, depends less on abstract political reasoning than on prudent management of existing institutions. In France, for instance, a great fund of practical skill in administration has been accumulated. In Great Britain the evil may be more safely left to private charity and religious effort. If fewer women fall there, there is perhaps a profounder degradation of those who do.

The following are the most important systematic works on this subject: *Histoire Statistique et Morale des Enfants Trouvés*, by MM. Terme et Montfalcon, Paris, 1837. The authors were eminent medical men at Lyons, connected with the administration of the foundling hospital. Remacle, *Des Hospices d'Enfants Trouvês en Europe*, Paris, 1838. Hügel, *Die Findelhäuser und das Findelwesen Europas*, Vienna, 1863. Emminghaus, "Das Armenwesen und die Armengesetzgebung," in *Europäischen Staaten*, Berlin, 1870. An English translation of part of this book was published in 1873, by Mr. E. B. Eastwick, M. P., in the interests of the Charity Organization Society, but it does not contain the German editor's European statistics. Some recent information may also be got in the Reports on Poor Laws in Foreign Countries, communicated to the Local Government Board by the Foreign Secretary. *Accounts and Papers*, 1875, vol. 65, c. 1225. See also the well-informed articles by MM. Esquiros and de Marisy, in vols. xiii. and liv. of the *Revue des Deux Mondes*. The references to Montesquieu, *Esprit des Lois*, xxiii. 22, and to Voltaire, *Dict. Phil.*, article "Charité," are more of literary than of practical interest. (W. C. S.)

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[1] Addison had suggested such a charity (*Guardian*, No. 3).

[2] As M. de Marisy has said, the *Enfant trouvé* exists no longer; he has been replaced by the *Enfant assisté*.

FOUNTAIN, a spring of water. The term is applied in a restricted sense to such springs as, whether fed by natural or artificial means, have arrangements of human art at a point where the water emerges. Pure water is so necessary to man, and the degree of plenty, constancy, and purity in which it is procured, transported, prepared for use, and distributed in populous districts is so fair a standard of civilization, that it hardly seems unreasonable in Pausanias to put it among the criteria, asking, with reference to Panopæus, if that can rightly be called a city which has neither ruler, gymnasium, forum, nor fountain of water. Among the Greeks we learn, mainly from Pausanias, that fountains were very common in the cities; and springs being very plentiful in Greece, little engineering skill was required to convey the water from place to place. Receptacles of sufficient size were made for it at the springs; and to maintain its purity, structures were raised inclosing and covering the receptacle.

It is not surprising that so beneficent an object as a spring of water should be connected with religious belief. It is certain that until modern times fountains have been in some way connected with the religion of the people among whom they sprang, and dedicated to one or other of its personalities. In Greece they were dedicated to gods and goddesses, nymphs and heroes, and were frequently placed in or near temples. The references to fountains by Pausanias are frequent, but he gives no full descriptions. That of Pirene at Corinth (mentioned also by Herodotus) was formed of white stone, and contained a number of cells from which the pleasant water flowed into an open basin. Legend connects it with the nymph Pirene, who shed such copious tears, when bewailing her son who had been slain by Diana, that she was changed into a fountain. The city of Corinth possessed many fountains. In one near the statues of Diana and Bellerophon, the water flowed through the hoofs of the horse Pegasus. The fountain of Glauce, inclosed in the Odeum, was dedicated to Glauce, because she was said to have thrown herself therein, believing that its waters could counteract the poisons of Medea. Another Corinthian fountain had a bronze statue of Neptune standing on a dolphin from which the water flowed. The fountain constructed by Theagenes at Megara was remarkable for its size and decorations, and for the number of its columns. One at Lerna was surrounded with pillars, and the structure contained a number of seats affording a cool summer retreat. Near Pharæ was a grove dedicated to Apollo, and in it a fountain of water. Pausanias gives a definite architectural detail when he says that a fountain at Patræ was reached from without by descending steps. Mystical, medicinal, surgical, and other qualities, as well as supernatural origin, were ascribed to fountains. One at Cyanæ near Lycia was said to possess the quality of endowing all persons descending into it with power to see whatever they desired to see; while the legends of fountains and other waters with strange powers to heal are numerous in many lands. The fountain Enneacrunus at Athens was called Callirrhoe before the time the water was drawn from it by the nine pipes from which it took its later name. Two temples were above it, according to Pausanias, one dedicated to Demeter and Proserpine, and the other to Triptolemus. The fountain in the temple of Erechtheus at Athens was supplied by a spring of salt water, and a similar spring supplied that in the temple of Poseidon Hippias at Mantinea.

Though no doubt most tribes of other than nomadic habits of life must have contrived, in their settlements, appliances of some kind for maintaining the supply of water constant and pure, very few remains of these have been found that possess any degree of architectural importance. Layard mentions an Assyrian fountain, found by him in a gorge of the river Gomel, which consists of a series of basins cut in the solid rock, and descending in steps to the stream. The water had been originally led from one to the other by small conduits, the lowest of which was ornamented by two rampant lions in relief.

The water-supply of Rome and the works auxiliary to it were on a scale to be expected from a people of such great practical power. The remains of the aqueducts which stretched from the city across the Campagna are amongst the most striking monuments of Italy. Vitruvius (book viii.) gives minute particulars concerning the methods to be employed for the discovery, testing, and distribution of water, and describes the properties of different waters with great care, proving the importance which was attached to these matters by the Romans. The aqueducts supplied the baths and the public fountains, from which last all the populace, except such as could afford to pay for a separate pipe to their houses, obtained their water. These fountains were therefore of large size and numerous. They were formed at many of the *castella* of the aqueducts (see AQUEDUCT.) According to Vitruvius, each *castellum* should have three pipes,—one for public fountains, one for baths, and the third for private houses. Considerable revenue was drawn from the possessors of private water-pipes. The Roman fountains were generally decorated with figures and heads. Fountains were often also the ornament of Roman villas and country houses; in those so situated the water generally fell from above into a large marble basin, with at times a second fall into a still lower receptacle.

To the remains of Pompeii we are indebted for much exact knowledge of Roman antiquity in its minutest particulars; and not the least interesting of the disinterred forms are those of the public and private fountains which the city possessed. Two adjacent houses in Pompeii had very remarkable fountains. "One," says Gell, "is covered with a sort of mosaic consisting of vitrified tesseræ of different colors, but in which blue predominates. These are sometimes arranged in not inelegant patterns, and the grand divisions as well as the borders are entirely formed and ornamented with real sea-shells, neither calcined by the heat of the eruption nor changed by the lapse of so many centuries" (*Pompeiana*, i. 196). Another of large size was similarly decorated with marine shells, and is supposed to have borne two sculptured figures, one of which, a bronze, is said to be in the museum at Naples. This fountain projects 5 feet 7 inches from the wall against which it is placed, and is 7 feet wide in front, while the height of the structure up to the eaves of the pediment is 7 feet 7 inches. On a central column in the piscina was a statue of Cupid, with a dove, from the mouth of which water issued. Cicero had, at his villa at Formiæ, a fountain which was decorated with marine shells.

Fountains were very common in the open spaces and at the crossways in Pompeii. They were supplied by leaden pipes from the reservoirs, and had little ornament except a human or animal head, from the mouth of which it was arranged that the water should issue. Not only did simple running fountains exist, but the remains of *jets d'eau* have been found; and a drawing exists representing a vase with a double jet of water, standing on a pedestal placed in what is supposed to have been the impluvium of a house. There was also a *jet d'eau* at the eastern end of the peristyle of the Fullonica at Pompeii.

As among the Greeks, so with the early Celts, traces of superstitious beliefs and usages with relation to fountains can be traced in monumental and legendary remains. Near the village of Primaleon in Brittany was a very remarkable monument,—one possibly unique, as giving distinct proof of the existence of an ancient cult of fountains. Here, according to Freminville, is a dolmen composed of a horizontal table supported by two stones only, one at each end. All the space beneath this altar is occupied by a long square basin formed of large flat stones, which receives a fountain of water. At Lochrist is another vestige of the Celtic cult of fountains. Beneath the church, and at the foot of the hill upon which it is built, is a sacred fountain, near which is erected an ancient chapel, which with its ivy-covered walls has a most romantic appearance. A Gothic vault protects this fountain. Miraculous virtues are still attributed to its water, and on certain days the country people still come with offerings to draw it (see La Poix de Freminville, *Antiquités de la Bretagne*, i. 101). In the enchanted forest of Brochelande, so famous from its connection with Merlin, was the fountain of Baranton, which was said to possess strange characteristics. Whoever drew water from it, and sprinkled the steps therewith, produced a tremendous storm of thunder and hail, accompanied with thick darkness.

The Christian missionaries could not easily overcome beliefs so planted in the heart of the people, and so strengthened by daily practices. By a wise stroke, whether of policy or instinct, finding themselves unable to eradicate the superstitions which ascribed miraculous power to rocks and woods, streams and fountains, and connected them with the divinities of the old religions, they changed their form and direction by dedicating these objects to the Virgin and to saints, so making the force of the old belief an instrument for its own overthrow.

Fountains were attached to the new religion by the erection of statues of the Virgin or of saints upon the possibly rude structures that collected the water and preserved its purity. There is some uniformity in the architectural characteristics of these structures during the Middle Ages. A very common form in rural districts was that in which the fountain was reached by descending steps (*fontaine grotte*). A large basin received the water, sometimes from a spout, but often from the spring itself. This basin was covered by a sort of porch or vault, with at times moulded arches and sculptured figures and escutcheons. On the bank of the Clain at Poitiers is a fountain of this kind, the Fontaine Joubert, which though restored in 1597 was originally a structure of the 14th century. This kind of fountain is frequently decorated with figures of the Virgin or of saints, or with the family arms of its founder; often, too, the water is the only ornament of the structure, which bears a simple inscription. A large number of these fountains are to be found in Brittany and indeed throughout France, and the great antiquity of some of them is proved by the superstitions regarding them which still exist amongst the peasantry. A form more common in populous districts was that of a large open basin, round, square, polygonal, or lobed in form, with a columnar structure at the centre, from the lower part of which it was arranged that spouts should issue, playing into an open basin, and supplying vessels brought for the purpose in the cleanest and quickest manner. The columns take very various forms, from that of a simple regular geometrical solid, with only grotesque masks at the spouts, to that of an elaborate and ornate Gothic structure, with figures of virgins, saints, and warriors, with mouldings, arches, crockets, and finials. At Provins there is a fountain said to be of the 12th century, which is in form an hexagonal vase with a large column in the centre, the capital of which is pierced by three mouths, which are furnished with heads of bronze projecting far enough to cast the water into the basin. In the public market-place at Brunswick is a fountain of the 15th century, of which the central structure is made of bronze. Many fountains are still existing in France and Germany which, though their actual present structure may date no earlier than the 15th or 16th century, have been found on the place of, and perhaps may almost be considered as restorations of, pre-existing fountains. Except in Italy few fountains are of earlier date than the 14th century. Two of that date are at the abbey of Fontaine Daniel, near Mayenne, and another, of granite, is at Limoges. Some of these Middle Age fountains are simple, open reservoirs inclosed in structures which, however plain, still carry the charm that belongs to the stone-work of those times. There is one of this kind at Cully, Calvados, walled on three sides, and fed from the spring by two circular openings. Its only ornamentation is a small empty niche with mouldings. At Lincoln is a fountain of the time of Henry VIII., in front of the church of St. Mary Wickford. At Durham is one of octangular plan, which bears a statue of Neptune.

The decay of architectural taste in the later centuries is shown by the fountain of Limoges. It is in form a rock representing Mount Parnassus, upon which are carved in relief Apollo, the horse Pegasus, Philosophy, and the Nine Muses. At the top Apollo, in 16th century costume, plays a harp. Rocks, grass, and sheep fill up the scene.

About the earliest drawing of any drinking fountain in England occurs in Moxon's *Tutor to Astronomie and Geography* (1659): it is "surmounted by a diall, which was made by Mr. John Leak, and set upon a composite column at Leadenhall corner, in the majoralty of Sir John Dethick, Knight." The water springs from the top and base of the column, which stands upon a square pedestal and bears four female figures, one at least of which represents the costume of the period. This fountain is referred to and a copy of the engraving given in Chambers's *Book of Days*. The public drinking fountains in towns and villages are now very common and quite secular objects. In the East they are a very important institution. In Cairo alone there are 300. These "sebeels" are not only to be seen in the cities, but are plentiful in the fields and villages, and the great number of them endowed for the gratuitous supply of water to the passengers is referred to by Lane as proving the possession by the Egyptians of a benevolent and charitable character.

Purely ornamental fountains and jets d'eau are found in or near many large cities, royal palaces, and private seats. The Fontana di Trevi, at Rome, is very large and very celebrated, but from an artistic point of view about as bad work as could possibly be conceived. It was erected early in the last century under Pope Clement XII., and has all the characteristics of decadence. La Fontana Paolina and those in the piazza of St. Peter's are perhaps next in celebrity to that of Trevi, and are certainly in better taste. At Paris, the Fontaine des Innocens (the earliest) and those of the Place Royal, of the Champs Élysées, and of the Place de la Concorde are the most noticeable. The fountain of the lions and other fountains in the Alhambra Palace are, with their surroundings, a very magnificent sight. The largest *jets d'eau* are those at Versailles, at the Sydenham Crystal Palace, and at San Ildefonso. With the exception of the last, these are supplied from artificial elevated reservoirs.

For information regarding the geological conditions which cause natural springs and aid in the formation of artificial ones, see ARTESIAN WELLS. (W. HE.)

FOUNTAINS ABBEY. See ABBEY, vol. i. p. 25.

FOUQUÉ, FRIEDRICH HIENRICH KARL, BARON DE LA MOTTE (1777–1843), one of the most industrious and popular of German authors in the early part of this century, was born February 12, 1777, at Brandenburg on the Havel. The family of De la Motte Fouqué was, as the name suggests, of French extraction, but had been driven from France by the revocation of the edict of Nantes; and Fouqué's grandfather, having entered the Prussian army, rose to the rank of general, and became the friend of Frederick the Great. Fouqué's father, at one time an officer of dragoons, lived, at the date of the boy's birth, in retirement at Brandenburg; and his mother, who died in 1788, was a daughter of the Hofmarschall von Schlegell of Dessau. The little Friedrich, godson and namesake of the great king, was brought up in the neighborhood of Potsdam, first at his father's estate Sacro, and afterwards at Lentzke, a property to which they removed when he was nine years old. An only child, he was educated at home by a succession of tutors, one of whom, the author August Hülse, did much to encourage the boy's literary tastes. The somewhat monotonous home life, also, was relieved by holidays spent with relations in a romantic old castle near Halle, and by brilliant visits to Potsdam, whence he came with his little head turned by glimpses of the revered king, by blasts of military music and the tramp of soldiers. When the French Revolution broke out, the young Fouqué eagerly espoused the cause of the royal family. He became discontented with the prospect of studying law at the university of Halle, and in 1794 entered the army as *über-completer Cornet* in the grand-duke of Weimar's cuirassier regiment, then in the field. At the age of nineteen he served in the unfortunate campaign of the Rhine; and for several years afterwards he led a half military half literary life with his regiment, whose headquarters were first at Aschersleben and then at Bückeburg.

Fouqué married very early in life; but the union was an unhappy one and ended in divorce. In 1802, when still only twenty-five, he married his second wife, the widowed Frau von Rochow, better known as Caroline, Baroness de la Motte Fouqué, herself an authoress of some note; and, having obtained his discharge from military service, he retired to his wife's family estate of Nennhausen, near Rathenau, devoting himself to the study of Italian and Spanish, and to bringing out his first work *Dramatische Spiele*, under the feigned name of Pellegrin (1804). The volume was published by the brothers Schlegel, and their names were enough to win popularity for what Fouqué himself afterwards called a "Schülerwerk." It was followed by *Romanzen aus dem Thal Ronceval*, and by two plays, the *Falk* and the *Reh*, which appeared simultaneously. Cheered by praise from the brothers Schlegel, Fouqué set to work with renewed vigor, and in 1806 published a metrical rendering of an old prose romance, the *Historie vom edlen Ritter Galmy, und einer schönen Herzogin von Bretagne.* In the same year appeared the poem *Schiller's Todtenfeier*, the joint work of Bernhardi and Fouqué, who still wrote under the name of Pellegrin; and in 1808 he published *Alwin*, a romance in 2 vols. This won for him many literary admirers, perhaps the chief of whom was Jean Paul Friedrich Richter. *Sigurd der Schlangentödter* (published 1808) was founded on the story of the Nibelungenlied, and formed the first of a collection which appeared in 1818 under the title *Heldenspiele. Sigurd* was the first work published in Fouqué's own name. In 1811 appeared a play, *Eginhard und Emma*, two volumes entitled *Vaterländische Schauspiele*, and the chivalric romance *Der Zauberring.* Conjointly with Frau von Helvig of Heidelberg he issued a *Taschenbuch der Sagen und Legenden* (1812–13), and with his friend Wilhelm Neumann began a periodical called *Die Musen* (1812–14). Another collection of plays, *Schauspiele für Preussen*, was published in 1813, and in 1814 *Corona*, a poem, and *Der Todesbund*, a romance, forming the first of a series in six separate volumes entitled *Kleine Romane* (1814–19). In the same year (1814) he published a series in four parts entitled the *Jahreszeiten*, the spring number of which contained his romance *Undine*, the summer number *Die beiden Hauptleute*, the autumn number *Aslauga's Ritter* and *Algin und Jucunda*, and the winter number *Sintram und seine Gefährten. Die Fahrten Thiodolfs des Isländers*, another story of chivalry, appeared in 1814, and was considered by Fouqué himself to be one of his most successful works. In 1816 he translated a tragedy, *Numancia*, from the Spanish of Cervantes, and published also *Der Sängers Liebe, Karl's des Grossen Geburt und Jugendsjahre*, and a tragedy called the *Pilgerfahrt.* Meanwhile in February, 1813, he had rejoined the army as lieutenant of cavalry, and twice narrowly escaped with his life at the battle of Lützen. After the battle, while he was carrying an important dispatch over country at night, his horse stumbled into deep water; and this misadventure resulted in an illness which disabled him for further service. He received an honorable discharge, was presented with the decoration of the "Johanniterorden," and promoted to the rank of major of cavalry. The invalided soldier now returned to his wife and daughter at Nennhausen, and again took up his pen. His wife died in 1831; and, having removed to Halle, he married there for the third time. He delivered lectures in Halle on the history of poetry and other forms of literature, and had gone to Berlin with the purpose of lecturing there also, when he died suddenly, January 23, 1843, aged 66.

The following is a list of his publications from 1817 downwards:—*Die Wunderbaren Fahrten des Grafen Alethes von Lindenstein* (1817); *Altsächsische Bildersaal* (1818–20); *Der Mord Augusts von Kotzebue: Freundesruf an Deutschlands Jugend* (1819); *Bertrand du Guesclin* (1821); *Hieronymus von Stauf* (1821); *Der Verfolgte, Wilde Liebe*, and *Ritter Elidone* (1822); *Refugié, oder Heimath und Fremde: ein Roman aus der neuen Zeit* (1824); *Lebensbeschreibungen des Konigl. Preuss. Generals der Infanterie, H. A. Baron de la Motte Fouqué* (1824); a collection of his poems in 5 vols., containing most of his lyrics and dramas (1816–27); *Geschichte der Jungfrau von Orleans* (1826); *Der Sängerkrieg auf der Wartburg* (1828); *General v. Rüchel, eine militärische Biographie* (1828); *Fata Morgana* (1830); *Erzählungen u. Novellen* (1833); *Die Weltreiche* (1835–40); *Büchlein von der Liebeslehre* (1837); *Der Pappenheimer Cuirassier* (1842); *Lebensgeschichte des Baron Friedrich de la Motte Fouqué, aufgezeichnet durch ihn selbst* (1840); *Goethe und Einer seiner Bewunderer* (1840); *Ausgewählte Werke des Baron Fr. de la Motte Fouqué, Ausgabe letzter Hand* (1841). A posthumous romance, entitled *Abfall und Busse, oder die Seelenspiegel,—ein Roman aus der Grenzscheide das 18 und 19 Jahrh.*, was published in 1844; also a collection entitled *Geistliche Gedichte* (1858), and *Christlicher Liederschatz* (1862).

Fouqué's popularity was great; but he had the misfortune to outlive it. A disciple of the brothers Schlegel and the Romance School in Germany, he became one of its most illustrious representatives. There was a time when Fouqué's volumes were in every German household, and people waited eagerly at the libraries for his newest work. But he lived to see the change in literary taste which shelved the romance school, and with it almost all his own writings. The greater part of these are being now quickly forgotten. Those which have survived, and will survive, the variations of popular taste, are his romances—the *Zauberring* and the contents of the *Jahreszeiten*, especially the exquisite *Undine*, which has always been considered his masterpiece. Fouqué's was not an intellect of the very highest order, neither was he a man of intense feelings; and those who expect to find in his works deep thinking or highly-wrought passion will be disappointed. Should they, however, desire the graceful, the romantic, the exquisite, it is there in abundance. They will find a beauty and simplicity of style unsurpassed in the German language; plots, light and airy, laid in scenes of opal hue. For Fouqué aimed at ethereal beauty, delighted in word-painting, and flitted continually between the glories of a crimson Spanish sunset and the cold steel-blue of a north German nightfall. There is in his works plenty of sweet pathos, of a kind which may wet the eye but never wrings the heart; there is also a truly German love of the weird and supernatural; but their especial characteristic is their pure, chivalric tone:—"An ideal of Christian knighthood," says the translator of *Wilhelm Meister*, in his *German Romance*, "whencesoever borrowed or derived, has all along, with more or less distinctness, hovered round his fancy." It is in allusion to this same characteristic that Jean Paul Richter, Fouqué's illustrious critic in the *Heildelberger Jahrbücher*, has christened him "Der Tapfere," or "The Valiant."

Of Fouqué's works, the *Undine*, the *Zauberring*, *Aslauga's Ritter*, and *Sintram* have been translated into English. The translation of *Aslauga's Ritter* is in Carlyle's *German Romance*. (F. M.)

FOUQUET, Nicolas (1615–1680), viscount of Melun and of Vaux, marquis of Belle-Isle, superintendent of finance under Louis XIV., was born at Paris in 1615. Destined to official life, he was carefully educated; and so evident was his superior ability that he was appointed master of requests at the age of twenty. He was only thirty-five when he obtained the important post of *procureur-général* to the parliament of Paris (1650). During the civil war Fouquet devoted himself to the interests of the queen-mother, Anne of Austria, and enjoyed in return her protection and patronage. At her instance he was called in 1652 to the office of superintendent of finance. The finances were then in a state of the utmost disorder, from the long wars and the shameless greed of courtiers and officials; and it is stated that Fouquet for a time provided the means of meeting the expenses of the state out of his own fortune or by loans obtained on his own credit. He had long been in the confidence of the first minister, Cardinal Mazarin, and was his zealous instrument. But soon after the marriage of Louis XIV. a quarrel broke out between them, and thenceforth each was bent on injuring the other. The increasing deficit in the treasury alarmed the king; inquiries were addressed to Colbert, who was secretly ambitious of succeeding Fouquet as minister of finance, and he consequently made the worst of the case against Fouquet. The extravagant expenditure and personal display of the superintendent served to intensify the ill-will of the king. Fouquet had bought the port of Belle-Isle, and strengthened its fortifications, with a view to taking refuge there in case of disgrace. He had spent enormous sums in building a palace on his estate of Vaux, which in its extent, magnificence, and splendor of decoration, was almost a forecast of Versailles. He had cherished the hope of succeeding Mazarin as first minister, and had even made advances to Mademoiselle de la Vallière. In August, 1661, he entertained the king at his palace of Vaux, giving him a fête unrivalled for magnificence, at which *Les Fâcheux* of Molière was for the first time produced. But the king could not be appeased. By crafty devices Fouquet had been induced to sell his office of *procureur-général*, thus losing the protection of its privileges, and he had paid the price of it into the treasury. The king, however, was only prevented from arresting him at the fête by the pleading of the queen mother. He dissembled for a short time, and the arrest was made about three weeks later at Nantes. Fouquet, after several removals from prison to prison, was sent to the Bastille. His trial extended over several years, and excited the deepest interest. In 1664 he was condemned and sentenced to perpetual exile and confiscation of his property. The sentence, however, was commuted into one of imprisonment for life in the fortress of Pignerol. He bore his fate with manly fortitude, and composed in prison several devotional works. He died at Pignerol March 23, 1680. The report of his trial was published in Holland, in 15 vols., in 1665–1667, in spite of the remonstrances which Colbert addressed to the states-general. A second edition, under the title of *Œuvres de M. Fouquet*, appeared in 1696.

FOUQUIER-TINVILLE, Antoine Quentin (1747–1795), was born at Hérouel, a village in the department of the Aisne. Originally a *procureur* (attorney) attached to the châtelet jurisdiction at Paris, he is said to have been driven by his debts to accept a humble employment under the lieutenant-général de police. When the Revolution broke out he was, as the friend of Danton and Robespierre, appointed public prosecutor to the revolutionary tribunal of Paris, and discharged this office with the most unimpassioned rigor from the 10th of March, 1793, to the 28th of July, 1794. He dealt as pitilessly with his friends as with his enemies, if only they were charged by the committee of public safety. He sent to the guillotine his protector Danton, just as he had sent Vergniaud and the Girondists. He was not an eloquent speaker, but maintained his accusations with an obstinacy so cold, convincing, and pressing that he never failed to obtain from the judges the sentence of capital punishment, which he always claimed. Although it seems that he had been somewhat unscrupulous in the earlier part of his career, he was, during the period of his bloody mission, inaccessible to bribery; and, having accepted it as his business to provide the guillotine with a constant supply of victims, he might well boast of faithfulness in its discharge. And this he actually did in the pamphlet that he published in his own defence, when he had been imprisoned by order of the convention (August 1, 1794), on the motion of Fréron, whose hands had been as deeply imbrued in blood as those of Fouquier. But the men then in power wielded the terrors of the law in a spirit of revenge that made them as unsparing as Robespierre and his companions had been. After a trial which lasted forty-one days, Fouquier-Tinville was in his turn sent to the scaffold, on the 8th of May, 1795.

See *Mémoire pour A. Q. Fouquier, ex-accusateur public près le tribunal révolutionnaire établi à Paris, et rendu volontairement à la Conciergerie le jour du décret qui ordonne son arrestation*, Paris, 1794, 4to; A. J. T. Bonnemain, *Les Chemises rouges, ou mémoires pour servir à l'histoire du règne des anarchistes*, Paris, 1799, 2 vols. 8vo; Ch. Berriat-Saint-Prix, *La Justice révolutionnaire à Paris, Bordeaux, Brest, Lyons, Nantes, etc.*, Paris, 1861, 18mo; E. Campardon, *Histoire du Tribunal révolutionnaire de Paris*, Paris, 1861, 2 vols. 18mo (the 2d edition, Paris, 1866, 2 vols. 8vo, has a slightly altered title, *Tribunal révolutionnaire de Paris*); Mortimer-Ternaux, *Histoire de la Terreur d'après les documents authentiques et des pièces inédites*, Paris, 1861, etc., 8 vols. 8vo.

FOURCHAMBAULT, a town of France in the department of Nièvre, on the right bank of the Loire, with a station on the railway about 5 miles S.E. of Nevers. It owes its importance to its extensive iron-works, which were established in 1821 by MM. Boignes, and give employment to from 2000 to 5000 workmen. Among the more remarkable *chefs d'œuvre* which have been produced at Fourchambault are the metal portions of the Pont du Carrousel, some of the bronzes of the Colonne du Juillet, the framework of the cathedral at Chartres, and the vast spans of the bridge over the Dordogne at Cubzac. The population of the town in 1871 was 5835, and of the commune 6054.

FOURCROY, Antoine François, Comte de (1755–1809), a celebrated chemist, son of an apothecary in the household of the duke of Orleans, was born at Paris, June 15, 1755. Some of his ancestors had been distinguished at the bar, but the branch of the family to which he belonged had become greatly reduced in circumstances. At the age of fourteen Fourcroy left the college at Harcourt, where he had profited but little by the instruction of a harsh teacher. Deterred by the ill-success of a friend from going upon the stage, he for two years maintained himself as a copyist and writing-master; he then, in consequence of unjust treatment there received, left the office of his employer. At this juncture, Vicq d'Azyr, who having boarded at his home had become acquainted with the young man's talents, encouraged him to enter upon a medical career. We accordingly now behold Fourcroy a poor and hard-working student of medicine, his lodging a garret, in the middle only of which was it possible to stand upright, and his near neighbor a water-carrier, to whose family of twelve he acted as physician, receiving for his services a good supply of water. To support himself he gave lessons to other students, and made translations for a bookseller, who 30 years later, when Fourcroy had become director-general of public instruction, conscientiously offered to make up for the meagreness of his former remuneration. In 1777, under the auspices of the Société Royale de Médecine, appeared Fourcroy's first publication, *Essai sur les Maladies des Artisans*, the translation of a Latin work by Ramazzini, with notes and additions. At length Fourcroy, who was recognized as the most successful alumnus of the Parisian medical school, became an applicant for a gratuitous degree and license, provision for the granting of which to the best deserving poor student had been made by the bequest of a Dr. Diest. It so happened that the faculty of physic at Paris entertained feelings of the most jealous enmity against the newly-founded Société Royale de Médecine, of which Vicq d'Azyr was perpetual secretary, and to humiliate him, and in him the whole society, it rejected his protégé Fourcroy. Upon this the society itself subscribed the fees requisite for a diploma (£250), which was obtained by Fourcroy in 1780; but as the degree of "docteur regent" was unanimously refused, it was impossible for him to procure any professorship under the faculty. However, in 1784 his reputation as a chemist gained for him, although Berthollet was his fellow candidate, the lectureship of chemistry at the college of the Jardin du Roi, which had become vacant by the death of Macquer, one of the last of the phlogistic school. This post he continued to hold for the next 25 years; and so great were the crowds which his eloquence attracted that it was twice necessary to enlarge his lecture-theatre. Fourcroy was one of the first converts to the theories of Lavoisier, which he designated "La Chimie Française," a name which, as Thomson remarks (*History of Chemistry*, ii. p. 130), "certainly contributed more than anything else to give the new notions currency, at least in France." Together with Berthollet, Fourcroy was associated with Lavoisier and Guyton de Morveau in 1786 and 1787 in the preparation of a work entitled *Méthode de Nomenclature Chimique*, published in the latter year. In 1785 a memoir on the tendons, subsequently completed in six parts, gained for him admission into the French Academy of Sciences. He became in 1792 one of the deputies of the National Convention, and in 1793 a member of the Assembly, and soon proved himself one of the most active of the committee for the public instruction. To him was due the enlargement of the Jardin des Plantes, and the formation of a commission for the preservation of works of art. He further was the means of releasing from imprisonment Desault, surgeon of the Hôtel-Dieu, and of preventing the execution of Darcet, though, unfortunately for science, he found no opportunity of rescuing Lavoisier. On the 9th of Thermidor he was appointed a member of the committee for the public safety, and in this capacity he instituted three schools of medicine, assisted in the organization of the École Polytechnique (at that time the École des Travaux Publiques), and was concerned also in the establishment of the École Normale, the Institut, and the Musée d'Histoire Naturelle. After the revolution of the 9th November, 1799, he was made a councillor of state; and, being appointed director-general of instruction, he in the course of 5 years superintended the formation of 12 schools of law, over 30 lyceums, afterwards called royal colleges, and 300 elementary schools. His incessant labors at length told on his health, and he suffered greatly from palpitation of the heart. On the 16th December, 1809, the very day on which by letters patent he had been created a count of the French empire, with a yearly pension of 20,000 francs, he was signing some despatches when he suddenly exclaimed "Je suis mort," and with those words expired.

Among the separate publications of Fourcroy are *Leçons élémentaires d'Histoire naturelle, et de Chimie*, 2 vols. 8vo, 1782, enlarged, after several editions, to 10 vols. 8vo, with the title *Système des Connaissances chimiques*, 6 vols. 4to, 1801–2; *Mémoires et Observations de Chimie*, 8vo, 1784; *L'Art de connaître et d'employer les Médicamens dans les Maladies*, 2 vols. 8vo, 1785; *Essai sur le Phlogistique et les Acides*, 8vo, 1788, from the English of Kirwan, with notes by De Morveau and De Fourcroy; *Philosophie Chimique, ou Vérités fondamentales de la Chimie moderne*, 8vo, 1795, perhaps his best work, of which several editions and translations appeared; *Notice sur la Vie et* *les Travaux de Lavoisier*, 8vo, 1796; *Tableaux synoptiques de Chimie*, 4to, 1800; *Discours sur l'Instruction publique*, 8vo, 1802. He was the author of more than 160 papers on chemical subjects, contributed to the *Mémoires* of the Academy and the Institute, the *Annales de Chimie*, and the *Annales de Musée d'Histoire Naturelle*, and was editor of *Le Médecin Éclairé*. The more important of his later researches were published jointly in his own name and that of Vanquelin, whom he befriended, and was the means of first bringing into notice.

See Palissot de Beauvois, *Éloge Historique*, 1810; G. Cuvier, "Éloge Historique," *Mém. de l'Inst.*, 1810, pp. xcvi.–cxxviii., and *Ann. Mus. Hist. Nat.*, xvii. 1811, pp. 99–132; Thomson, *Annals*, i. 1818.

FOURIER, FRANÇOIS CHARLES MARIE (1772–1837), one of the most celebrated socialist writers, was born at Besançon in Franche-Comté, on the 7th April, 1772. His father was a draper in good circumstances, and Fourier received an excellent education at the college in his native town. After completing his studies there he travelled for some time in France, Germany, and Holland. On the death of his father he inherited a considerable amount of property, which, however, was lost when Lyons was besieged by the troops of the Convention. Being thus deprived of his means of livelihood, Fourier entered the army, but after two years' service as a chasseur was discharged on account of ill-health. In 1803 he published a remarkable article on European politics which attracted the notice of Napoleon, some of whose ideas were foreshadowed in it. Inquiries were made after the author, but nothing seems to have come of them. After leaving the army Fourier entered a merchant's office in Lyons, and some years later undertook on his own account a small business as broker. He obtained in this way just sufficient to supply his wants, and devoted all his leisure time to the elaboration of his first work on the organization of society.

During the early part of his life, and while engaged in commerce, he had become deeply impressed with the conviction that social arrangements resulting from the principles of individualism and competition were essentially imperfect and immoral. He proposed to substitute for these principles co-operation or united effort, by means of which full and harmonious development might be given to human nature. The scheme, worked out in detail in his first work, *Théorie des Quatre Mouvements* (2 vols., Lyons, 1808, published anonymously), has for foundation a particular psychological proposition and a special economical doctrine. Psychologically Fourier held what may with some laxity of language be called natural optimism,—the view that the full, free development of human nature or the unrestrained indulgence of human passion is the only possible way to happiness and virtue, and that misery and vice spring from the unnatural restraints imposed by society on the gratification of desire. This principle of harmony among the passions he regarded as his grandest discovery—a discovery which did more than set him on a level with Newton, the discoverer of the principle of attraction or harmony among material bodies. Throughout his works, in uncouth, obscure, and often unintelligible language, he endeavors to show that the same fundamental fact of harmony is to be found in the four great departments,—society, animal life, organic life, and the material universe. In order to give effect to this principle and obtain the resulting social harmony, it was needful that society should be reconstructed; for, as the social organism is at present constituted, innumerable restrictions are imposed upon the free development of human desire. As practical principle for such a reconstruction Fourier advocated co-operative or united industry. In many respects what he says of co-operation, in particular as to the enormous waste of economic force which the actual arrangements of society entail, still deserves attention, and some of the most recent efforts towards extension of the co-operative method, *e.g.*, to house-keeping, were in essentials anticipated by him. But the full realization of his scheme demanded much more than the mere admission that co-operation is economically more efficacious than individualism. Society as a whole must be organized on the lines requisite to give full scope to co-operation and to the harmonious evolution of human nature. The details of this reorganization of the social structure cannot be given briefly, but the broad outlines may be thus sketched. Society, on his scheme, is to be divided into departments or *phalanges*, each *phalange* numbering about 1600 persons. Each *phalange* inhabits a *phalanstère* or common building, and has a certain portion of soil allotted to it for cultivation. The *phalanstères* are built after a uniform plan, and the domestic arrangements are laid down very elaborately. The staple industry of the *phalanges* is, of course, agriculture, but the various *series* and *groupes* into which the members are divided may devote themselves to such occupations as are most to their taste; nor need any occupation become irksome from constant devotion to it. Any member of a group may vary his employment at pleasure, may pass from one task to another. The tasks regarded as menial or degrading in ordinary society can be rendered attractive if advantage is taken of the proper principles of human nature: thus children, who have a natural affinity for dirt, and a fondness for "cleaning up," may easily be induced to accept with eagerness the functions of public scavengers. It is not, on Fourier's scheme, necessary that private property should be abolished, nor is the privacy of family life impossible within the phalanstère. Each family may have separate apartments, and there may be richer and poorer members. But the rich and poor are to be locally intermingled in order that the broad distinction between them, which is so painful a feature in actual society, may become almost imperceptible. Out of the common gain of the phalange a certain portion is deducted to furnish to each member the minimum of subsistence; the remainder is distributed in shares to labor, capital, and talent,—five-twelfths going to the first, four-twelfths to the second, and three-twelfths to the third. Upon the changes requisite in the private life of the members Fourier was in his first work more explicit than in his later writings. The institution of marriage, which imposes unnatural bonds on human passion, is of necessity abolished; a new and ingeniously constructed system of license is substituted for it. Considerable offence seems to have been given by Fourier's utterances with regard to marriage, and generally the later advocates of his views are content to pass the matter over in silence, or to veil their teaching under obscure and metaphorical language.

The scheme thus sketched attracted no attention when the *Théorie* first appeared, and for some years Fourier remained in his obscure position at Lyons. In 1812 the death of his mother put him in possession of a small sum of money, with which he retired to Bellay in order to perfect his second work. The *Traité de l'Association Agricole Domestique* was published in 2 vols. at Paris in 1822, and a summary appeared in the following year. After its publication the author proceeded to Paris in the hope that some wealthy capitalist might be induced to attempt the realization of the projected scheme. Disappointed in this expectation, he returned to Lyons. In 1826 he again visited Paris, and as a considerable portion of his means had been expended in the publication of his book, he accepted a clerkship in an American firm. In 1829 and 1830 appeared what is probably the most finished exposition of his views, *Le Nouveau Monde Industriel*. In 1831 he attacked the rival socialist doctrines of St. Simon and Owen in the small work *Piéges et Charlatanisme de deux Sectes, St. Simon et Owen*. His writings now began to attract some attention. A small body of adherents gathered around him, and the most ardent of them, Victor Considérant, published in 1834 his *Destinée Sociale*, undoubtedly the most able and most important work of the Fourierist school. In 1832 a newspaper, *Le Phalanstère ou la Réforme Industrielle*, was started to propagate the views of the school, but its success was not great. In 1833 it declined from a weekly to a monthly, and in 1834 it died of inanition. It was revived in 1836 as *Le Phalange*, and in 1843 became a daily paper, *La Democratie Pacifique*. In 1850 it was suppressed.

Fourier did not live to see the success of his newspaper, and the only practical attempt during his lifetime to establish a phalanstère was a complete failure. In 1832 M. Baudet Dulary, deputy for Seine-et-Oise, who had become a convert, purchased an estate at Condé sur Vesgre, near the forest of Rambouillet, and proceeded to establish a socialist community. The capital supplied was, however, inadequate, and the community broke up in disgust. Fourier was in no way discouraged by this failure, and till his death, in October, 1837, lived in daily expectation that wealthy capitalists would see the merits of his scheme, and be induced to devote their fortunes to its realization. It may be added that subsequent attempts to establish the phalanstère have been uniformly unsuccessful.

For an examination of the principles on which Fourier's socialist scheme is based, reference must be made to the general articles COMMUNISM and SOCIALISM, but a word must be added as to the character of the man and his works. Fourier seems to have been of extremely retiring and sensitive disposition. He mixed little in society, and appeared, indeed, as if he were the denizen of some other planet. Of the true nature of social arrangements, and of the manner in which they naturally grow and become organized, he must be pronounced extremely ignorant. The faults of existing institutions presented themselves to him in an altogether distorted manner, and he never appears to have recognized that the evils of actual society are immeasurably less serious than the consequences of his arbitrary scheme. Out of the chaos of human passion he supposed harmony was to be evolved by the adoption of a few theoretically disputable principles, which themselves impose restraints even more irksome than those due to actual social facts. With regard to the economic aspects of his proposed new method, it is of course to be granted that co-operation is more effective than individual effort, but he has nowhere faced the question as to the probable consequences of organizing society on the abolition of those great institutions which have grown with its growth. His temperament was too ardent, his imagination too strong, and his acquaintance with the realities of life too slight to enable him justly to estimate the merits of his fantastic views. That this description of him is not expressed in over-strong language must be clear to any one who not only considers what is true in his works—and the portion of truth is by no means a peculiar discovery of Fourier's,—but who takes into account the whole body of his speculations, the cosmological and historical as well as the economical and social. No words can adequately describe the fantastic nonsense which he pours forth, partly in the form of general speculation on the universe, partly in the form of prophetic utterances with regard to the future changes in humanity and its material environment. From these extraordinary writings it is no extreme conclusion that there was much of insanity in Fourier's mental constitution.

Ch. Pellarin, *Fourier, sa Vie et sa Théorie*, 5th ed., 1872; Sargant, *Social Innovators*, 1859; Reybaud, *Réformateurs Modernes*, 7th ed, 1864; Stein, *Socialismus und Communismus des heutigen Frankreichs*, 2d ed., 1848; Booth, *Fortnightly Review*, N. S., vol. xii. (R. AD.)

FOURIER, JEAN BAPTISTE JOSEPH (1768–1830), French mathematician, was born at Auxerre, March 21, 1768. He was the son of a tailor, and was left an orphan in his eighth year; but through the kindness of a friend, who observed in him the promise of superior abilities, admission was gained for him into the military school of his native town, which was then under the direction of the Benedictines of Saint-Maur. He soon distinguished himself as a student, and made rapid progress, delighting most of all, but not exclusively, in mathematics. It was his wish to enter the artillery or engineer corps, but failing in this, he was appointed professor of mathematics in the school in which he had been a pupil. This post he held for about four years (1789–1794), and during this time he was frequently called to lecture on other subjects, rhetoric, philosophy, and history. On the institution of the normal school at Paris he was sent to teach in it, and was afterwards attached to the polytechnic school. Fourier was one of the savants who accompanied Bonaparte to Egypt in 1798; and during this expedition he was called to discharge important political duties in addition to his scientific ones. He was for a time virtually governor of half Egypt, was for three years secretary of the institute of Cairo, and undertook to deliver the funeral orations for Kléber and Desaix. On his return to France he was nominated prefect of Grenoble, and was created baron and chevalier of the Legion of Honor. He took an important part in the preparation of the famous *Description de l'Egypte*, and wrote the historical introduction. He held his prefecture for 14 years; and it was during this period that he carried on his elaborate and fruitful investigations on the propagation of heat in solid bodies. His first memoir on the mathematical theory of heat was crowned by the Academy. On the return of Napoleon I. from Elba in 1815, Fourier published a royalist proclamation, and left Grenoble as Napoleon entered it. He was then deprived of his prefecture, and, although immediately named prefect of the Rhône, was soon after again deprived. He now settled at Paris, was elected to the Academy of Sciences in 1816, but in consequence of the opposition of Louis XVIII. was not admitted till the following year, and was afterwards made perpetual secretary in conjunction with Cuvier. In 1822 he published his most celebrated work, entitled, *La Théorie Analytique de la Chaleur*, which by its new methods and great results made an epoch in the history of mathematical and physical science. Of this work M. Cousin said that the grandeur of its results was no more to be questioned than their certainty, and that in the opinion of scientific Europe the novelty of the analysis on which they rest is as evident as its completeness. In 1827 Fourier was received at the French Academy, and the same year succeeded Laplace as president of the council of the polytechnic school. In 1828 he became a member of the Government commission established for the encouragement of literature. He died at Paris, May 16, 1830. After his death appeared his remarkable work entitled *Analyse des équations determinées*, which was written in his youth and left unfinished. It was completed and edited by M. Navier in 1831. In addition to the works above mentioned, Fourier wrote many memoirs on scientific subjects, and *éloges* of distinguished men of science.

FOURMONT, ÉTIENNE (1683–1745), a French Orientalist, was born at Habelai, near St. Denis, in 1683. He studied in Mazarin College, and afterwards in the seminary of Trente-trois. Here his attention was attracted to Oriental languages, and shortly after leaving the seminary he published a *Traduction du Commentaire du Rabbin Abraham Aben Esra sur l'Ecclésiaste*. He subsequently studied at Navarre, and in 1705 brought out *Nouvelle Critique Sacrée*, which gained him the notice of the professors of the Sorbonne. In 1711 Louis XIV. appointed Fourmont to assist a young Chinese, Hoan-ji, in compiling a Chinese grammar, and notwithstanding that Hoan-ji died in 1716, Fourmont persevered alone at the task assigned him, and published in 1737 *Meditationes Sinicæ*, and in 1742 *Grammatica Sinica*. Besides numerous other works connected with Oriental literature, he is the author of *Réflexions Critiques sur les Histoires des Anciens Peuples*, Paris, 1735, and several dissertations printed in the *Mémoires* of the Academy of Inscriptions. He became professor of Arabic in the Royal College in 1715. In 1713 he was elected a member of the Academy of Inscriptions, in 1738 a member of the Royal Society of London, and in 1741 a member of that of Berlin. He died at Paris in December, 1745. He must not be confounded with Michel Fourmont (1690-1746), his youngest brother, who also was a member of the Academy of Inscriptions, was professor of the Syriac language in the Royal College, and was sent by the Government to copy inscriptions in Greece.

FOURNIER, PIERRE SIMON (1712–1768), French engraver and type-founder, was born at Paris, September 15, 1712. He was the son of a printer, and was brought up to his father's business. After studying drawing under the painter Colson, he practised for some time the art of wood-engraving, and ultimately turned his attention to the engraving and casting of types. He designed many new characters, and his foundry became celebrated not only in France but in foreign countries. Not content with his practical achievements, he sought to stimulate public interest in his art by the production of various works on the subject. In 1737 he published his *Table des Proportions qu'il faut observer entre les Caractères*, which was followed by several other technical treatises. In 1758 he assailed the title of Guttenberg to the honor awarded him as inventor of printing, claiming it for Schöffer, in his *Dissertation sur l'Origine et les Progrès de l'Art de graver en Bois*. This gave rise to a controversy in which Schöpflin and Baer were his opponents. Fournier's contributions to this debate were collected and reprinted under the title of *Traités historiques et critiques sur l'Origine de l'Imprimerie*. His principal work, however, was the *Manuel Typographique*, which appeared in 2 vols. 8vo in 1764, the first volume treating of engraving and type-founding, the second of printing, with examples of different alphabets. It was the author's design to complete the work in four volumes, but he did not live to execute it. He died at Paris, October 8, 1768.

FOWL (Danish *Fugl*, German *Vogel*), originally used in the sense that Bird[1] now is, but, except in composition,—as Sea-Fowl, Wild-Fowl, and the like,—practically almost confined[1] at present to designate the otherwise nameless species which struts on our dunghills, gathers round our barn-doors, or stocks our poultry yards—the type of the genus *Gallus* of ornithologists, of which four well-marked species are known. The *first* of these is the Red Jungle-Fowl of the greater part of India, *G. ferrugineus*,—called by many writers *G. bankiva*,—which is undoubtedly the parent stock of all the domestic races (*cf.* Darwin, *Animals and Plants under Domestication*, i. pp. 233-246). It inhabits Northern India from Sindh to Burmah and Cochin China, as well as the Malay Peninsula and many of the islands as far as Timor, besides the Philippines. It occurs on the Himalayas up to the height of 4000 feet, and its southern limits in the west of India proper are, according to Jerdon, found on the Raj-peepla hills to the south of the Nerbudda, and in the east near the left bank of the Godavery, or perhaps even further, as he had heard of its being killed at Cummum. This species greatly resembles in plumage what is commonly known among poultry-fanciers as the "Black-breasted Game" breed, and this is said to be especially the case with examples from the Malay countries, between which and examples from India some differences are observable—the latter having the plumage less red, the ear-lappets almost invariably white, and slate-colored legs, while in the former the ear-lappets are crimson, like the comb and wattles, and the legs yellowish. If the Malayan birds be considered distinct, it is to them that the name *G. bankiva* properly applies. This species is said to be found in lofty forests and in dense thickets, as well as in ordinary bamboo-jungles, and when cultivated land is near its haunts, it may be seen in the fields after the crops are cut in straggling parties of from 10 to 20. The crow to which the cock gives utterance morning and evening is described as being just like that of a Bantam, but never prolonged as in some domestic birds. The hen breeds from January to July, according to the locality; and lays from 8 to 12 creamy-white eggs, occasionally scraping together a few leaves or a little dry grass by way of a nest. The so-called *G. giganteus*, formerly taken by some ornithologists for a distinct species, is now regarded as a tame breed of *G. ferrugineus* or *bankiva*. The *second* good species is the Gray Jungle-Fowl, *G. sonnerati*, whose range begins a little to the northward of the limits of the preceding, and it occupies the southern part of the Indian peninsula, without being found elsewhere. The cock has the shaft of the neck-hackles dilated, forming a horny plate, the terminal portion of which is like a drop of yellow sealing-wax. His call is said to be very peculiar, being a broken and imperfect kind of crow, quite unlike that of *G. ferrugineus*, and impossible, says Jerdon, to describe. The two species, where their respective ranges overlap, occasionally interbreed in a wild state, and the present readily crosses in confinement with domestic poultry, but the hybrids are nearly always sterile. The *third* species is the Cingalese Jungle-Fowl, *G. stanleyi* (the *G. lafayettii* of some authors), peculiar to Ceylon. This also greatly resembles in plumage some domestic birds, but the cock is red beneath, and has a yellow comb with a red edge, and purplish-red cheeks and wattles. He has also a singularly different voice, his crow being dissyllabic. This bird crosses readily with tame hens, but the hybrids are believed to be infertile. The *fourth* species, *G. varius* (the *G. furcatus* of some authors), inhabits Java and the islands eastward as far as Flores. This differs remarkably from the others in not possessing hackles, and in having a large unserrated comb of red and blue, and only a single chin wattle. The predominance of green in its plumage is another easy mark of distinction. Hybrids between this species and domestic birds are often produced, but they are most commonly sterile. Some of them have been mistaken for distinct species, as those which have received the names of *G. æneus* and *G. temmincki*.

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[1] *Bird* (cognate with *breed* and *brood*) was originally the young of any animal, and an early Act of the Scottish parliament speaks of "Wolf-birdis," *i.e.*, Wolf-cubs.

Several circumstances seem to render it likely that Fowls were first domesticated in Burmah or the countries adjacent thereto, and it is the tradition of the Chinese that they received their poultry from the West about the year 1400 B.C. By the Institutes of Manu, the date of which is variously assigned from 1200 to 800 B.C., the tame Fowl is forbidden, though the wild is allowed to be eaten—showing that its domestication was accomplished when they were written. The bird is not mentioned in the Old Testament nor by Homer, though he has Ἀλέκτωρ (Cock) as the name of a man, nor is it figured on ancient Egyptian monuments. Pindar mentions it, and Aristophanes calls it the Persian bird, thus indicating it to have been introduced to Greece through Persia, and it is figured on Babylonian cylinders between the 6th and 7th centuries B.C. It is sculptured on the Lycian marbles in the British Museum (*circa* 600 B.C.), and Blyth remarks (*Ibis*, 1867, p. 157) that it is there represented with the appearance of a true Jungle-Fowl, for none of the wild *Galli* have the upright bearing of the tame breed, but carry their tail in a drooping position. For further particulars of these breeds see POULTRY. (A. N.)

FOWLER, CHARLES (1792–1867), architect, was born at Collumpton, Devon, May 17, 1792. After serving an apprenticeship of five years at Exeter, he went to London in 1814, and entered the office of David Laing, where he remained till he commenced practice for himself. His first work of importance was the Court of Bankruptcy in Basinghall Street, finished in 1821. Although he gained in the following year the first premium for a design for the new London bridge, a design by another architect was ultimately agreed upon and carried out. Among Fowler's other designs for bridges is that for the one constructed across the Dart at Totness. He was also the architect for the markets of Covent Garden and Hungerford, the new market at Gravesend, and Exeter lower market; and besides several churches he designed Devon lunatic asylum (1845), the London fever hospital (1849), and the hall of the Wax Chandlers' Company, Gresham Street (1853). For some years he was honorary secretary of the institute of British architects, and he was afterwards created vice-president. He retired from his profession in 1853, and died at Great Marlow, Bucks, September 26, 1867.

FOWLER, JOHN (1826–1864), inventor of the steam plough, was born at Melksham, Wilts, July 11, 1826. He learned practical engineering at Middlesborough-on-Tees, and in 1849 invented a machine for laying drain tiles, which was at first worked by horses, but afterwards by steam. In 1852 he began experiments in steam cultivation, and at the Chester meeting in 1858 he received for his steam plough the Royal Agricultural Society's prize of £500. In conjunction with two partners he established in 1861, at Leeds, the well known firm of Fowler & Co. He died 4th December, 1864. See AGRICULTURE.

FOWLER, WILLIAM (*c.* 1560–1614), one of the poets who frequented the court of James VI. before his accession to the throne of England, was born about the year 1560. After attending St. Leonard's College, St. Andrews, between 1573–74 and 1578, he seems to have selected the legal profession, and in 1580, when about twenty years of age, he was at Paris studying the civil law. He subsequently became private secretary and master of requests to Anne of Denmark, wife of James VI. On the occasion of the baptism of Prince Henry on 30th August, 1594, the preparation of the pageants exhibited "was by the king's majesty committed to the lord of Lindores and Mr. William Fowler;" and the description of these "rareshows and singular inventions" was published at the time. The sister of Fowler, Susannah, was married to Sir John Drummond, Knight, and gentleman usher of the black rod, and was mother of the celebrated poet Drummond of Hawthornden. On the title of some of his works Fowler styles himself P. of Hawick, thus indicating that he was parson or rector of Hawick. He is frequently styled Sir William Fowler, but there is no evidence that he was ever knighted. That Fowler was a man of very superior literary merit is evinced by his works, which are still preserved. The first of these is a collection of sonnets entitled *The Tarantula of Love;* the other is a translation from the Italian of the *Triumphs of Petrarch.* These two manuscripts were presented by his nephew, Drummond of Hawthornden, to the library of the university of Edinburgh in 1626, and it is understood both will shortly be published. Fowler was a great favorite at court. He prefixed a panegyrical sonnet to *The Furies*, a composition of James VI., while the king in return performed a similar office for his *Triumphs of Petrarch*, in a strain of versification which for vigor and fluency was vastly superior to his common style. Besides the above, two volumes of his manuscript notes, scrolls of poems, etc., are preserved among the Drummond MSS., in the library of the Society of Antiquaries of Scotland. Specimens of Fowler's verses were published in 1823 by Leyden in his *Scottish Descriptive Poems*, and are also to be found in other collections illustrating the poetry of the period.

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[1] Like *Deer* (Danish *Dyr*, German *Thier*). *Beast*, too, with some men has almost attained as much specialization.

FOWNES, George (1815–1849), Ph.D., F.R.S., an eminent chemist, was born in London. He early showed an interest in scientific pursuits, and when seventeen or eighteen years of age joined with Dr. Henry Watts and Mr. Everett in establishing a philosophical class at the Western Literary Institution in Leicester Square. In 1837 he entered the laboratory of Everett, lecturer on chemistry at the Middlesex Hospital; and in 1839 he studied for some time under Professor Liebig at Giessen. He was lecturer on chemistry first at the Charing Cross and then at the Middlesex Hospital Medical School, as also at the school of the Pharmaceutical Society. In 1845 he was appointed director of the Birkbeck Chemical Laboratory in University College, London. He died of consumption, January 31, 1849. Besides his well-known and frequently re-edited *Manual of Chemistry*, and the Acton prize essay of the Royal Institution, entitled *Chemistry, as exemplifying the Wisdom and Beneficence of God*, Fownes wrote numerous scientific papers, among others the following:—

"On the Direct Formation of Cyanogen from its Elements," *Rep. Brit. Assoc.*, 1841, part ii. pp. 52, 53; "On the Preparation of Artificial Yeast," *Mem. Chem. Soc.*, i., 1841–43, pp. 100–103; "On the Preparation of Hippuric Acid," *Phil. Mag.*, xxi. 1842. pp. 382–384; "On the Food of Plants [prize essay], *Journ. Agric. Soc.*, iv., 1843, pp. 498–556; "On the Existence of Phosphoric Acid in Rocks of Igneous Origin," *Phil. Trans.*, 1844, pp. 53–56; "An Account of the Artificial Formation of a Vegeto-alkali" (Furfurol), and "On Benzoline," *ib.*, 1845, pp. 253–268; "On the Production of Furfurol," *Pharm. Journ.*, 1849, 113–116; "On the Equivalent or Combining Volumes of Solid Bodies," *ib.*, pp. 334–339.

FOX (*Vulpes*), a genus of digitigrade Carnivora, belonging to the *Canidæ* or dog family, but differing from the true dogs (*Canis*) in the greater elongation and sharpness of the muzzle, and in the greater length and bushiness of the tail. They likewise differ in the pupil of the eye being elliptical when contracted, and in the possession of a subcaudal gland, in which a fetid substance is secreted, the emission of which gives to foxes their peculiarly disagreeable odor. There are 24 recent species of foxes known, distributed over all the great continents except South America and Australia. Of these the Fennec foxes are exclusively African, and the bristle-tailed foxes North American. The Common Fox (*Vulpes vulgaris*), the pet of the hunting field and the pest of the farmyard, occurs throughout Europe, wherever it has not been exterminated by man. It is the Scottish *tod* and the French *renard*. It measures about two feet in length exclusive of the tail, which is about a foot long. Its fur is of a reddish-brown color above, and more or less white beneath; the back of its ears and the fore part of its limbs are black, and the tip of its bushy tail, or brush as it is called, is white. Its long, sharp muzzle, erect pointed ears, and sharp eye give it an appearance of sagacity and cunning which its real character fully justifies. The fox is undoubtedly the subtlest of British beasts of the field, its intellectual capacity having no doubt been enlarged by the peculiarly hard conditions under which alone it is permitted to exist in this country. It is regularly hunted by the fleet and keen-scented fox-hounds, urged on by mounted huntsmen, all of whom are not unfrequently baffled by the speed, cunning, and ingenuity of this wily creature. The fox is a solitary animal, inhabiting a burrow known as its earth, which it either excavates for itself, or, as more usually happens, obtains by previously ejecting the badger or the rabbit from its home. So averse, indeed, is the fox to dig for itself, that when foiled in its attempts to dispossess the badger, it has been known to take up its quarters with the latter, and in Germany it is readily induced to make its home in artificial burrows, constructed of stone and earth for the purpose of facilitating the operation of digging out the cubs. The fox also occurs in woods, and even in the open country without burrows, lying in its "cover" by day and stealing forth at night, when alone it can be said to see properly in search of its prey. Its food consists of rabbits, hares, poultry, and game-birds, although when these are not to be had it is fain to satisfy its hunger with rats, mice, and even insects—"the droppings of these creatures," says Bell, "being often composed almost entirely of the wing cases of beetles." The fox also visits the sea-shore, where it feeds on shell-fish and crustaceans; and on the Continent it is said to frequent the vineyards in order to gratify its taste for ripe grapes. Although the flesh of most birds forms its favorite food, it is a curious circumstance, noticed by Dr. Weissenborn, that even the severest hunger cannot compel it to eat the flesh of birds of prey, while there is good reason to believe that the fox enjoys, if it does not even prefer, "high" meat. The female produces her young in April—the period of gestation extending from 60 to 65 days. These are usually from 5 to 8 in number, and for them she shows the greatest solicitude, defending them with the utmost courage, and exhibiting a boldness altogether foreign to her character at other times. The cubs attain their full size in about 18 months, and the duration of life in the species, judging from individuals kept in confinement, probably extends to 13 or 14 years. The cubs, like those of most Carnivora, are exceedingly playful, and may often be seen amusing themselves, after the manner of young dogs, in pursuit of their own brushes. Their resemblance to the dog does not, however, extend much further, for, unlike it, they seem incapable of attachment to man. Although taken young and brought up with dogs, their attachment does not go beyond refraining from biting the hand that is accustomed to feed them. They remain timid and suspicious, and are always ready to snap at any one seeking to be familiar. This incapability of domestication, and the fact that the dog and fox have never been known to interbreed, would seem to prove that these animals are by no means so nearly related as was at one time supposed. Ample proof of the very considerable intellectual capacity of the fox is to be found in the stratagems to which it has recourse in securing its prey, but still more in the quickness with which it detects man's strategic efforts to outwit and capture it. "Its instinctive cunning," says Bell, "leads it soon to suspect the wiles of its enemies, and it will in a very short time ascertain the design of a trap or a gin, though concealed with the utmost care." Nothing can exceed the caution with which reynard approaches and examines the baited trap, or the *nonchalance* with which he approaches, enters, and rifles the snare in which some animal has been already caught, and which he evidently knows can do him no injury until reset. There are also several well-authenticated cases of the fox counterfeiting death in order to escape from its enemies. Attempts have been made to put a different interpretation on such instances, but examples of "feigning" have of late years been noticed in so many and such diverse animals,—among insects, reptiles, birds, and mammals,—that there seems no reason to doubt that the wily fox has recourse to a stratagem which, for want of a better term, may be described as counterfeiting death.

Closely allied to the common fox of Europe is the Red Fox (*Vulpes fulvus*) of eastern North America, regarded by many naturalists as only a variety of the common species—an opinion which receives some confirmation from the fact that hitherto no remains of the red fox have been found in the cave deposits of that continent, although remains of the gray fox are abundant. It may thus possibly be the descendant of individuals of the European species, introduced at a comparatively early period, and owing the differences that now distinguish it to the greatly altered conditions under which for centuries it has existed. It is altogether larger than the common fox of Europe, and the fur is longer and softer, the color more brilliant, and the muzzle less extended. According to Sir J. Richardson, it preys largely on the smaller animals of the rat family, and is very fond of fish. "The red fox," he says, "does not possess the wind of its English congener. It runs for about 100 yards with great swiftness, but its strength is exhausted in the first burst, and it is soon overtaken by a wolf or a mounted horseman." In Canada and the United States it is largely hunted for its valuable fur, about 60,000 skins of this species being annually imported into the London market. There are several well-known varieties of the red fox, as the cross fox and the black or silver fox. The latter is very scarce, and its fur is more valuable than any other found in North America. La Hontan states that in his time a skin of the silver fox was worth its weight in gold, and an unusually fine skin has been sold in the London market for £50. The fur is sometimes of a uniform black shining color, except at the tip of the tail, which is white; but more usually it has a hoary appearance from the admixture of white tipped hairs with those entirely black. This fox is exceedingly shy and difficult of approach, owing probably to the persistency with which it is hunted by the fur traders. About 1600 skins of the silver fox are annually imported into Britain. The Arctic fox (*Vulpes lagopus*) is an inhabitant of the boreal regions of Europe, Asia, and America. It is somewhat smaller than the

European fox, its ears being less pointed and the muzzle shorter. The soles of its feet are densely furred, resembling those of a hare, hence its specific name, *lagopus*. As with many Arctic animals the color of its fur changes with the season, being in most cases of a pure white color in winter, with the exception of a few black hairs at the extremity of the tail. Towards the end of April, however, when the Arctic snows begin to disappear, the long white fur gives place to shorter hair of a dark brown or sooty color. Occasionally a dark-colored fox may be seen in winter, and a white one in summer, and in Iceland, according to Professor Newton, the winter coat differs very slightly in color from that of summer, probably owing to the comparatively mild character of the Icelandic winter. The Arctic fox has little of the proverbial cunning of its kind, having been seen to walk unsuspiciously into the trap which had been baited in its presence. It is an exceedingly cleanly animal, and the fetid odor characteristic of the entire genus is almost absent in this species. It differs also from the common fox in being gregarious, living, according to Richardson, in little villages consisting of 20 or 30 burrows placed near each other. The Arctic foxes seek their food, which consists of lemmings, birds, eggs, and carrion, at night, and their first impulse, says Captain Lyon, on securing it is to hide it, even though suffering severely from hunger. It was suggested some years ago by Professor Newton that this species supported itself during winter on a store of provisions laid up during summer, and Captain Feilden was able during the recent polar expedition (1875) to confirm this. When in Grinnell Land he and his companions came upon Arctic foxes, and were greatly surprised on discovering numerous deposits of dead lemmings. "In one nook," says Captain Feilden, "under a rock we pulled out over 50; we disturbed numerous *caches* of 20 and 30, and the ground was honeycombed with holes, each of which contained several bodies of these little animals, a small quantity of earth being placed over them" (*A Voyage to the Polar Sea*, by Captain Sir G. Nares, 1878). Nearly 10,000 skins of the Arctic fox, chiefly in winter fur, are annually brought into Britain.

Foxes are found fossil in caverns in many parts of Europe, and extinct species occur in the Tertiary deposits of both hemispheres. (J. G. I.)

FOX, Charles James (1749–1806), born on the 24th of January, 1749, at 9 Conduit Street, in the city of Westminster, was the third son of Henry Fox, first Lord Holland. His mother was the eldest daughter of the second duke of Richmond. As his great-great-grandmother was duchess of Portsmouth, he had in his veins the blood of Charles II. of England and Henry IV. of France. His paternal grandfather, Sir Stephen Fox, was born shortly after Charles I. ascended the throne, and died shortly after the accession of George I. The public services of this member of the Fox family have received less notice than they deserve. He was a yeoman's son who, having been taught to read, write, and cipher, was considered capable of rising in the world. When a youth he first obtained a situation in the household of the earl of Northumberland; then he entered the service of Lord Percy, the earl's brother, and he was present with the royalist army at the battle of Worcester as Lord Percy's deputy at the ordnance board. Accompanying Charles II. in his flight to the Continent, he served him in a menial capacity during his exile, till he was promoted to be keeper of the privy purse. He was employed as intermediary between the king and General Monk. Honors and emolument were his reward after the Restoration; he was knighted, and appointed to the lucrative offices of clerk of the green cloth and paymaster of the forces. He entered the House of Commons, first as member for Salisbury, and secondly for Westminster. He succeeded the earl of Rochester as a commissioner of the treasury, filling that office for 23 years and during three reigns. At the mature age of seventy-seven he married for the second time; four children were the issue of this marriage. He died in 1716 at the age of eighty-nine, and left a large fortune. It is his distinction to have founded Chelsea hospital, and to have contributed £13,000 in aid of this laudable public work. Though his place as a statesman is in the second or even the third rank, yet he was a useful man in his generation, and a public servant who creditably discharged all the duties with which he was entrusted. Unlike other statesmen of his day, he grew rich in the service of the nation without being suspected of corruption, and without forfeiting the esteem of his contemporaries. Sir Stephen Fox's second son by his second marriage was named Henry. Inheriting a large share of the riches which his father had accumulated, he squandered it soon after attaining his majority. Henry Fox went to the Continent to escape from his creditors. There he made the acquaintance of a countrywoman of fortune, who became his patroness and was so lavish with her purse that, after several years' absence, he was in a position to return home and to enter parliament as member for Hindon. He became the favorite pupil and devoted supporter of Sir Robert Walpole, achieving unequalled and unenviable proficiency in the worst political arts of his master and model. As a speaker he was fluent and self-possessed, imperturbable under attack, audacious in exposition or retort, and able to hold his own against Pitt himself. Thus he made himself a power in the House of Commons, and an indispensable member of several administrations. He heaped up riches when acting as paymaster of the forces during the war which Pitt conducted with extraordinary vigor, and in which the nation was intoxicated with glory. He served under the earl of Bute in order that he might exercise his skill in cajolery and corruption to induce the House of Commons to approve of the treaty of Paris; as a recompense, he was raised to the House of Lords with the title of Baron Holland. He strove, but in vain, to obtain promotion to the dignity of an earl, a dignity upon which he had set his heart, and he died a sorely disappointed man, with a reputation for cunning and unscrupulousness which cannot easily be matched, and with an unpopularity which justifies the conclusion that he was the most thoroughly hated statesman of his day. Henry Fox's affection for his son Charles James verged on idolatry. The boy was both precocious and engaging. Whatever he chose to learn, he acquired with ease, and he displayed more than a boy's good sense in correcting his faults. Once he overheard his mother, with whom he was no favorite, remark to his father, "Charles is dreadfully passionate; what shall we do with him?" and the reply, "Oh, never mind; he is a very sensible little fellow, and he will learn to cure himself." Thereupon he resolved to repress his angry passions, and he succeeded in rendering himself a pattern for gentle bearing and command of temper. He went to Eton when he was nine, having spent the preceding year, at his own request, in the school kept at Wandsworth by Pampelonne a French refugee. The boy's health was delicate, and this caused his father much anxiety. He was not diligent in learning, nor was his tendency towards indolence at school counteracted by the discipline to which he was subjected. The Rev. Dr. Francis, his tutor, sent to his father accounts more flattering than just of his son's progress and attention, and better fitted to gratify parental fondness than set forth the truth. He often went home in order to accompany his parents to some notable spectacle, chief among them being the coronation of George III., where he met with a slight accident, which, being reported in the newspapers, caused his father to write, "The article [in the newspapers] of Charles's mishap has brought several messages. The boy is a great deal better beloved than his father is." When fourteen he left school for four months, which he spent with his parents at Spa and Paris. His father taught him to game at Spa, giving him several gold pieces wherewith to try his luck, as the saying is, every evening. Hence he early became addicted to the vice which was for some years his besetting sin, and for which he could urge no other excuse, when taunted with it later by Lord Hillsborough in the House of Commons, than that it was a vice "countenanced by the fashion of the times, a vice to which some of the greatest characters had given way in the early part of their lives, and a vice which carried with it its own punishment, and entailed a curse upon those who were addicted to it." He returned to Eton thinking himself a thorough young man of the world; but his dandified airs only excited the ridicule of his comrades, and Dr. Barnard, the head master, by flogging him for misconduct, made him feel keenly that he was still a mere schoolboy. More instructive and advantageous than trips to the Continent and visits to Continental gaming houses were the visits which he made to the Houses of Parliament, in company with his father, to hear important debates. He was in the gallery of the House of Commons when Lord North moved "that the paper entitled the *North Briton* is a false, scandalous, and seditious libel." His father impressed upon him that John Wilkes was a bad man, and that the earl of Bute was a sagacious minister; these opinions were embodied by him in some French verses, which injudicious admirers have reproduced to show his want of mastery over the French language, and the absurdity of his boyish political sentiments. Leaving Eton in 1764, Fox went to Oxford, where he entered Hertford College. In a letter to his friend Mr. Macartney he professed a great liking for Oxford and fondness for mathematics, adding, in another letter, that he believed mathematics were useful, and was sure they were entertaining, this being enough, in his opinion, to recommend them. The same letter contained his judgment on a newly published poem, which is far less paradoxical and more creditable to his discernment than the foregoing statement concerning mathematics. The poem was the *Traveller*, which the youthful critic pronounced, with perfect truth, "to have a good deal of merit." A trip to Paris and a stay there of two months interrupted Fox's university career. Dr. Newcome, the head of his college, readily sanctioned this holiday, making the complimentary remark that such application as his required "some intermission, and you are the only person with whom I have ever had connection to whom I could say this. . . . You need not interrupt your amusements by severe studies; for it is wholly unnecessary to make a step onward without you, and therefore we shall stop until we have the pleasure of your company." This visit to the capital of France was no more serviceable to him, in a moral sense, than his previous one. His father encouraged him to indulge himself without stint in pleasures to which young men are only too prone, and, what is still more blameworthy, jested at the scruples of a son who had no strong liking for vicious courses. On his return to Oxford he worked hard at his studies, spending the greater part of a vacation in systematic reading along with his friend Dickson, who was afterwards bishop of Down. Their leisure was devoted to perusing the works of the early English dramatists, all of which they read. Taking his degree in 1766, he left Oxford and spent the succeeding two years in Continental travel, traversing France and Italy, either in company with his parents, or else with his friends Lord Carlisle, Lord Fitzwilliam, and Mr. Uvedale Price. Along with Mr. Price he visited Voltaire at Ferney, where he was heartily welcomed by the great Frenchman for his father's sake, and was advised to read Voltaire's published works in order that he might emancipate himself from religious prejudices and increase his stock of ideas. He became a proficient in speaking the French tongue, and he practised himself in writing it by penning poetical epistles in French to his friend Fitzpatrick. He also mastered Italian, which he admired beyond measure, saying that there was "more good poetry in Italian than in all other languages that I understand put together." He was then passionately fond of amateur acting and of wearing fine clothes. In after days his friends could scarcely credit the assurance of the friends of his youth when the latter stated that Fox, who had become a sloven in dress, was once a "macaroni," having made a journey from Paris to Lyons in order to buy waistcoats, and was in the habit of walking about with a little French hat on his head and red-heeled shoes on his feet. As difficult was it for some among them to realize that Fox, the leader of the Whigs, and even further advanced in Liberal opinions than the majority of his party, had been such a Tory at the outset of his parliamentary career as to write to George Selwyn in the following terms: "I am reading Clarendon, but scarcely get on faster than you did with your Charles V. I think the style bad, and that he has a great deal of the old woman in his way of thinking, but hate the opposite party so much that it gives one a kind of partiality for him." Hating the opposite party so thoroughly, it is not surprising that he should have been inimical to the first administration of the marquis of Rockingham, an administration that repealed the Stamp Act which George Grenville had designed to raise a revenue in the American Colonies, an administration which was far too liberal in tendency and independent in character to suit the narrow and personal views of George III., and that he should have written to Sir George Macartney, "everybody laughs at its members, holds them cheap, but, according to the fashionable phrase, doing justice to their good *intentions*." In 1768, when still under age, Fox was returned for Midhurst, then a pocket borough. His father having made the arrangements necessary for his election had thereby provided a supporter of the ministry of the day which the earl of Chatham had formed, and in which the duke of Grafton was first lord of the treasury. Fox's maiden speech in the House of Commons was delivered in defence of the ministry and in opposition to seating John Wilkes as member for Middlesex. He at once made his mark as a parliamentary speaker, recalling to some members the best traits of Charles Townshend and the elder Pitt. His father, delighted at the success achieved by his favorite son, communicated his satisfaction to his acquaintances, and wrote to one of them that he had been told Charles had spoken extremely well:—"It was all off-hand, all argumentative, in reply to Mr. Burke and Mr. Wedderburn, and excessively well indeed. I hear it spoken of by everybody as a most extraordinary thing, and I am, you see, not a little pleased with it." Fox had his reward by being appointed a lord of the admiralty immediately after attaining his majority, and when Lord North had succeeded the duke of Grafton as prime minister. Two years afterwards he resigned, on account of a misunderstanding with his chief and a determination to oppose the Royal Marriage Bill, which the ministry introduced out of deference to George III., and about which the king wrote to Lord North:—"I do expect every nerve to be strained to carry the Bill through both Houses with a becoming firmness, for it is not a question that immediately relates to administration, but personally to myself; therefore I have a right to expect a hearty support from every one in my service, and shall remember defaulters." Fox not only opposed this bill, which was framed to discourage members of the royal family from marrying, and to throw artificial obstacles in their way should they desire to make love matches, but he also introduced a bill to amend Lord Hardwicke's Act, "For the better preventing of Clandestine Marriages," which his father had virulently opposed. This conduct, which gave great offence to George III., was the origin of that implacable enmity to his great subject which ever after prevailed in the royal breast, to the detriment alike of the throne and the country. In introducing his bill Fox is said by Horace Walpole to have spoken "with ease, grace, and clearness;" he effectively answered Edmund Burke and Lord North who opposed it, ridiculing the arguments of the former and confuting those of the latter, "with a shrewdness that, from its multiplicity of reasons, as much exceeded his father in embracing all the arguments of his antagonists as he did in his manner and delivery." This was doubly agreeable to his father, who had formed a clandestine marriage, and who thought such an Act as Lord Hardwicke's a slur upon himself. The attempt of his son failed, though he had the triumph of beating the ministry by a majority of one on a motion for leave to introduce the bill. After being a year out of office, he became reconciled to Lord North, and re-entered the administration as a junior lord of the treasury. But he soon reasserted his independence, differing from Lord North on a question of procedure, and causing the defeat of the ministry in the House of Commons by pressing an unwelcome motion to a division. The king was incensed at what he styled Charles Fox's presumption, adding, in a letter to the premier, "Indeed, that young man has so thoroughly cast off every principle of common honor and honesty that he must become as contemptible as he is odious; and I hope you will let him know you are not insensible of his conduct towards you." Lord North, acting in conformity with the king's suggestion, wrote as follows to Fox:—"Sir, his Majesty has thought proper to order a new commission of the treasury to be made out, in which I do not see your name." Thus ended the first stage of Fox's political career. A year later he avowed in the House of Commons that "the greatest folly of his life was in having supported Lord North." He was chargeable with follies of another kind. Among the young men of the day he was conspicuous for staking money at play and making bets on horse races. Sometimes he won bets made at Newmarket, but he almost invariably lost larger sums in a gaming club at Almack's, where the stakes were £50, and where as much as £10,000 was on the table at a time. Lord Holland advanced £40,000 to pay his debts, but this did not suffice, and he became the dupe of a Mrs. Grieve, who, on the pretext of introducing him to a Miss Phipps, a West Indian heiress, obtained money from him. His reputation stood so low in public estimation that, according to Horace Walpole, it was commonly supposed he had been dismissed by Lord North for robbing the treasury. In 1774 Fox began that opposition to the ill-advised and ill-fated measures of Lord North which gave him a place among the greatest of orators and the most prescient of statesmen. He lost both his parents in that year, and his brother Stephen, second Lord Holland, soon followed them to the grave, leaving behind him the boy whom Fox treated with almost paternal fondness and care, whose memory as third Lord Holland is held in kindly remembrance, and who, with characteristic modesty, considered it his chief glory to have been the nephew of Fox and friend of Grey. Soon after Fox entered the ranks of the Opposition he became its acknowledged chief. This rapid advancement was largely due to the lessons in practical politics taught him by Edmund Burke, whose acquaintance he had made in early life. The story of his career from 1774, when he left Lord North's administration, to 1782, when Lord North resigned and when he became secretary of state in the second Rockingham administration, is associated with the unsparing and brilliant opposition of the Whig party to the war which ended with the ratification of the independence of the Thirteen United Colonies of America. An important episode during that period was his election as member for the city of Westminster. On the 2d of February, 1780, a meeting in favor of parliamentary reform was held in Westminster Hall, at which such leading members of the Whig party were present as the duke of Portland, Earl Temple, John Wilkes, General Burgoyne, Alderman Sawbridge, Edmund Burke, and over which Fox presided. He delivered a stirring speech in favor of a redress of grievances, and in particular of a reform in the representation of the people. After it had been resolved that a petition to that effect should be presented to parliament, it was proposed and carried by acclamation that Fox, "the Man of the People," should become a candidate to represent Westminster in the House of Commons, and before the year closed he was a member for the constituency which he represented till the end of his life. A little more than a century had then elapsed since Sir Stephen Fox, his grandfather, had been first returned for the city of Westminster. George III. encouraged the opposition to the election of the "Man of the People," of whom he wrote that "Fox never had any principle, and can therefore act as his interest may guide him." Eight thousand pounds were contributed out of the civil list to promote the success of Lord Lincoln, the favorite of the court, yet neither corrupt expenditure nor royal disapproval sufficed to hinder the triumph of Fox. As secretary of state in the ministry of the Marquis of Rockingham, and leader of the House of Commons, Fox displayed great business aptitude and capacity for conciliation. A short time before he became minister, Horace Walpole wrote to Sir Horace Mann:—"Mr. Fox is the first figure in all the places I have mentioned,—the hero in parliament, at the gaming-table, at Newmarket." After he became minister, the same writer informed his correspondent—"Mr. Fox already shines as greatly in place as he did in opposition, though infinitely more difficult a task. He is now as indefatigable as he was idle. He has perfect temper, and not only good humor but good nature, and, which is the first quality of a prime minister in a free country, has more common sense than any man, with amazing parts that are neither ostentatious nor affected." His experience of high office was very short. Lord Rockingham became premier on the 27th of March, 1782; he died on the first of the following July, and Fox resigned immediately afterwards. He had finally resolved to do so before the death of his chief, having been outvoted in the cabinet on the question of unconditionally acknowledging the independence of the United Colonies. His brother secretary of state, the earl of Shelburne, and other colleagues thought that the concession of independence should be made one of the conditions of peace. Fox regarded Shelburne with undisguised aversion. When the administration was formed, he fancied that Shelburne was disposed to imitate Lord North and to pay undue deference to George III., and he told him that it appeared "the administration was to consist of two parts, one belonging to the king, the other to the public." Four weeks after being in office Fox wrote to his friend Fitzpatrick:—"Shelburne shows himself more and more every day, is ridiculously jealous of my encroaching on his department, and wishes very much to encroach upon mine." Shelburne, in turn, suspected Fox of designs to monopolize power, and to have his own way in all things. This unfortunate antagonism between two men of remarkable ability caused a split in the Whig party, and enabled the king to succeed in his policy of entrusting power only to ministers who were subservient to his will. Succeeding Lord Rockingham as premier, Shelburne held office till the 24th February, 1783. The coalition ministry, in which the duke of Portland was premier, and Lord North and Fox were secretaries of state, took the place of that over which Shelburne had presided. It was with extreme and undisguised reluctance that the king permitted this administration to be formed. When he found it hopeless to struggle against the inevitable result, he communicated his real feelings on the subject to those politicians who prided themselves upon being his friends. In conversation with Mr. Wyndham Grenville, he poured out his indignation "upon Fox, whom he loaded with every expression of abhorrence; upon the duke of Portland, against whom he was little less violent; upon Lord North, to whose conduct he imputed all the disasters of the country; upon American independence, which seemed to have been a most bitter pill indeed." His early detestation of Fox had now been intensified, owing to the unnatural behavior of his eldest son, which he erroneously attributed to the teaching of the great Whig statesman. The king even consulted Lord Chancellor Thurlow and Lord Ashburton as to "what redress he could have against a man who alienated from him the affections of his son," and it is said that Thurlow told him "he would have no peace till his son and Fox were secured in the Tower." One of the first acts of the coalition was to arrange about the establishment and income of the Prince of Wales. The king was shocked at the proposition which the ministry laid before him, considering the sum which had been agreed upon as a fitting one for the prince to receive utterly extravagant; and he alleged that his advisers were ready to sacrifice the public interests to gratify an "ill-advised young man." In consequence of the king's disapproval of the scheme, his eldest son had to content himself with an allowance which was wholly inadequate; hence he had to make repeated applications to parliament to pay his debts. While the coalition ministry held office the definitive treaties of peace were signed between Great Britain and France, Spain, and the United States of America, and thus the war which a ministry after George III.'s own heart had provoked and carried on with amazing incompetence ceased to impoverish and humiliate the nation. But the chief act of the administration and the cause of its downfall was the introduction of a bill for the just and efficient government of British India. Though Burke had the principal share in planning the measure, yet Fox, having made himself thoroughly master of the questions at issue, expounded the scheme in the House of Commons with great lucidity and impressiveness. The opposition to it was vehement and disingenuous; the measure was falsely described as having been solely designed in order to confiscate the property of the East India Company and establish the supremacy of the Whig party. William Pitt, who was then unsparing and unfair in his criticism, afterwards did practical justice to the wisdom of Fox and his colleagues by bringing a measure into parliament resembling that of the coalition ministry in many essential particulars. Fox's prediction was thus verified, for the day arrived when his statesmanlike and much maligned bill was "regarded in its true light as a strong, but as a necessary and a just measure." But the king had determined that the bill which Fox had safely piloted through the House of Commons should never pass into law; several persons calling themselves his friends aided him in accomplishing his object, and the ministry, after being defeated by a small majority in the House of Lords, was summarily and contemptuously dismissed. Twenty-two years elapsed before Fox returned to office.

During three months after his dismissal, Fox endeavored to counteract the power of the sovereign to dissolve parliament; but he was baffled by the boldness and patience of William Pitt, the young prime minister. Then followed a more trying discomfiture when the country pronounced in favor of his rival at the general election of 1784. Even the Nonconformists, who had no warmer advocate than Fox, and whose only hope for the redress of intolerable grievances consisted in the Whig party being in office, turned against their true friends, rallying to the shout of "Pitt and the constitution," instead of aiding by voice and vote the cause of "Fox and free government." They deserted him at a critical juncture. Nevertheless he continued to plead for them with his whole heart and soul, and merely remarked, "on recollection of what had been their conduct upon that occasion [the coalition], the House would at least do him the justice to say that, in supporting them that day, he was not influenced by any very obvious motives of private partiality or attachment. Yet he was determined to let them know that, though they could upon some occasions lose sight of their principles of liberty, he would not upon any occasion lose sight of his principles of toleration." It was not enough for the king and the young and haughty premier that the Whig party should be defeated in the country; they were resolved to exclude Fox from parliament, and in any case to prevent his re-election for Westminster. Admiral Lord Hood, Sir Cecil Wray, and Fox were the candidates for the two seats. The court and the ministry were bent upon the first two being chosen. What the king styled "gold pills" were lavished on the occasion. Moreover, 280 of the Guards were sent to vote as householders, a thing which Horace Walpole said his father "in the most quiet season would not have dared to do." The character of the struggle recalled an envenomed contest 89 years previously, when the Jacobites strove with all their might to hinder the re-election of Sir Stephen Fox, a declared supporter of the Revolution settlement. In 1784, as in 1695, the party of freedom and constitutional government carried the day in Westminster, and Fox was returned by a majority of 236. But the partisans of divine right in 1695 never dreamed of retrieving their defeat in the manner which found favor in the eyes of George III. and his advisers in 1784. A scrutiny was demanded, in order that Fox might not take his seat. Happily, this pettifogging manœuvre was thwarted by the action of attached friends, who procured his election for the Kirkwall burghs. The validity of this election was challenged, but without result, and Fox was able to make that impassioned and masterly protest in the House of Commons against the shameful treatment to which he had been subjected, which is known as his speech on the Westminster scrutiny, and which ranks among the best speeches ever delivered in parliament. The scrutiny went on for a year, till even Pitt's docile majority resented the further continuance of the unconstitutional farce, and voted that it should end. In consequence of this Fox took his seat as member for Westminster, brought an action against the high bailiff, who had conducted himself in the affair as a tool of the ministry, and recovered £2000 damages, which he distributed among the Westminster charities. The remainder of Fox's parliamentary career is more remarkable for eloquent speeches than for stirring personal incident. His criticism of Pitt's measures was always shrewd and vigorous, though not invariably just. He blundered most seriously in denouncing the commercial treaty with France, a scheme of far-seeing policy and admirable patriotism. When this subject was debated he gave utterance to a phrase which, like the utterances of many other notable men, has been repeated to his discredit by persons who, purposely or inadvertently, dissociate it from the context, and withhold the qualifying clauses. Having said that "France was the natural political enemy of Great Britain," he was reproached for calling the French the natural enemies of the English. What he meant to convey was, not that enmity necessarily existed between the English and the French, but that the policy of France, as directed by the house of Bourbon, was irreconcilably opposed to the interests of England, a proposition which was really incontrovertible. His liking for the French people was extreme, and this was openly displayed so soon as they had emancipated themselves from a rule which they detested, and which rendered them the disturbers of the world. Then he avowed his conviction that the new form of government in France "would render her a better neighbor, and less disposed to hostility, than when she was subject to the cabal and intrigues of ambitious and interested statesmen." Again, it is forgotten or concealed by those persons who have censured Fox on account of his objection to this treaty, "that he earnestly recommended, instead of the present treaty, a more intimate connection with the United States of America, such an intercourse for Britain that could be devised, and was entirely consistent with her true political interests, and such an intercourse he had the best reason for believing America was both willing and eager to enter into upon fair and equitable terms." Indeed, Washington was anxious to conclude a commercial treaty with Great Britain, but Pitt discountenanced the notion. It was wise in Fox to urge this as most desirable, yet he would have shown still greater wisdom in aiding to the utmost the project for increasing commercial intercourse with France also. On other questions he displayed genuine liberality of sentiment and the highest statesmanship. He declared emphatically against the slave trade at a time when Pitt took credit for delivering no opinion in favor or in disapproval of the traffic in negroes. He repeatedly moved for the repeal of the Test and Corporation Acts, and he advocated a thorough-going scheme of parliamentary reform. He was one of the managers when Warren Hastings was impeached by the Commons of England of high crimes and misdemeanors; he had mastered the subject, spoke on it in a more businesslike, though less rhetorical and sensational style than Burke and Sheridan, while his judgment was accepted as conclusive when his brother managers differed in opinion. His health being impaired, he went to the Continent in 1788 for relaxation and change, revisiting Switzerland and Italy. He spent a short time with Gibbon at Lausanne. The luminous historian has chronicled the pleasure which he reaped from this visit of the illustrious statesman; how they conversed without ceasing from morning to night, adding, "we had little politics; though Fox gave me in a few words such a character of Pitt as one great man should give of another his rival; much of books, from my own, on which he flattered me very pleasantly, to Homer and the *Arabian Nights;* much about the country, my garden (which he understands far better than I do); and upon the whole I think he envies me, and would do so were he a minister." At Bologna, in November, 1788, he received an urgent summons to return home, owing to the meeting of parliament on the 20th of that month having been rendered necessary on account of the king's sudden and serious illness. While journeying to England he heard a report that George III. was dead, being the truth that the monarch had been suddenly bereft of his reason. Travelling with all the speed possible in those days, Fox arrived in London on the ninth day after leaving Bologna. He had gone abroad for his health; the journey back nearly killed him. Wraxall says that Fox's appearance when he entered the House of Commons on the 4th of December, "excited a great and general sensation. I never saw him, either previously or subsequently, exhibit so broken and shattered an aspect. His body seemed to be emaciated, his countenance sallow and sickly, his eyes swollen; while his stockings hung upon his legs, and he rather dragged himself along, than walked up the floor to take his seat." Both Pitt and he made mistakes during the debates on the regency, both thinking less of what was best to be done in the circumstances than about the most suitable course to pursue for the purpose of securing the supremacy of their respective parties. Pitt dreaded the loss of office should the Prince of Wales become regent, with full power to conduct the government; Fox was confident that, if the prince exercised the royal prerogatives, a Whig administration would be constituted. The unexpected recovery of the king put an end alike to hopes of promotion and fears of dismissal; but the record of blunders which cannot be excused, and of aspirations which were wanting in patriotism, remained to sully the fame of Tory and Whig leaders. The divergence of opinion between the Whig and Tory parties, and among the members of the Whig party, grew wider, and more deplorable when the French Revolution agitated Europe and terrified many Englishmen. An outcry was raised against French principles, and against those persons who held that the surest way to avert danger to England was to remove all reasonable grounds for popular dissatisfaction. The mob of Birmingham, frenzied with panic and overflowing in loyalty, pillaged the houses of Dr. Priestley and other Nonconformists, in order to testify attachment to "church and king," a cry which Dr. Parr characterized as the toast of Jacobites and the yell of incendiaries, meaning, "a church without the gospel, and a king above the laws." Handbills circulated in the neighborhood where Fox dwelt contained the threat, "Destruction to Fox and his Jacobite crew." He expressed in the House of Commons his foreboding that his own dwelling might be dealt with in the same way as Dr. Priestley's, yet he persevered in upholding freedom of speech and of the press when the ministry carried the Traitorous Correspondence Act, the Seditious Practices Act, and the suspension of the Habeas Corpus Act. He too suffered for his attachment to liberal principles.

For proposing as a toast at the Whig club, "the sovereignty of the people of Great Britain," his name was expunged by the king from the list of privy councillors, at the special suggestion of Pitt. The duke of Norfolk had previously been subjected to the like indignity for having proposed on Fox's birthday the toast:—"Our sovereign's health; the majesty of the people." Finding it hopeless to struggle against the ministerial majority, which had been swelled by defections from the ranks of his own party and friends, he discontinued attending parliament in 1797, and spent his time at St. Anne's Hill in literary study and in writing a history of England from the reign of James II. The debts which had long embarrassed him were discharged by private friends in 1793, who settled an annuity of £3000 upon him. From that date he never touched a card. In 1795 he married Mrs. Armitstead, a lady with whom he had lived for some time. During this period he watched over the training of his nephew, the third Lord Holland, and prepared him for playing a useful part on the political stage. Immediately after the peace of Amiens he visited Paris, chiefly in order to examine the archives in the French foreign office for historical purposes. He visited Lafayette, and was cordially welcomed by the republican patriot, planting, in remembrance of his visit, the ivy which now mantles the turrets of the gateway at Lagrange. In common with other distinguished visitors to Paris, he was presented to Bonaparte. The war recommencing soon after his return home, he resumed his advocacy of peace; indeed, as the poet has truly said of this stage in his career, "peace, when he spoke, was ever on his tongue." Another feature of it was a complete understanding with the marquis of Lansdowne, formerly earl of Shelburne, on questions of foreign policy, the two acting in concert when any such matter was under debate in either House of Parliament.

Pitt died in January, 1806. The ministry of "All the Talents" was then formed, with Lord Grenville as first lord of the Treasury and Fox as secretary of state, despite the aversion and resistance of George III. Though loving peace as much as ever, he was yet ready to resist the inordinate pretensions of Bonaparte, and he declared war against Prussia when that power, acting as the vassal of the French conqueror and at his suggestion, annexed Hanover. Fox's last appearance in the House of Commons was on the 10th of June, 1806. Feeble in health, he appeared there at the risk of his life; but he could not forbear making a special effort in order to move resolutions preparatory to introducing a bill for the suppression of the slave trade. The resolutions were carried by large majorities in both Houses. The bill giving effect to them became law the following year. In this, his farewell speech, he said, "So fully am I impressed with the vast importance and necessity of attaining what will be the object of my motion this night, that if, during the almost forty years that I have had the honor of a seat in parliament, I had been so fortunate as to accomplish that, and that only, I should think I had done enough, and could retire from public life with comfort, and the conscious satisfaction that I had done my duty." On the 13th of the following September, he died, at the age of fifty-eight, of a schirrhous affection of the liver. The room in which he drew his last breath is in the duke of Devonshire's villa at Chiswick, and is the one wherein, at a later day, Canning died also. By Fox's death the country lost a statesman, who, despite his failings, is one of the finest and most fascinating figures in modern history,—a man who, in the phrase which Burke uttered six years after the friendship between them had ended, was "a man made to be loved," and of whom even George III., his single open and bitter enemy, said to Lord Sidmouth, "little did I think that I should ever live to regret Mr. Fox's death," and to his daughter Princess Mary, "I never thought I should have regretted the death of Mr. Fox as much as I do." Lamented by an unappreciative sovereign and by all discerning men, the mortal remains of the incomparable Whig statesman were carried in public funeral to Westminster Abbey, and laid alongside those of his brilliant and triumphant rival William Pitt.

It is not easy to determine the exact place which Fox would have held among English statesmen, if he had been allowed a suitable opportunity for the exercise and display of his talents. His name is associated with one great measure of practical legislation, the Act for amending the law of libel. Peace with the United States, the better government of India, the abolition of the slave trade, were some grand results of his untiring efforts and commanding advocacy. Scarcely any of the measures of reform carried into effect after his death had not been sanctioned and supported by him. Yet he performed but a small part of what he desired to accomplish. His fate had a close similarity to that of the earl of Shelburne, for whom, till a late period in his career, he felt a repugnance which was none the less unfortunate because it was reciprocated. Lord Shelburne, in common with Fox, was far in advance of his age. He neither dreaded the people nor overestimated their capacity. But he never had the chance of giving full effect to his convictions, and his best traits remained in obscurity till a descendant, with ample knowledge and admirable taste, has made them clear to the public of our day. Like Shelburne, the Whig commoner has been the victim of popular misunderstanding. His addiction to pleasure was considered by many contemporaries to be a fatal blot on his character. They argued in his case as Junius did in that of the duke of Grafton, who was denounced as an incompetent statesman because he appeared in public with Nancy Parsons, and was supposed to prefer the attractions of Newmarket to the sober business of cabinet councils. That the duke of Grafton was a man of exceptional capacity is now indisputable. Notwithstanding his liking for gaming and horse-racing, Fox was a thorough man of business, and a statesman for whom no work was too severe and no problem too difficult. The obstacles which Fox could not overcome, and which proved equal stumbling-blocks in Shelburne's path, were the dislike and distrust of George III. Yet, intensely as the king detested what he considered the Jesuitism of Shelburne, his feeling of antipathy to Fox was still more extreme and indefensible. This was due to aversion to his father, to the independence displayed by Fox when a member of Lord North's administration, and to the supposition that the undutiful behavior of his worthless eldest son was the result of Fox's direct influence and prompting. Charles Butler notes in his interesting miscellanies—"Cardinal de Retz said to a person who taunted him with the superiority of Cardinal Mazarin, 'Give me the king but for one day, and you'll see who has the real superiority.' Mr. Fox never had the king with him, even for one hour." When he was secretary of state in the coalition ministry, the king in his demeanor to him was "civil, but no more." The reason of this is obvious to all those persons who have studied George III.'s character. Not deficient in shrewdness, and abounding in the cunning which is the characteristic of men conscious and ashamed of their weakness of intellect, that monarch liked to have advisers who were not too strongly in contrast to himself, or else who would veil their capacity in their intercourse with him. A mere simpleton was as distasteful to him as a towering genius. Pitt, who liked to surround himself with dummies, had chosen Lord Hawkesbury to conduct foreign affairs. His incompetency being too conspicuous, the king told George Rose with gusto that, though the foreign ministers differed on many points, they were unanimous in their contempt and dislike for Lord Hawkesbury, and that "his lordship always approached him with a vacant grin, and had hardly ever anything business-like to say to him." In the presence of men of strong individuality and of great intellect, such as Chatham, Shelburne, and Fox, the king felt ill at ease, being conscious that his nominal servants were his real superiors. William Pitt pleased him, because Pitt, though a man of supreme talent and haughty to his equals and inferiors, was supple in the presence of his sovereign, and ready to defer to the sovereign's desires, to flatter his prejudices. Instead of impressing him with the opinion of the public on a given question, he professed anxiety to learn what his own view was in order to give effect to it. Once only did Pitt insist upon having his own way; failing, he resigned. But he returned to power on the clear understanding that he would not press the measure of justice to the Roman Catholics which he previously held to be necessary, and to which the king was sternly opposed. If George III. had deemed it possible that Fox would have been as submissive and considerate as Pitt, he would never have told George Rose that "he had taken a positive determination not to admit Mr. Fox into his councils, even at the hazard of a civil war," nor would he have written to Addington that "Mr. Fox is excluded by the express command of the king to Mr. Pitt." The wonder is that, despite the hindrances which were thrown in Fox's path, and the slight occasion which he had of proving in office how well fitted he was to discharge the most onerous tasks, he should yet have proved that no statesman of his age was better qualified for conducting the government of England. What Gibbon said of him during the war with the American colonies is applicable to his entire political career; he exhibited in the conduct of a party capacity for governing an empire.

It is unquestionable, that as a parliamentary orator, Fox has no superiors. Yet, notwithstanding many volumes contain his speeches, there is an insuperable difficulty in setting forth the secret of his oratorical greatness. One speech only is there printed as it was delivered, the single speech which he wrote out beforehand, being a eulogium on the deceased duke of Bedford. Another, that on the Westminster scrutiny, is said to have been reported with the accuracy which is now the rule. The records of Warren Hastings's trial comprise verbatim reports of the speeches which he delivered before the House of Lords. But no such evidence suffices to explain the extraordinary effects which his spoken words produced; hence, it is necessary to rely upon the testimony of contemporaries, and to accept their decision as conclusive. Pitt styled him a magician who laid a spell upon his hearers so long as words issued from his lips. A noble lord, thinking to curry favor with the premier, abused one of Fox's speeches, and received the generous reply from Pitt: "Don't disparage it; nobody could have made it but himself." Rogers has recorded that never did he "hear anything equal to Fox's *speeches in reply;* they were wonderful. Burke did not do himself justice as a speaker; his manner was hurried, and he always seemed to be in a passion. Pitt's voice sounded as if he had worsted in his mouth." Charles Butler said that Fox had a captivating earnestness of tone and manner; "the moment of his grandeur was when, after he had stated the argument of his adversary, with much greater strength than his adversary had done, and with much greater than his hearers thought possible, he seized it with the strength of a giant, and tore and trampled it to destruction." Sir James Mackintosh records that Fox "certainly possessed, above all moderns, that unison of reason, simplicity, and vehemence which formed the prince of orators." Burke pronounced him "the most brilliant and accomplished debater that the world ever saw." A man may be accomplished in statecraft and unrivalled in oratory, and yet may want the charm which renders him as worthy of love as of admiration. Few men whose statesmanship is indisputable, and whose pre-eminence as orators is acknowledged, have surpassed Fox in the graces which soften life and attract affection. His friends regarded him with idolatry. At the time of the French Revolution, when his party had become a fragment, Lord Thurlow said, "there are but forty of them, but there is not one of them who is not ready to be hanged for Fox." Lord Sidmouth, an uncompromising Tory, could not resist the fascination of his nature, and wrote, after knowing him personally, "I never knew a man of more apparent sincerity, more free from rancor, or even severity, and hardly any one so entirely devoid of affectation." Gibbon, another political opponent, admired in him "the powers of a superior man, as they are blended in his attractive character, with the softness and simplicity of a child. Perhaps no human being was ever more perfectly exempt from the taint of malevolence, vanity, or falsehood." It is unnecessary to supplement these testimonies with the eulogies of enthusiastic friends. Nor can there be any excess of partiality for him in the decision that Charles James Fox stands conspicuous among the English statesmen whose virtues ought to be kept in loving and perpetual remembrance. (W. F. R.)

FOX, GEORGE (1624–1690), the founder of the "Society of Friends" or "Quakers," was born at Drayton, Leicestershire, in July, 1624. His father, Christopher Fox, called by the neighbors "Righteous Christer," was a weaver by occupation; and his mother, Mary Lago, "an upright woman and accomplished above most of her degree," came of a family that had suffered much in former days of religious persecution. Both were members of the Church of England, and took great pains in the training of their children. George from his childhood "appeared of another frame than the rest of his brethren, being more religious, inward, still, solid, and observing beyond his years;" and he himself declares, "When I came to eleven years of age I knew pureness and righteousness; for while a child I was taught how to walk to be kept pure." Some of his relations wished that he should be educated for the church; but his father, after he had barely learned to read and write, lost no time in apprenticing him to a certain shoemaker, who also dealt in wool and cattle. In this service he remained till his nineteenth year, and acquired some proficiency in all the branches of his master's somewhat miscellaneous business; according to Penn, "He took most delight in sheep," but he himself simply says, "A good deal went through my hands. . . . People had generally a love to me for my innocency and honesty." In 1643, being upon business at a fair, and having accompanied some friends to the village public-house, he was deeply scandalized by a proposal to "drink healths," and abruptly withdrew in great grief of spirit. "When I had done what business I had to do, I returned home, but did not go to bed that night, nor could I sleep, but sometimes walked up and down, and sometimes prayed and cried to the Lord, who said unto me, 'Thou seest how young people go together into vanity and old people into the earth; thou must forsake all, both young and old, and keep out of all, and be a stranger unto all.' Then, at the command of God, on the ninth day of the seventh month, 1643, I left my relations and broke off all familiarity or fellowship with old or young." Thus briefly he describes what appears to have been the greatest moral crisis in his life. Of the four years which followed—the "times of the first workings of the Lord in him"—he has left but a confused account. They were on the whole years of great perplexity and distress, though sometimes "I had intermissions, and was sometimes brought into such a heavenly joy that I thought I had been in Abraham's bosom." He did not continue for many months to adhere to the letter of the command he believed himself to have received; he soon began to have some misgivings as to the propriety of his action in having forsaken his relations; and apparently without waiting for any new revelation, he ultimately conceded so much to the claims of natural affection as occasionally to visit those whom he had formerly thought it his duty to leave. Still, throughout this period his wanderings were very numerous, and covered a very wide area. He would go from town to town, "travelling up and down as a stranger in the earth, which way the Lord inclined my heart; taking a chamber to myself in the town where I came, and tarrying sometimes a month, more or less, in a place;" and the reason he gives for this migratory habit is that he was "afraid both of professor and profane, lest, being a tender young man, he should be hurt by conversing much with either." The same fear often led him to shun all society for days at a time; but frequently he would apply to "professors" for spiritual direction and consolation. These applications, however, never proved successful; he invariably found that his advisers "possessed not what they professed." Some recommended marriage, others enlistment as a soldier in the civil wars; one "ancient priest" bade him take tobacco and sing psalms; another of the same fraternity, "in high account," advised physic and blood-letting. About the beginning of 1646 his thoughts began to take more definite shape; or, as he himself expresses it, he began to receive more revelations. For example, as he was one day approaching the gate of Coventry, "the Lord opened to him" that none were true believers but such as were born of God and had passed from death unto life; and this was soon followed by other "openings" to the effect that "being bred at Oxford or Cambridge was not enough to fit and qualify men to be ministers of Christ," and that "God who made the world did not dwell in temples made with hands." "I had also great openings concerning the things written in the Revelations." He also experienced deeper manifestations of Christ within his own soul. "When I myself was in the deep, shut up under all [the burden of corruptions], I could not believe that I should ever overcome; my troubles, my sorrows, and my temptations were so great that I thought many times I should have despaired, I was so tempted. But when Christ opened to me how He was tempted by the same devil, and overcame him and bruised his head, and that through Him, and His power, light, grace, and spirit, I should overcome also, I had confidence in Him; so He it was that opened to me, when I was shut up and had no hope nor faith. Christ, who had enlightened me, gave me His light to believe in; He gave me hope which He Himself revealed in me: and He gave me His spirit and grace, which I found sufficient in the deeps and in weakness." With the knowledge he had thus received, Fox, towards the end of the year 1647, felt himself constrained to begin the work of his life as an itinerant preacher, the positive element in his teaching being to the effect that men ought to give sincere and earnest heed to the inner light—the light of Christ—which God had placed in every human heart. The scenes of his early labors and early successes were in the neighborhood of Dukinfield and Manchester, where he had "great openings and prophecies," and succeeded in establishing his influence over a considerable number of followers. From this date his creed grew rapidly in point of explicitness, especially on its negative and practical sides. For example, in 1648 it was revealed to him by the inner light that he was not to take off his hat to any person, high or low; that he was to use in addressing any single individual of whatever rank no other pronouns than the simple "thou" and "thee;" that he was not to bid people good morning or good evening; and that he was not to "bow or scrape with his leg to any one." Increasingly persuaded of the truth and importance of his message, he daily became bolder in the delivery of it. In the year 1649, as he was walking towards Nottingham on a first-day morning accompanied by some friends, he heard the bell of the "steeple house" of the city, and was admonished by an inward voice to go forward and cry against the great temple and the worshippers in it. Entering the church he found the preacher engaged in expounding the words, "We have also a more sure word of prophecy," from which the ordinary Protestant doctrine of the supreme authority of Scripture was being enforced in a manner which appeared to Fox so defective or erroneous as to call for his immediate and most energetic protest. Lifting up his voice against the preacher's doctrine, he declared that it is not by the Scripture alone, but by the divine light by which the Scriptures were given, that doctrines ought to be judged. The result of the disturbance which not unnaturally ensued was that he was seized by the constables and carried off to prison, where he was detained for some time, and from which he was released only by the favor of the sheriff, whose sympathies he had succeeded in enlisting. A similar adventure at Derby ended less favorably. For raising a discussion which seemed not unlikely to end in a breach of the peace in the church there, he was brought before the magistrates, and after examination, committed along with one of his comrades to the house of correction as a blasphemer;[1] and not till the beginning of 1651, after he had been a prisoner for almost a year, did he succeed in regaining his freedom. It would be here out of place to follow with any minuteness the details of his subsequent imprisonments, such as that at Carlisle in 1653, at London in 1654, at Launceston 1656, at Lancaster in 1660 and again in 1663, at Scarborough in 1666, and at Worcester in 1674. They are related with a certain monotony, which is yet far from being tedious or uninteresting, in the *Journal*, fortunately an easily accessible book. Suffice it to say that during these terms of imprisonment his pen was not idle, as is amply shown by the very numerous letters, pastorals, and exhortations which have been preserved by his followers; while during his intervals of liberty he was unwearied in the work of preaching and making disciples. While his labors were for the most part confined to the midland and northern counties of England, he found time in 1657 for a tour through Scotland, which, in his opinion, was not altogether without result. In 1669 he married the widow of a Welsh judge, Margaret Fell, who, with her family, had been among his earliest converts; but almost immediately afterwards his proselytizing ardor impelled him to proceed alone to Barbados, Jamaica, and the American continent. In all places visited by him there he met with a good reception, and was successful in making many converts. Shortly after his return in 1673 he was, as has been already noted, apprehended in Worcestershire for attending meetings that were forbidden by the law. He was ultimately set at liberty on account of errors in the indictment which had been drawn up against him, but this was not until after he had suffered a captivity of nearly fourteen months. In 1677 he visited Holland along with his followers Barclay and Penn; and this visit he renewed in 1684, extending his tour through a considerable part of North Germany. The later years of his life were spent mostly in London, where he continued to give public addresses, comparatively unmolested, until within a few days of his death, which took place November 13, 1690.

In personal appearance Fox was tall and strongly built, "graceful in countenance, manly in personage, grave in gesture;" in manner he was courteous and unaffected, "civil, beyond all forms of breeding," and "tender, compassionate, and pitiful;" essentially, he was "a heavenly-minded man, zealous for the name of the Lord, and preferred the honor of God before all things;" "a man that God endued with a clear and wonderful depth, a discerner of others' spirits, and very much a master of his own." These and similar characterizations by his friendly contemporaries, who, for the rest, do not pretend that he was in any way remarkable either for grasp of intellect or for profundity in learning, surely deserve some weight as against the somewhat prevalent opinion that Fox was nothing more than a vulgar charlatan whom we have "no reason for placing morally or intellectually above Ludowick Muggleton or Joanna Southcote" (Macaulay). The mere fact that he was able to attract to himself so considerable a body of respectable followers, including such men as Ellwood, Barclay, and Penn, is sufficient to prove that he possessed in a very eminent degree the power of conviction, persuasion, and moral ascendency; while of his personal uprightness, single-mindedness, and sincerity there ought to be no question.

The writings of Fox have been collected in three volumes folio,—the first containing his journal, the second his correspondence, and the third all that he has written in vindication of his doctrines. The *Journal* is especially interesting; of it Sir James Mackintosh has said that "it is one of the most extraordinary and instructive narratives in the world, which no reader of competent judgment can peruse without revering the virtue of the writer." Of other works attributed to him, perhaps the most curious is that originally published in London in 1660, entitled *A battle door for teachers and professors to learn singular and plural; you to many and thou to one; singular, one, thou; plural, many, you.* According to the *Journal*, however, this performance is not to be attributed solely to Fox. "J. Stubbs and Benjamin Furly took great pains in compiling it, which I set them upon, and some things I added to it." Indeed, it has sometimes been seriously doubted whether he was the real author of any of the publications which have been attributed to him; but this doubt, which proceeds merely upon the fact of his very imperfect literary education, seems to be conclusively settled by the clause in his will (which document may be seen in the *Harleian Miscellany*, vii. 599) referring to his "Bookes, Episeles, and Papers." The *Journal* was originally published in London in 1694, and has frequently been reprinted. A very useful edition is the seventh, with notes biographical and historical by Wilson Armistead, London, 1852. Several Memoirs of Fox have recently appeared,—one by J. Marsh in 1846; another by Janney, with dissertations on his views concerning the doctrine, testimonies, and discipline of the Christian church (Philadelphia, 1852); a third by the Rev. John Selby Watson (London, 1860). For details of the principles and history of the Society of Friends, see the article QUAKERS. (J. S. BL.)

FOX, RICHARD, an English prelate, statesman, and diplomatist, bishop successively of Exeter, Bath and Wells, Durham, and Winchester, and founder of Corpus Christi College, Oxford, was born about the close of the reign of Henry VI. He was a native of Ropesley, near Grantham, in Lincolnshire, and his parents are said to have been in humble circumstances. His education, however, was not neglected, for he was sent to school either at Boston or at Winchester, and thence transferred to Magdalen College, Oxford. His studies, in which he gained much distinction, were interrupted by an outbreak of the plague, and he went to continue them at Pembroke Hall, Cambridge. He next went to Paris, and there pursued the study of theology and the canon law. At Paris he became acquainted with Morton, bishop of Ely, then an exile, and by him he was introduced to Henry, earl of Richmond, who was preparing his invasion of England. He at once gained Henry's confidence, and managed for him the delicate business of getting assistance in men and money from the king of France. After the victory of Bosworth and accession of the earl as Henry VII., Fox, now a doctor of divinity, was made a privy councillor, and became one of the most trusted advisers of the king. Honors fell thick upon him. In rapid succession he was made a prebendary of Sarum, bishop of Exeter, keeper of the privy seal, principal secretary of state, and master of St. Cross, Winchester (1487). From this time he was almost constantly employed by the king in political affairs both at home and abroad. He was several times sent ambassador to Scotland, and several times to France. In 1491 he was translated to the see of Bath and Wells, and three years later to that of Durham. In 1497 he personally defended his castle of Norham when besieged by the Scots, until it was relieved by the earl of Surrey. The same year he negotiated a truce for seven years between England and Scotland. He also took part in the treaty for the marriage between James IV. of Scotland and Margaret, daughter of Henry VII. In 1500 he was chosen chancellor of the university of Cambridge, and held the office for two years. The same year he was translated to the see of Winchester, which he held till his death, a period of twenty-eight years. He was master of Pembroke Hall, Cambridge, from 1507 to 1519. During the reign of Henry VII. his influence was supreme in the state, no important affair being undertaken without consulting him. The king named Fox one of his executors, and especially recommended him to his son and successor Henry VIII. But his credit soon declined under the new king, partly owing to the character of Henry, and partly to the rivalry of the earl of Surrey. Amongst the chaplains of Bishop Fox at this time was Thomas Wolsey; and in order to counteract the influence of Surrey, Fox introduced Wolsey to the king. In a little while the new comer took precedence of both the rivals. Fox, however, did not suddenly lose the royal favor. In March, 1510, he was sent ambassador to France with Surrey and the bishop of Durham, and signed the treaty of alliance with Louis XII. In 1513 he attended Henry VIII. in his expedition to France, and was present at the taking of Terouenne. The same year he took part in negotiating a treaty with the emperor Maximilian. Fox was one of the executors of Margaret, countess of Richmond, and in this capacity had a share in completing the settlement of St. John's College, Cambridge. Continually mortified by the supremacy of his former protegé, Wolsey, and by the insults he had to endure from him, he at length (1515) withdrew from the court and retired to his diocese. The rest of his life was devoted to the discharge of his ecclesiastical duties and to works of charity and munificence. During this period he rendered great service to the cause of liberal education by his foundation of Corpus Christi College, Oxford. His first intention was to make it a monkish seminary, and for this he obtained a license. But on the advice of Oldham, bishop of Exeter, he changed his plan, and made it simply a school for the increase of learning. Bishop Oldham contributed largely to the cost of the buildings. Fox was founder also of free schools at Taunton and at Grantham. He became blind some years before his death, and was pressed by Wolsey to resign his see to him, but this he stoutly refused to do. He died, in a good old age, September 14, 1528.

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[1] It was about this time that the epithet "Quaker" was first bestowed upon Fox and his friends (by Justice Bennett of Derby, it is said) because "they bade the people tremble at the word of the Lord." It soon passed into common use, and is to be found even in the Records of the House of Commons as early as 1654.

FOXE, John (1517–1587), was born at Boston in Lincolnshire in 1517. At the age of sixteen he entered Brasenose College, Oxford, where at twenty-one he took the degree of B.A., and five years later that of M.A. He attained a fair reputation for scholarship, was elected to a fellowship at Magdalen, and wrote several Latin plays on Scriptural subjects, of which the best, the *De Christo Triumphante*, was repeatedly published (London, 1551, Basel, 1556, etc.), and was thought worthy of translation into English by Richard Day, the son of the printer. Having become deeply interested in the more advanced religious inquiry of his time, he devoted himself to the study of Hebrew, of the ancient fathers, and of the doctrines of the Reformers; and at length his views coming to the ears of the authorities were considered so unorthodox that in 1545 he was deprived of his fellowship and expelled from the university. Here his punishment would probably have ended had not his stepfather taken advantage of his misfortune to deprive him of his patrimony. He was glad to accept a situation as tutor to the children of Sir Thomas Lucy, of Charlecote, near Stratford-on-Avon, who is famous as the prototype of Shakespeare's "Justice Shallow." But he did not long retain this situation, and he was in London in very destitute circumstances, when the duchess of Richmond appointed him tutor to the children of her nephew, the unfortunate earl of Surrey. During the reign of Edward, Foxe's circumstances were more comfortable. He married, and settled at Reigate, where, having been ordained deacon by Ridley in 1550, he preached and acted as tutor to the orphan children of Surrey throughout the rest of the reign On the accession of Mary, he was for some time protected by his pupil, the duke of Norfolk, but was at length obliged to seek safety by fleeing with his family to Basel, where he maintained himself by writing and correcting the press for the printer Oporinus. At the suggestion of Lady Jane Grey, he had already commenced a Latin history of the Christian persecutions. He now received assistance from two distinguished exiles, belonging to opposed sections of the Protestant party—from Grindal, who afterwards as Puritan archbishop of Canterbury distinguished himself by the noble firmness with which he maintained his convictions, even at great personal cost, and in opposition to the commands of Queen Elizabeth; and from John Aylmer, the tutor of Lady Jane Grey, who afterwards, as bishop of London, was one of the bitterest enemies of the Puritans. The first outline of the work appeared in 1554, and the first complete edition was published by Oporinus in 1559. About a year after the accession of Elizabeth, Foxe returned to England. The duke of Norfolk again extended to him his patronage. For some time he resided at the duke's manor of Christchurch in London, and on the duke's death he received a small pension. He became associated with John Day, the printer, himself once a Protestant exile, with whom he had many sympathies in common. We find him staying in Grub Street laboriously engaged in varied literary work, and occasionally preaching at St. Paul's Cross and in other parts of London. Church preferment was offered him by the Government, to which his works had rendered invaluable service. Cecil appointed him to the prebend of Shipton in Salisbury Cathedral, and he held for a short time the living of Cripplegate; but true to his Puritan views, which prevented him from subscribing to the Articles, he accepted nothing further, though more was offered him. In 1563 the first English edition of the "Book of Martyrs," in which several gross errors which had been exposed were corrected, appeared from the press of John Day.[1] Its popularity among a people which had just passed through the horrors of the Marian persecutions was naturally immediate and signal. The Government commanded it to be placed in each parish church; and more than any other influence it fanned the flame of that fierce hatred of Spain and the Inquisition which was the master passion of the reign. Nor was its influence transient. For generations the popular conception of popery has been derived from its melancholy and bitter pages. It was vigorously attacked by Catholic writers, and its accuracy in details has been successfully challenged, even such blunders as indicate gross over-credulity having been exposed; but the honorable lives of Foxe and his assistants place the work above the charge of wilful falsehood. If in all those who had been engaged in the persecution he could only recognize the spirit of cruelty and Antichrist—if in the noble Sir Thomas More he could only see "a persecuting spirit,"—this was but natural in a man who had witnessed the untimely destruction of some of the noblest spirits of the age, of some whom he had personally known and loved, and whose own career has been undeservedly blighted by the ruthless hand of persecution; and it must be remembered to his honor that in his firm grasp of the principle of religious toleration he rose far above his age and his fellow Protestants. He hated impartially *all* religious persecution, and he wrote to Queen Elizabeth pleading even for the despised Dutch Anabaptists. It is interesting to note that Foxe was one of the earliest students of Anglo-Saxon, and that John Day was the only printer of the day who could print the Anglo-Saxon characters. In 1571 they published, under the patronage of Archbishop Parker, an edition of the Saxon Gospels, dedicated to the queen. Foxe died on the 18th April, 1587, at the age of seventy, and was buried in the Church of St. Giles, Cripplegate. His life was written by his son, Samuel Foxe.

FOXGLOVE. See Digitalis.

FOY, Maximilien Sébastien (1775–1825), French general and political orator, was born at Ham, in Picardy, February 3, 1775. He was the son of an old soldier who had fought at Fontenoy, and had become post-master of the town in which he lived. His father died in 1780, and his early instruction was given by his mother, a woman of English origin and of superior ability. He continued his education at the college of Soissons, and thence passed at the age of fourteen to the artillery school of La Fère. After eighteen months' successful study he entered the army, served his first campaign in Flanders (1791), and was present at the battle of Jemmapes. He soon attained the rank of captain, and served successively under Dampierre, Jourdan, Pichegru, and Houssard. In 1794, in consequence of having spoken freely against the violence of the extreme party at Paris, he was imprisoned by order of the commissioner of the Convention, Joseph Lebon, at Cambray, but regained his liberty soon after the fall of Robespierre. He served under Moreau in the campaigns of 1796 and 1797, distinguishing himself in many engagements. The leisure which the treaty of Campo Formio gave him he devoted to the study of public law and modern history, attending the lectures of Professor Koch at Strasburg. Recommended by Desaix to the notice of General Bonaparte, he joined the army assembled for the invasion of England, and afterwards fought, with much regret, against the Swiss. He gained the confidence of Masséna, and was promoted *chef de brigade*. After the peace of Amiens he returned to France with the rank of colonel. He was at Paris at the time of Moreau's trial, and having earnestly censured the proceedings escaped arrest only by joining the army in Holland. Foy voted against the establishment of the empire, but the only penalty for his independence was a long delay before attaining the rank of general. In 1806 he married a daughter of General Baraguay d'Hilliers. In the following year he was sent to Constantinople, and there took part in the defence of the Dardanelles against the English fleet. He was next sent to Portugal, and served in the Peninsular War from the battle of Vimeira to the battle of Orthez, at which he was severely wounded. At the first restoration of the Bourbons he was made one of the inspectors-general of infantry, and was stationed at Nantes. He joined Napoleon I. on his escape from Elba, and fought with distinction at Quatre-Bras and at Waterloo, where he was again badly wounded. After the second restoration he returned to civil life, and in 1819 was elected to the chamber of deputies. For this position his experience and his studies had especially fitted him, and by his first speech he gained a commanding place in the chamber, which he never lost, his clear, manly eloquence being always employed on the side of freedom and justice. In 1823 he made a powerful protest against French intervention in Spain, and after the dissolution of 1824 he was re-elected for three constituencies. He died at Paris, November 28, 1825, and his funeral was celebrated amidst the mourning of the city and the nation. His family were provided for by a national subscription.

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[1] The following is the full title:—*Acts and Monuments of these latter and Perillous Dayes, touching matters of the Church, wherein are comprehended and described the great Persecutions and horrible Troubles that have been wrought and practised by the Romishe Prelates, especiallye in this Realme of England and Scotland, from the yeare of our Lorde a thousande to the time now present. Gathered and collected according to the true Copies and Wrytinges certificatorie as well of the Parties themselves that Suffered, as also out of the Bishops' Registers, which were the Doers thereof, by John Foxe.*

A collection of his speeches was published in 1826, and his unfinished *Histoire de la Guerre de la Péninsule sous Napoléon* in 1827. Several biographies of Foy have been published.

FRAAS, KARL NIKOLAS (1810–1875), a German botanist and agriculturist, was born at Stettelsdorf, near Bamberg, 8th September, 1810. After receiving his preliminary education at the gymnasium of Bamberg, he in 1830 entered the university of Munich, where he took his doctor's degree in 1834. Having devoted great attention to the study of botany, he went to Athens in 1835 as inspector of the court garden; and in April, 1836, he became professor of botany at the university. In 1842 he returned to Germany, and became teacher at the central agricultural school at Schleissheim. In 1847 he was appointed professor of agriculture at Munich, and in 1851 director of the central veterinary college. For many years he was secretary of the Agricultural Society of Bavaria, but resigned in 1861. He died at his estate of Neufreimann near Munich, 9th November, 1875. Besides his important contributions to the sciences of botany and agriculture, Fraas devoted much of his effort to improve the condition of the peasants.

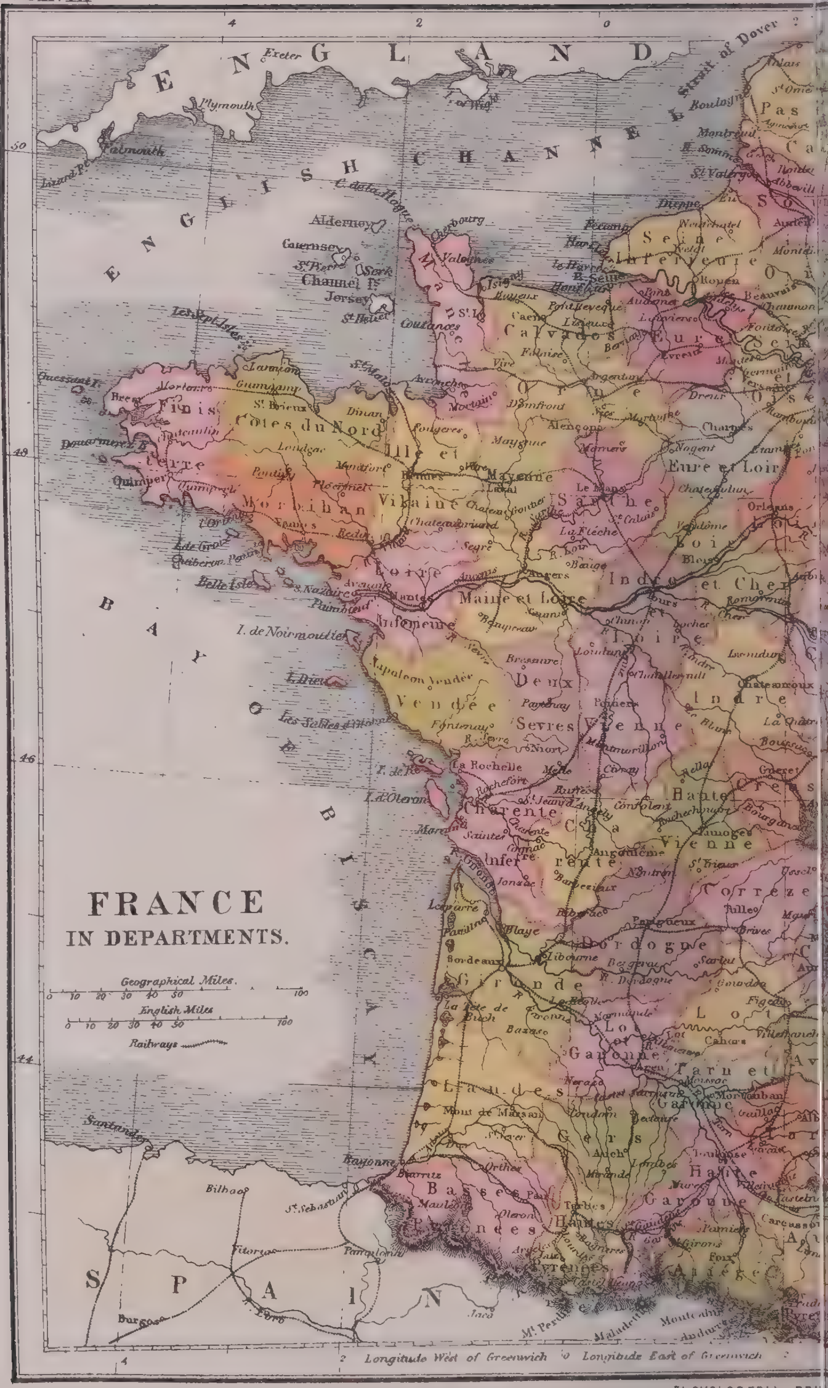
His principal works are—Στοιχεῖα της Βοτανικῆς, Athens, 1835; *Synopsis floræ classicæ*, Munich, 1845; *Klima und Pflanzenwelt in der Zeit*, Landsh., 1847; *Histor-encyklopäd. Grundriss. der Landwirthschaftslehre*, Stuttgart, 1848: *Geschichte der Landwirthschaft*, Prague, 1851; *Die Schule des Landbaues*, Munich, 1852; *Baierns Rinderrassen*, Munich, 1853; *Die Künstliche Fischerzeugung*, Munich, 1854; *Die Natur der Landwirthschaft*, Munich, 1857: *Buch der Natur für Landwirthe*, Munich, 1860; *Die Ackerbaukrisen und ihre Heilmittel*, Munich, 1866; *Das Wurzelleben der Culturpflanzen*, Berlin, 1872; and *Geschichte der Landbau und Forstwissenschaft seit dem 16ten Jahr.*, Munich, 1865. He also founded and edited a weekly agricultural paper, the *Schranne*.

FRA BARTOLOMMEO. See BACCIO DE LA PORTA.

FRACASTORIO, HIERONYMO (1483–1553), a learned physician and poet, was born at Verona in 1483. It is related of him that at his birth his lips adhered so closely that a surgeon was obliged to divide them with his incision knife, and that during his infancy his mother was killed by lightning, while he, though in her arms at the moment, escaped unhurt. Fracastorio became eminently skilled, not only in medicine and belles-lettres, but in most arts and sciences. It was by his advice that Pope Paul III., on account of the prevalence of a contagious distemper, removed the council of Trent to Bologna. He was the author of many works, both poetical and medical, and was intimately acquainted with Cardinal Bembo, Julius Scaliger, and most of the great men of his time. He died of apoplexy at Casi, near Verona, on the 8th of August, 1553; and in 1559 the town of Verona erected a statue in his honor.

The principal work of Fracastorio is a kind of medical poem entitled *Syphilidis, sive Morbi Gallici, libri tres*, Verona, 1530, which has been often reprinted, and also translated into French and Italian. Among his other works (all published at Venice) are *De Vini Temperatura*, 1534; *Homocentricorum*, 1535; *De Sympatha et Antipathia Rerum*, 1546; and *De Contagionibus*, 1546. His complete works were published at Venice in 1555, and his poetical productions were collected and printed at Padua in 1728.

FRA DIAVOLO is the popular name given by his countrymen to the most notorious and dreaded of modern Italian brigands; and the name, associated during his lifetime with the political revolutions of southern Italy, has acquired a world-wide celebrity since it became the title of a favorite French opera. His real name was Michele Pezza. It would be as hopeless to fix the precise dates in his career as to determine those in the lives of Rob Roy or Jonathan Wild. He is stated, however, to have been born at Itri. His crimes became invested with a more general and political interest in 1799. At that time, from the frequency and audacity of his robberies and murders along the frontier of the Terra di Lavoro, he became known as Fra Diavolo, the popular superstition investing him with the blended attributes of a monk and a demon. When the kingdom of Naples was overrun by the troops of the French Republic, Fra Diavolo, acting in concert with the head of the Bourbon partisans, Cardinal Ruffo, waged a fierce and untiring war against the French soldiers, whenever his superior knowledge of the localities afforded the prospect of his being able to do so with effect. He continued for a considerable period in absolute possession of the line of communication from the Garigliano to Portello, falling upon and massacring the French Government couriers, and all whom he suspected of conveying information to the military or civil functionaries of the Republic. At one moment he succeeded in completely interrupting all communication between Naples and Rome. Like his fellow agents under Cardinal Ruffo—like Mammone, Pronio, Sciarpa Guarriglia—he styled himself "the faithful servant and subject of his Sicilian Majesty." As the turning point in Fra Diavolo's career must be regarded the arrival in Naples of Joseph Bonaparte, and the establishment of the extraordinary tribunals charged with the repression of this half civil, half political brigandage. Fra Diavolo was sentenced to death, and a price was set on his head. After spreading terror through Calabria by his deeds of cruelty he had passed over into Sicily, but soon returned to the mainland at the head of 300 liberated convicts placed at his disposal by the Bourbon Government. His landing at Spelonza with these ruffians was marked by unusual excesses, but the French troops were everywhere on the alert to capture him, and he was compelled to seek refuge amongst the woods and mountains of Lenola. During a period of two months he succeeded in evading his pursuers, always in the hope of making his way back to Sicily. At length, exhausted by hunger and requiring medical aid, he repaired in disguise to the village of Baronissi, but was there recognized and put to death. It is stated that on his person were found papers from Queen Caroline of Naples and Admiral Sidney Smith, those from the former recognizing his rank as colonel in the Bourbon army, and that in his last moments he cursed both his employers and his own folly which had led him to engage in such a reckless



FRANCE
IN DEPARTMENTS.

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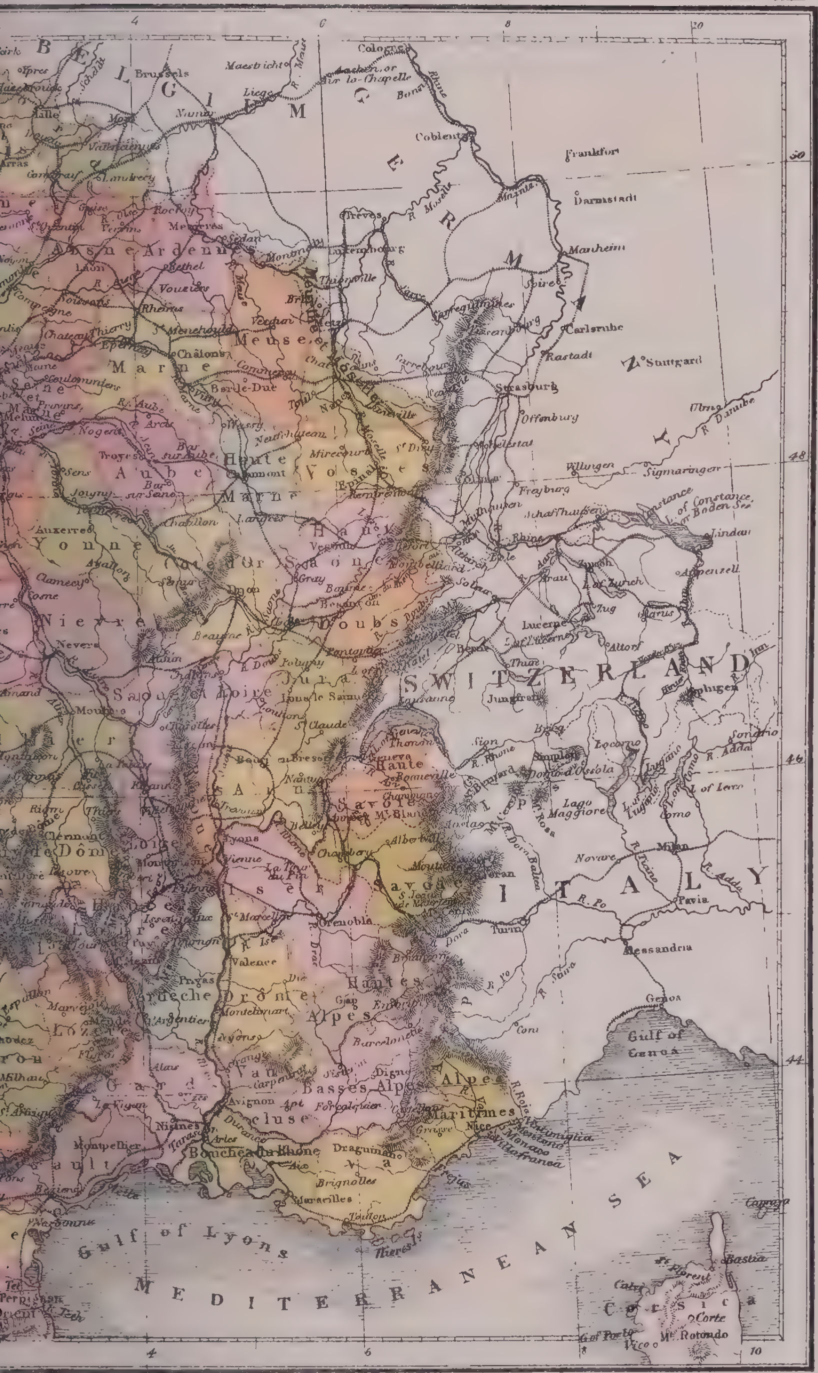
B E L G I U M
G E R M A N Y
S W I T Z E R L A N D
I T A L Y
M E D I T E R R A N E A N   S E A
Gulf of Lyons
Gulf of Genoa
Corsica
Brussels
Maestricht
Liege
Namur
Mons
Lille
Valenciennes
Arras
Cambrai
Cologne
Aachen or Aix la-Chapelle
Bonn
Coblentz
Frankfort
Darmstadt
Mainz
Manheim
Spire
Carlsruhe
Rastadt
Stuttgard
Treves
Luxembourg
Sedan
Mezieres
Rocroy
Aisne
Ardennes
Laon
Rethel
Vouziers
Rheims
Soissons
Compiegne
Chateau Thierry
Epernay
Châlons
Marne
Ste Menehould
Meuse
Verdun
Metz
Thionville
Briey
Saargemund
Strasburg
Offenburg
Commercy
Bar-le-Duc
Toul
Nancy
Lunéville
Meurthe et Moselle
Seine et Marne
Melun
Provins
Coulommiers
Arcis
Nogent
Troyes
Aube
Bar sur Aube
Bar sur Seine
Sens
Joigny
Haute Marne
Chaumont
Langres
Wassy
Neufchâteau
Mirecourt
Epinal
Vosges
Remiremont
St Dié
Colmar
Schlestadt
Mulhausen
Basle
Freyburg
Villingen
Sigmaringen
Ulm
R. Danube
Schaffhausen
L. of Constance or Boden See
Lindau
Appenzell
Rhine
Zurich
Aarau
Zug
Glarus
Lucerne
Altorf
Bern
Thun
Jungfrau
Splugen
Sondrio
R. Adda
Lugano
Como
L. of Lecco
Locarno
Lago Maggiore
Domo d'Ossola
Simplon
Brieg
Sion
R. Rhone
M. Rosa
Aosta
Novara
Milan
Pavia
R. Ticino
R. Po
Turin
Alessandria
Genoa
Coni
Yonne
Auxerre
Avallon
Clamecy
Cosne
Nievre
Nevers
Côte d'Or
Dijon
Beaune
Chatillon
Haute Saône
Vesoul
Gray
Belfort
Montbelliard
Doubs
Besançon
Baume
Pontarlier
Solothurn
Neufchatel
Lausanne
Geneva
Thonon
Bonneville
Chamounix
M. Blanc
Haute Savoie
Annecy
Savoie
Chambery
Albertville
Moutiers
S. Jean de Maurienne
Jura
Lons le Saunier
Poligny
Dôle
St Claude
Saône et Loire
Chalon
Autun
Macon
Charolles
Louhans
Ain
Bourg
Nantua
Belley
Trevoux
Lyons
Vienne
La Tour du Pin
Isère
Grenoble
St Marcellin
Valence
Drôme
Die
Nyons
Montelimart
Privas
Ardeche
L'Argentière
Hautes Alpes
Gap
Embrun
Briançon
Basses Alpes
Digne
Barcelonette
Sisteron
Forcalquier
Castellane
Vaucluse
Avignon
Apt
Carpentras
Orange
Alpes Maritimes
Nice
Grasse
Mentone
Monaco
Villafranca
Ventimiglia
R. Roja
Var
Draguignan
Brignolles
Toulon
Marseilles
Aix
Bouches du Rhône
Arles
Tarascon
Nîmes
Gard
Alais
Le Vigan
Montpellier
Hérault
Beziers
Cette
Narbonne
Perpignan
Lozère
Mende
Florac
Millau
Rodez
Puy de Dôme
Clermont
Riom
Thiers
Loire
Montbrison
Roanne
St Etienne
Moulins
Allier
Hières
Frejus
Bastia
Corte
Ajaccio
Calvi
M. Rotondo
Capraja
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enterprise. The most authentic source for the career of Fra Diavolo is Colletta's *History of Naples*, which the English reader may consult in the version, equally faithful and spirited, of Miss Horner.

FRÄHN, CHRISTIAN MARTIN, a numismatist and historian, was born at Rostock, 4th June, 1782, and died at St. Petersburg, 28th August, 1851. He commenced his Oriental studies under Tychsen at the university of Rostock, and afterwards prosecuted them at Göttingen and Tübingen. He became a Latin master in Pestalozzi's famous institute in 1804, returned home in 1806, and in the following year was chosen to the chair of Oriental languages in the Russian University of Kasan. Though in 1815 he was invited to succeed Tychsen at Rostock, he preferred to go to St. Petersburg, where he became director of the Asiatic museum and councillor of state. The indefatigable ardor with which he pursued his studies is shown by the number of his works, which altogether amount to more than 150, great and small.

Among the more important are—*Numophylacium orientale Pototianum*, 1813; *De numorum Bulgharicorum fonte antiquissimo*, 1816; *Das Muhammedanische Münzkabinet des Asiatischen Museum der Kaiserl. Akademie der Wissenschaften zu St. Petersburg*, 1821; *Numi cufici ex variis museis selecti*, 1823; *Notice d'une centaine d'ouvrages arabes, etc., qui manquent en grande partie aux bibliothèques de l'Europe*, 1834; and *Nova Supplementa ad recensionem Num. Muham. Acad. Imp. Sci. Petropolitanæ*, 1855 (posthumous). A description of some medals struck by the Samanid and Bouid princes (Kasan, 1804) deserves special mention, as the author composed it in Arabic because he had no Latin types at command.

FRAMLINGHAM, a market town of England in the county of Suffolk, about 4 miles north-east of Ipswich. It is the terminus of a branch railway, and has a corn exchange, a people's hall, and a newspaper office. The church is a fine old building mostly in the Perpendicular style, constructed of black flint stone, and surmounted by a tower 96 feet high. In the interior there are a number of interesting monuments, among which the most noticeable are those of Thomas Howard, third duke of Norfolk, and of Henry Howard, the famous earl of Surrey who was beheaded by Henry VIII. The castle forms a picturesque ruin, consisting of the outer walls 44 feet high and 8 feet thick, 13 towers about 58 feet high, a gateway, and some outworks. About half a mile from the town is the Albert Memorial Middle Class College, opened in 1865, and capable of accommodating 300 boys. A bronze statue of the Prince Consort by Durham adorns the front terrace. The population of the parish in 1871 was 2569. Framlingham dates, according to tradition, from the time of Redwald, king of the East Angles, but its history is of doubtful authenticity till the Norman period. The castle was successively held by the Bigods, the Mowbrays, and the Howards. On the attainder of Thomas Howard, it was seized by the king, and it thus became for a time the residence of Queen Mary of England. Though restored to the Howard family by James I., it was suffered to fall into decay, and in 1635 it was sold, along with the park and the advowson of the living, to Sir Robert Hitcham, who left the whole to the use of the masters and fellows of Pembroke Hall, Cambridge. (See *Trans. of Brit. Archæolog. Assoc.*,1865.)

FRANÇAIS, ANTOINE, Count, better known as Français of Nantes, a French politician and author, was born at Beaurepaire in the department of Isère on January 17, 1756, and died at Paris, 7th March, 1836. In 1791 he was elected to the Legislative Assembly by the department of Loire Inférieure, and soon attained a high position among his fellow representatives; but he was not re-elected to the Convention. During the Reign of Terror he was obliged to seek safety in the mountains. In 1798 he was elected to the council of the Five Hundred, and became one of its secretaries; and in the following year he voted against the Directory. He took office under the consulate as prefect of Charente Inférieure, rose to be a member of the council of state, and in 1804 obtained the important post of director-general of taxes. The value of his services was recognized by the titles of count of the empire and grand officer of the Legion of Honor. On the second restoration he retired into private life; but from 1819 to 1822 he was representative of the department of Isère, and after the July revolution he was made a peer of France.

Français wrote a number of works, but his name is more likely to be preserved by the eulogies of the literary men to whom he afforded protection and assistance. It is sufficient to mention *Le Manuscrit de feu M. Jérôme*, 1825; *Recueil de fadaises composé sur la montagne à l'usage des habitants de la plaine*, 1826; *Voyage dans la vallée des originaux*, 1828; *Tableau de la vie rurale, ou l'agriculture enseignée d'une manière dramatique*, 1829.

FRANCAVILLA, a town of Italy, in the province of Lecce, about 21 miles W.S.W. of Brindisi, sometimes called Francavilla Fontana, to distinguish it from Francavilla in Sicily and other towns of the same name. It stands in a very beautiful situation, and is regularly built, with wide streets and handsome if somewhat heavy-looking houses. There are a cathedral, a college, and several hospitals and conventual buildings. The town was founded in the 15th century and owes its name to the freedom from taxation which was granted for ten years to all who made it their place of residence. In 1734 it suffered considerably from an earthquake. The population of the town in 1871 was 16,997, and that of the commune 19,052.

Plates XII. and XIII.

Position and extent.

FRANCE. PART I.—GEOGRAPHY AND STATISTICS.—I. *Situation and Extent.—Face of the Country.—Climate and Soil.* This important part of continental Europe extends from the 43d to the 51st degree of north latitude, and from longitude 7° 35′ E. to longitude 4° 43′ W. The boundaries of France are—on the N. the English Channel (*Manche*), the Straits of Dover (*Pas-de-Calais*), Belgium, and Luxembourg; on the E. Germany (Alsace-Lorraine), Switzerland, and Italy; on the S. the Mediterranean and Spain; on the W. the Atlantic Ocean. From north to south its length is about 576 miles, measured from Dunkirk to the Col de Falguères; its breadth from east to west is about 494 miles, from Mont Donon to Cape Saint-Mathieu at the extremity of Brittany, which projects into the Atlantic like a wedge, and without which France would approach in form to a square; and its superficial extent, including Corsica and the small islands on the coasts, is 204,147 English square miles, nearly twice the total area of the British Isles.

Coast-line.

Though in point of extent of coast and ready access from the interior to the sea France is far inferior to Great Britain and Ireland, it is, on the other hand, more fortunate in these respects than the vast inland territories of Austria and Russia,—its coast-line extending 395 miles on the Mediterranean, 572 on the North Sea, the Straits of Dover, and the Channel, and 584 on the Atlantic. The country has the advantage likewise of being separated from its neighbors by natural barriers of great strength, the Pyrenees forming a powerful bulwark on the south-west, the Alps on the south-east, and the Jura and the Vosges mountains on the east. The boundary line on the side of Belgium is the only one which nature has left unprotected.

Mountains.

Orography.—The line which separates the basins of the Mediterranean and the Atlantic runs to the north from the Pyrenees through the Cevennes and Vosges, and finally joins the Alps in the south-east. The most remarkable summits in the Pyrenees are the Pic du Midi d'Ossau (9734 feet), not far from the favorite town of Pau, the Pic d'Anie (8219 feet), the cirque of Gavarnie, Mont Néthou (11,168 feet), Mont Perdu (10,995 feet), the Pic Long (10,476 feet), the Vignemale (10,820 feet), the Tour de Marboré (9861 feet). An offshoot of the Pyrenees, the Corbières, deserves mention, on account of the huge granitic mass that it contains, called the Canigou. The Cevennes are about 600 kilometres (373 miles) in length, lying between the Rhone on the east and the Garonne and Loire on the west; here, proceeding from south to north, we have Mont Naurouze, the Pic of Montaut (3412 feet), the Malpertus (5512 feet), the Hort de Dieu (5135 feet), Mont Pila (4474 feet, Vivarais), Gerbier des Joncs (5121 feet), Mézenc (5820 feet), Tarare (4757 feet), Haute-Joux (3262 feet, Charolais). Smaller chains detach themselves from the Cevennes, among which may be noticed the Montagnes d'Auvergne, the Plomb du Cantal (6095 feet), the Puy-de-Saucy (6220 feet), the Puy-de-Dôme (4806 feet), the Mount Dore (6187 feet), the mountains of Limousin, and those of Velez, Forez, and Madeleine. The Vosges, which reach no great height, trend northward between the Rhine and the Moselle. Their ramifications are the hills of Belfort, the Faucilles mountains, the Langres plateau, the Montagnes de la Côte d'Or, which are continued by the mountains of Morvan, the Orleans plateau, and the hills of Picardy, Normandy, and Brittany. The Vosges end in the north with the Argonne and the Ardennes, which separate the Seine from the Meuse. The Jura is a chain of the Alps extending between the Rhine and the Rhone from the north-east to south-west. Its principal summits are the Crêt de la Neige (5656 feet), the Reculet (5630 feet), Mont Tendre (5518 feet), and the Dôle (5514 feet). Mont Blanc (15,780 feet), the highest mountain in Europe, is in the Alps of Savoy, which project the Graian Alps, the mountains of Maurienne (Mont Cenis), the Cottian Alps, the Maritime Alps, the Alps of Dauphiné, and the Alps of Provence. As may be seen from these particulars, the surface of France exhibits, in general, an advantageous succession of high and low ground. Less level than Poland, the north of Germany, or the greater part of European Russia, it is, on the whole, less mountainous than Spain or Italy, and may with great propriety be compared to England, with this distinction that, whilst in the latter the mountainous tracts are in the north and west, in France they are in the south and east. Throughout Flanders, Picardy, Normandy, and the countries to the north and south of the Loire, we find plains, diversified occasionally by hills (either insulated or rising in succession), but having none of those massy elevations entitled to the name of mountains. The south and east of France, on the contrary, are rugged and elevated tracts, and may be said to be to that country what Wales and Scotland are to Great Britain.

Rivers.

Hydrography.—The course of the great rivers is easily connected with this view of the surface of the territory of France. With the exception of the Rhone, they all flow either from south to north or from east to west, and discharge themselves into the North Sea, the Channel, and the Atlantic. The Rhine, which not long ago formed the boundary between France and Germany, has part of its basin in France; the Moselle, one of its affluents, takes its source in the Vosges (Ballon d'Alsace), and waters Remiremont, Épinal, Toul, and Pont-à-Mousson, before entering the German territory; the Valogne, the Meurthe, and the Seille are its tributaries. The Meuse rises not far from Bourbonne-les-Bains, and becomes a Belgian river at Givet. During its course it receives on its right bank the Chiers and the Semoy, and on its left the Bar and the Sambre. The Escaut (or Scheldt) has its source near Le Catelet (Aisne), and leaves France after having watered Cambrai, Valenciennes, and Condé; the upper courses of its two affluents, the Scarpe and the Lys, also belong to France. The Somme, which receives the Avre, rises near St. Quentin, and empties itself into the Channel between St. Valery and Le Crotoy. The Seine, one of the four large rivers of France, the others being the Loire, the Garonne (Gironde), and the Rhone, descends from the Langres plateau, flows north-west down to Méry, turns to the west, resumes its north-westerly direction at Montereau, passes through Paris, and discharges itself into the Channel between Le Havre and Honfleur above Rouen and Quillebœuf. Its affluents are, on the right, the Aube, the Marne (which joins the Seine at Charenton near Paris, after having received the Ourcq and the Saulx), the Oise (which has its source in Belgium and is enlarged by the Aisne), and the Epte; on the left the Yonne, the Loing, the Essonne, the Eure, and the Rille. The Orne is a short river, which waters Argentan and Caen (Normandy), and flows into the Channel, the Vilaine, not much more considerable, passes Rennes, Redon, and La Roche-Bernard (Brittany), near which it falls into the Atlantic. The Loire rises in Mont Gerbier des Joncs, in the range of the Vivarais mountains, flows due north to Nevers, then turns to the north-west as far as Orléans, where it takes its course towards the south-west, and lastly from Saumur runs west, till it reaches the Atlantic between Paimbœuf and St. Nazaire. It passes through several large towns, as Nevers, Orléans, Tours, Angers, and Nantes. On the right the Loire receives the waters of the Furens, the Aroux, the Nièvre, the Maine (formed by the Mayenne and the Sarthe with its affluent the Loir), and the Erdre, which joins the Loire at Nantes; on the left, the Allier (which receives the Dore and the Sioule), the Loiret, the Cher, the Indre, the Vienne with its affluent, the Creuse, the Thouet, and the Sèvre-Nantaise. The Loire, the longest of French rivers, is navigable for about 512 miles of its course. It is often in many places dried up during the hot season of the year, while, on the other hand, it is subject to frequent and disastrous floods at the time when the snows melt in the upper valleys, or as a consequence of the long rains of autumn. The Charente descends from Chérounac (Haute-Vienne), traverses Angoulême, and falls into the Atlantic not far from Rochefort. The Garonne rises in the valley of Aran (Spanish Pyrenees), enters France near Bagnères-de-Luchon, has first a north-west course, then bends to the north-east, and soon resumes its first direction. It flows through Toulouse, Agen, and Bordeaux, and joins the Atlantic between Royan and the Point de Grave, opposite the tower of Cordouan. In the lower part of its course from the Bec-d'Ambez, where it receives the Dordogne, it becomes considerably wider, and takes the name of Gironde. The principal affluents are the Ariége, the Tarn with the Aveyron and the Agout, the Lot, and the Dordogne, which descends from the Mont Dore-les-Bains, and joins the Garonne at Bec-d'Ambez, to form the Gironde. All these affluents are on the right; the Gers is the only one of note which joins it on the left. The Adour rises near the Pic-du-Midi in the Pyrenees, and discharges itself into the Bay of Biscay at Bayonne; the mass of its waters is much increased in winter by several mountain streams, of which the Gave de Pau, the Bidouze, and the Nive may be mentioned. The Hérault is the first river of France which runs south and discharges itself into the Mediterranean. It comes from the Mont Laigonat in the Cevennes, and debouches into the Gulf of Lyons. The Rhone, the source of which is in Mont St. Gotthard, in Switzerland, enters France by the narrow defile of L'Écluse, and has a somewhat meandering course, first flowing south, then north-west, and then west as far as Lyons, whence it runs straight south till it reaches the Mediterranean, into which it discharges itself by two principal branches, which form the delta or island of the Camargue. Lyons, Vienne, Valence, Avignon, Beaucaire, Arles, are the chief towns passed by the impetuous waters of the Rhone. The Ain, the Saône (which passes through Mâcon, receives the Doubs, and joins the Rhone at Lyons), the Ardèche, and the Gard are the affluents on the right; on the left we may mention the Arve, the Isère, the Drôme, and the Durance. The Var, a large and rapid stream, descends from Mont Caméléon (Alpes Maritimes), and flows into the Mediterranean near Saint-Laurent-du-Var.

Lakes.

Lakes.—France has very few lakes. The Lake of Geneva, which forms 32 miles of the frontier, belongs to Switzerland. The most important French lake is that of Grand-Lieu, between Nantes and Paimbœuf (Loire-Inférieure), which presents a surface of 17,300 acres. We may also mention the lakes of Bourget and Annecy (both in Savoy), St. Point (Jura), Paladru (Isère), and Nantua (Ain). The lakes, or *étangs*, of Villers (Cher), Indre, Stock, Condrexange (Meurthe), Horre (Aube), Chaussée (Meuse), Ploërmel (Morbihan), La Pelaque (Maine-et-Loire), are artificial creations. The coasts present a number of maritime inlets, forming inland bays, which communicate with the sea by channels of greater or less width. Some of these are on the south-west coast, in Gascony, as Carcans, Lacanau, Biscarosse, Cazan, Sanguinet; but more are to be found in the south and south-east, in Languedoc and Provence, as Leucate, Sigean, Thau, Maguelonne, Berre, Courthezon, Citis, Pourra, etc. Their want of depth prevents them from serving as roadsteads for shipping, and they are useful chiefly for fishing, or for the manufacture of bay-salt.

Forests.

Forests.—The artificial or ornamental plantations of France are much fewer in number than those of England, its natural forests far more numerous, the total extent of ground covered by wood being computed at 32,250 square miles, about one-sixth of the surface of the country. There are forests in almost every department. Lower Normandy contains several of considerable extent. There is a large one at Fontainebleau, only 45 miles from Paris, and a larger to the north of the Loire, in the vicinity of Orléans. The department of Ardennes and the mountainous tract that forms the boundary of France on the side of Switzerland abound in forests. The state possesses 991,766 hectares (3830 square miles); 1,903,258 hectares (7348 square miles) belong to the *communes* or to public institutions, and are managed by the state; the rest are private property. They represent a total value of about three thousand millions of francs (£120,000,000 sterling), the annual revenue of which exceeds 38,000,000 francs.

Climate.

Climate.—The climate of France is generally temperate, but by no means uniform. The division into the north, west, south, and central regions, although it seems the most natural, does not satisfactorily correspond to the actual differences. A more convenient division is that of the following four regions or zones:—the region in which the olive-tree is cultivated, which is limited by a line from Bagnères-de-Luchon (Haute-Garonne) to Die (Isère); the region of the maize, or Indian corn, from the mouth of the Gironde to Raon-L'Étape (Vosges); the region of the vine, from the mouth of the Loire to Mézières (Ardennes); and the northern region, which is characterized by the culture of the apple-tree. These limits are, however, far from being absolute; the Indian corn, for example, is successfully cultivated in Brittany, and vineyards are to be found much farther north than the mouth of the river Loire. The north and north-west of France bear a great resemblance, both in temperature and produce, to the south of England, rain occurring frequently, and the country being consequently fit for pasture. In the interior the rains are less frequent, but, when they occur, are far more heavy, so that there is much less difference in the annual rainfall there as compared with the rest of the country than in the number of rainy days; but, on the whole, the climate of the interior is the most pleasant in France, that region being exempt equally from the oppressive heat of the south and the frequent humidity of the north. The great current of wind which prevails in France blows from west to east, from the Atlantic, over the whole surface of the country, except the lower basin of the Rhone, where the *mistral* (a cold wind coming from the north-north-west), the east wind blowing from the Alps, and the south winds do considerable damage both to the produce of the soil and to the health of the inhabitants. Pau, Cannes, Nice, etc., in the south, are much resorted to by invalids, and by English families for winter quarters.

Geology.

Geology.—In a geological point of view France may be divided into three great regions, which comprehend a nearly complete series of the different kinds of soils.

1. *Mountains.*

(*a.*) Granite and Schist.

Alpes.—Part of Isère (S.E.); Drôme; Hautes-Alpes; part of Basses-Alpes (E.); Savoie; Haute-Savoie.

Pyrénées.—Part of Aude (S.E.); Pyrénées-Orientales; part of Ariége (S.), of Haute-Garonne (S.), of Hautes-Pyrénées (S.), and of Basses-Pyrénées (S.W.).

Vosges.—Part of Vosges (E.).

Maures.—Part of Var (S.E.).

(*b.*) Limestone.

Jura.—Doubs; Jura; part of Ain (E.).

Provence.—Part of Basses-Alpes (W.) and of Var (N.W.); Vaucluse; Bouches-du-Rhône.

2. *Plateaus.*

(*a.*) Granite and Schist.

Central Plateau.—Part of Nièvre (E,) and of Saône-et-Loire (W.); Rhône; Loire; Ardèche; part of Gard (W.), of Allier, and of Puy-de-Dôme (E. and W.); Haute-Loire; part of Lozère (N.); Creuse; Haute-Vienne; Corrèze; Cantal; part of Aveyron (N.) and of Tarn (E.).

Ardennes.—Part of Ardennes (N.).

Bretagne.—Part of Orne (W.); Mayenne; part of Maine-et-Loire (W.) and of Deux-Sèvres (N.W.); Manche; Ille-et-Vilaine; Loire-Inférieure; Vendée; Côtes-du-Nord; Morbihan; Finistère.

(*b.*) Limestone.

Causses.—Part of Lozère (S.) and of Aveyron (S.).

Languedoc.—Part of Gard (E.); Hérault.

Quercy.—Lot.

Haut Poitou.—Part of Vienne (S.), of Charente (N.), and of Deux-Sèvres (N.).

Bourgogne.—Haute-Saône; Haute-Marne; Côte-d'Or; part of Yonne (S.E.) and of Nièvre (W.).

Lorraine.—Moselle; Muerthe; part of Vosges (W.); Meuse.

3. *Level Tracts.*

Champagne.—Aube; Marne; Ardennes.

Neustrie.—Nord; Aisne; Seine-et-Marne; part of Yonne (N.W.); Pas-de-Calais; Somme; Oise; Seine-et-Oise; Seine; Loiret; Cher; Seine-Inférieure; Eure; Eure-et-Loire; Loir-et-Cher; Indre; Calvados; part of Orne (E.); Sarthe; Indre-et-Loire; part of Vienne (N.) and of Maine-et-Loire (E.).

Aquitaine.—Part of Tarn (W.) and of Aude (N.W.); Tarn-et-Garonne; part of Haute-Garonne (N.), of Ariége (N.) and of Charente (S.); Dordogne; Lot-et-Garonne; part of Hautes-Pyrénées (N.); Charente-Inférieure; Landes; part of Basses-Pyrénées (N.E.).

Limagne.—Part of Allier (W.) and of Puy-de-Dôme (central part).

Bresse.—Part of Côte-d'Or (E.), of Saône-et-Loire (E.), of Ain (W.) and of Isère (N.W.).

The following table shows the same districts classified according to the nature of their soils. It will be remarked that the Tertiary rock forms nearly the third part of France, whilst the coal-fields are scarcely the two-hundredth part of it.

Primitive rock.—Vendée, part of Brittany, part of the Maures, the Vosges, and the Alps—10,416,000 hectares (40,217 square miles).

Transition rock.—Pyrenees, central part of Brittany, Cotentin, Ardenne, part of the Vosges—5,200,000 hectares (20,077 square miles).

Porphyritic and Carboniferous rocks.—North of Ardenne; north-west of the central plateau; the Maures; small portions of the surface in the Corbières, Brittany, and the Vosges—520,000 hectares (2007 square miles).

Triassic and Permian rock.—East of Lorraine, and a small part of the Vosges—3,480,000 hectares (12,436 square miles).

Jurassic rock.—The Causses, Quercy, and Haut-Poitou; Lorraine and Burgundy; part of the Alps—10,371,000 hectares (39,943 square miles).

Chalk.—Champagne, west of Neustrie, and some places in Aquitaine and the Pyrenees—6,245,700 hectares (24,115 square miles).

Tertiary rock.—The greater part of Neustrie, Limagne, Aquitaine, Bresse, part of Languedoc, Provence, and some places in Brittany and Vendée—14,853,500 hectares (57,350 square miles).

Volcanic rock.—Several masses in the central plateau, and various places in the Causses, Languedoc, Provence, the Maures, and Lorraine—520,000 hectares (2007 square miles).

Alluvial soils.—These are to be found in all valleys, but chiefly near Dunkirk and Niort, and on the Mediterranean coasts—520,000 hectares (2007 square miles).

The *Statisque générale* of France divides the soil thus:—

	Hectares.	Square miles.
Mountainous tracts	4,268,750	16,481
Heaths and moors (landes)	5,670,089	21,892
Soil of rich moulds	7,276,369	28,094
Chalk or limestone	9,788,197	37,793
Gravel	3,417,893	13,196
Stony soil	6,612,348	25,530
Sandy soil	5,921,377	22,863
Clay	2,232,885	8,611
Marshy and swampy soil	284,454	1,098
Miscellaneous	7,290,238	28,148

Or, considering the use rather than the nature of the soil, the surface of France may be divided thus:—

	Hectares.	Square miles.
Arable land	25,500,675	98,460
Forests, woods, and parks	8,800,399	33,978
Heaths and moors (landes)	7,138,282	27,551
Meadowland	5,159,179	19,920
Vineyards	2,088,048	8,062
Roads, streets, public walks, and built lands	1,361,757	5,157
Water	737,587	2,837
Orchards and gardens	627,704	2,423
Chestnut plantations	559,029	2,158
Olive, almond, and mulberry plantations	109,262	421
Miscellaneous	775,753	2,955

II. *Population.*

The population of France, which in 1801 was 27,349,003, was 36,905,788 in 1876, of whom 11,405,000 were living in towns. The following table shows the extent of each department and the population in 1861 and 1876.[1]

	Surface in Square Miles.	Population in 1861.	Population in 1876.
Ain	2,239	369,767	365,462
Aisne	2,839	564,597	560,427
Allier	2,822	356,432	405,783
Alpes (Basses-)	2,685	146,368	136,166
Alpes (Hautes-)	2,158	125,100	119,094
Alpes-Maritimes	1,512	194,578	203,604
Ardèche	2,134	388,529	384,378
Ardennes	2,020	329,111	326,782
Ariége	1,890	251,850	244,795
Aube	2,317	262,785	255,217
Aude	2,438	283,606	300,065
Aveyron	3,376	396,025	413,826
Belfort (territory of)	235	....	68,600
Bouches-du-Rhône	1,971	507,112	556,379
Calvados	2,132	480,992	450,220
Cantal	2,217	240,523	231,086
Charente	2,294	379,081	373,950
Charente-Inférieure	2,636	481,060	465,628
Cher	2,779	323,393	345,613
Corrèze	2,265	310,118	311,535
Corse	3,377	252,889	262,701
Côte-d'Or	3,383	384,140	377,663
Côtes-du-Nord	2,652	628,676	630,957
Creuse	2,150	270,055	278,423
Dordogne	3,545	501,687	489,848
Doubs	2,019	296,280	306,094
Drôme	2,518	326,684	321,756
Eure	2,300	398,661	373,629
Eure-et-Loir	2,268	290,455	283,075
Finistère	2,595	627,304	666,106
Gard	2,253	422,107	423,804
Garonne (Haute-)	2,429	484,081	477,730
Gers	2,425	298,931	283,546
Gironde	3,761	667,193	735,242

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[1] After the cession of territory to Germany in 1871, a single department (Meurthe-et-Moselle) takes the place of two (Meurthe and Moselle), the Bas-Rhin disappears, and of the Haut-Rhin there remains only the territory of Belfort.

	Surface in Square Miles.	Population in 1861.	Population in 1876.
Hérault	2,393	409,391	445,053
Ille-et-Vilaine	2,597	584,930	602,702
Indre	2,624	270,054	281,248
Indre-et-Loire	2,360	323,572	324,875
Isère	3,201	577,748	581,099
Jura	1,928	298,053	288,823
Landes	3,597	300,839	303,508
Loir-et-Cher	2,452	269,029	272,634
Loire	1,838	517,603	590,603
Loire (Haute-)	1,916	305,521	313,721
Loire-Inférieure	2,654	580,207	612,972
Loiret	2,614	352,757	360,903
Lot	2,012	295,542	276,512
Lot-et-Garonne	2,067	332,065	316,920
Lozère	1,996	137,367	138,319
Maine-et-Loire	2,750	526,012	517,258
Manche	2,289	591,421	539,910
Marne	3,159	385,498	407,780
Marne (Haute-)	2,402	254,413	252,448
Mayenne	1,996	375,163	351,933
Meurthe	[2,352]	428,643	
Meurthe-et-Moselle	2,020	....	404,609
Meuse	2,405	305,540	294,054
Morbihan	2,625	486,504	506,573
Moselle	[2,073]	446,457	
Nièvre	2,632	332,814	346,822
Nord	2,193	1,303,380	1,519,585
Oise	2,250	401,417	401,618
Orne	2,354	423,350	392,526
Pas-de-Calais	2,550	724,338	793,140
Puy-de-Dôme	3,070	576,409	570,207
Pyrénées (Basses-)	2,945	436,628	431,525
Pyrénées (Hautes-)	1,750	240,179	238,037
Pyrénées-Orientales	1,592	181,763	197,940
Rhin (Bas-)	[1,758]	577,574	
Rhin (Haut-)	[1,586]	515,802	
Rhône	1,077	662,493	705,131
Saône (Haute-)	2,062	317,183	304,052
Saône-et-Loire	3,302	582,137	614,309
Sarthe	2,397	466,155	446,239
Savoie	2,224	275,039	268,361
Savoie (Haute-)	1,666	267,496	273,801
Seine	184	1,953,660	2,410,849
Seine-Inférieure	2,330	789,988	798,414
Seine-et-Marne	2,215	352,312	347,323
Seine-et-Oise	2,164	513,073	561,990
Sèvres (Deux-)	2,317	328,817	336,655
Somme	2,379	572,646	556,641
Tarn	2,317	353,633	359,232
Tarn-et-Garonne	1,436	232,551	221,364
Var	2,327	315,526	295,763
Vaucluse	1,670	268,255	255,703
Vendée	2,588	395,695	411,781
Vienne	2,691	322,028	330,916
Vienne (Haute-)	2,130	319,595	336,061
Vosges	2,259	415,485	407,082
Yonne	2,868	370,305	359,070
Total	204,147	37,472,732	36,905,788

The annual increase of population in France between 1801 and 1876 has been very small. Allowing for the alterations in extent of territory which took place in 1860 and in 1871, it amounts to about 0·43 per cent.; so that while in England the population during the same period has been doubling in about 53 years, it would require 161 years to bring about a similar result in France. The census of 1876 returned 18,373,639 males and 18,532,149 females, of whom 9,805,761 males and 8,944,386 females were single. In 1874 there were 954,652 births, 981,709 deaths, and 303,113 marriages; of the births 69,294 were illegitimate, and 44,613 were children stillborn. Population is not so dense in France as in the United Kingdom, the proportions being about 181 and 270 inhabitants respectively to the square mile.

	Men.	Women.	Total Number.
Agriculture	4,664,855	1,305,316	5,970,171
Manufactures	2,673,997	1,308,873	3,982,870
Commerce	1,181,514	308,754	1,490,268
Liberal professions	832,692	161,740	994,432
Persons living on their income	545,050	425,534	980,584
Without profession, or profession unknown	....	....	980,939

The preceding table of the population arranged according to employments (exclusive of children and servants) is taken from the census of 1872.

The first of the following tables shows the population for 1832, 1851, and 1876 of the towns in France that had upwards of 50,000 inhabitants in the last-mentioned year:—

	1832.	1851.	1876.
Paris	774,338	1,053,262	1,988,806
Lyons (*Fr.* Lyon)	133,715	156,169	322,612
Marseilles (*Fr.* Marseille)	145,115	185,082	234,690
Bordeaux	99,062	123,935	212,111
Lille	69,073	68,463	137,150
Toulouse	59,630	85,554	120,208
St. Étienne	....	53,741	117,537
Nantes	77,992	91,303	116,093
Rouen	88,086	91,512	104,893
Havre-de-Grâce	23,816	26,410	85,407
Rheims (*Fr.* Reims)	35,971	43,643	80,098
Roubaix	....	31,038	74,946
Brest	29,860	36,492	66,828
Nancy	29,783	40,289	66,303
Amiens	45,001	49,139	61,606
Toulon	28,419	45,510	61,382
Nîmes	41,266	49,480	60,804
Angers	32,743	43,088	55,366
Limoges	27,070	37,010	55,097
Rennes	29,680	33,066	53,598
Montpellier	35,825	40,222	51,838

Towns with from 20,000 to 50,000 Inhabitants in 1876.

Orléans	49,896
Versailles	49,552
Tours	48,325
Nice	46,683
Le Mans	45,709
Dijon	45,607
Grenoble	43,054
Besançon	42,808
Troyes	41,275
Boulogne (Pas de Calais)	40,075
St. Quentin	37,980
Clermont-Ferrand	37,074
Béziers	36,928
Cherbourg	36,338
Dunkirk (*Fr.* Dunkerque)	35,012
Avignon	33,189
Caen	33,072
Tourcoing	33,013
Poitiers	31,692
Bourges	31,102
Lorient	31,000
St. Denis	29,500
Angoulême	28,625
Cette	28,152
Pau	27,553
Arras	26,764
Rochefort	25,454
Laval	25,110
Perpignan	24,379
Carcassonne	23,517
Aix	23,407
Douai	23,348
Périgueux	23,290
Vienne	22,950
Levallois-Perret	22,733
Valenciennes	22,686
St. Pierre-lès-Calais	22,349
Bayonne	22,307
Elbeuf	21,935
Montluçon	21,904
Boulogne (Seine)	21,556
Roanne	21,472
St. Omer	21,404
Moulins	21,122
Neuilly	20,781
Nevers	20,601
Châlon-sur-Saône	20,571
Armentières	20,565
Castres	20,520
Valence	20,476
Niort	20,336
Châlons-sur-Marne	20,215

III. *Government and Administration.*

The Government.

Chamber of deputies.

Senate.

The governments and constitutions which have ruled France since 1789 have been many, and have presented wide differences. We have not, however, to consider here those frequent changes, which belong to history; we have merely to state from a geographical and statistical point of view how France is now governed and administered. The law of the 25th February, 1875, confirmed in France the republican government which had existed from the fall of the empire; but the institutions of the country still bear strong evidence of their monarchical origin and tendency. The sovereignty of the people, acknowledged and proclaimed since 1789, is now represented by three powers,—the chamber of deputies, the senate, and the president of the republic. The deputies are elected by universal suffrage; each district or "arrondissement" sends one deputy to the chamber, if its population does not exceed 100,000, and an additional deputy for every additional 100,000 inhabitants, or fraction of that number. The senate consists of 300 members, the fourth part of whom were at first elected by the national assembly, and hold office for life, each vacancy being filled up by a vote of the senate. The others are elected by special bodies formed, in each department and in the colonies, by the deputies, the general councillors, the councillors of arrondissement, and a delegate of each municipal council. They are in office for nine years,

Departments.	Capital Towns.	Arrondissements.	Ancient Provinces.
Ain	Bourg	5. Bourg; Belley; Gex; Nantua; Trévoux	Bourgogne (Bresse, Bugey, Dombes).
Aisne	Laon	5. Laon; Château-Thierry; Soissons; St. Quentin; Vervins	Ile-de-France; Picardie; Champagne (Brie).
Allier	Moulins	4. Moulins; Gannat; La Palisse; Montluçon	Bourbonnais.
Alpes (Basses-)	Digne	5. Digne; Barcelonnette; Castellane; Forcalquier; Sisteron	Haute-Provence.
Alpes (Hautes-)	Gap	3. Gap; Briançon; Embrun	Haute-Dauphiné; Provence.
Alpes-Maritimes	Nice	3. Nice; Grasse; Puget-Théniers.	
Ardèche	Privas	3. Privas; Largentière; Tournon	Languedoc (Vivarais).
Ardennes	Mézières	5. Mézières; Rethel; Rocroi; Sedan; Vouziers	Champagne (Réthelais, Rémois).
Ariége	Foix	3. Foix; Pamiers; St. Girons.	Foix; Gascogne (Conserans).
Aube	Troyes	5. Troyes; Nogent-sur-Seine; Arcis-sur-Aube; Bar-sur-Aube; Bar-sur-Seine	Champagne; Bourgogne.
Aude	Carcassonne	4. Carcassonne; Castelnaudary; Limoux; Narbonne	Bas Languedoc.
Aveyron	Rodez	5. Rodez; Espalion; Millau; St. Affrique; Villefranche	Guyenne (Rouergue).
Belfort	Belfort	1. Belfort	Alsace.
Bouches-du-Rhône	Marseille	3. Marseille; Aix; Arles	Basse-Provence.
Calvados	Caen	6. Caen; Bayeux; Falaise; Lisieux; Pont-L'Évêque; Vire	Basse-Normandie (Bessin, Bocage).
Cantal	Aurillac	4. Aurillac; Mauriac; Murat; St. Flour	Haute-Auvergne.
Charente	Angoulême	5. Angoulême; Barbezieux; Cognac; Confolens; Ruffec	Angoumois; Charente; Poitou.
Charente-Inférieure	La Rochelle	6. La Rochelle; Jonzac; Marennes; Rochefort; St.-Jean-d'Angely; Saintes	Aunis; Saintonge.
Cher	Bourges	3. Bourges; St. Amand-Mont-Rond; Sancerre	Haut-Berry; Bas-Bourbonnais.
Corrèze	Tulle	3. Tulle; Brive; Ussel	Bas-Limousin.
Côte-d'Or	Dijon	4. Dijon; Beaune; Châtillon-sur-Seine; Semur	Bourgogne (Dijonais, Auxerrois).
Côtes-du-Nord	St. Brieuc	5. St. Brieuc; Dinan; Guingamp; Lannion; Loudéac	Haute-Bretagne.
Creuse	Guéret	4. Guéret; Aubusson; Bourganeuf; Boussac	Haute-Marche.
Dordogne	Périgueux	5. Périgueux; Bergerac; Nontron; Ribérac; Sarlat	Guyenne (Périgord).
Doubs	Besançon	4. Besançon; Baume-les-Dames; Montbéliard; Pontarlier	Franche-Comté; Montbéliard.
Drôme	Valence	4. Valence; Die; Montélimart; Nyons	Bas-Dauphiné.
Eure	Evreux	5. Evreux; Les Andelys; Bernay; Louviers; Pont-Audemer	Haute-Normandie (Evreux, Vexin Normand).
Eure-et-Loir	Chartres	4. Chartres; Châteaudun; Dreux; Nogent-le-Rotrou	Orléanais (Pays chartrain); Perche.
Finistère	Quimper	5. Quimper; Brest; Châteaulin; Morlaix; Quimperlé	Basse-Bretagne.
Gard	Nîmes	4. Nîmes; Alais; Le Vigan; Uzès	Bas-Languedoc.
Garonne (Haute-)	Toulouse	4. Toulouse; Muret; St. Gaudens; Villefranche	Haute-Languedoc; Gascogne (Comminges).
Gers	Auch	5. Auch; Condom; Lectoure; Lombez; Mirande	Gascogne (Astarac, Armagnac).
Gironde	Bordeaux	6. Bordeaux; Bazas; Blaye; La Réole; Lesparre; Libourne	Guyenne (Bordelais, Médoc, Bazadais).
Hérault	Montpellier	4. Montpellier; Béziers; Lodève; St. Pons	Bas-Languedoc.
Ille-et-Vilaine	Rennes	6. Rennes; Fougères; Montfort; Redon; St. Malo; Vitré	Haute-Bretagne.
Indre	Châteauroux	4. Châteauroux; Le Blanc; La Châtre; Issoudun	Bas-Berry; Touraine.
Indre-et-Loire	Tours	3. Tours; Chinon; Loches	Touraine; Anjou; Orléanais; Poitou.
Isère	Grenoble	4. Grenoble; La-Tour-du-Pin; St. Marcellin; Vienne	Haut-Dauphiné (Graisivaudan); Bas-Dauphiné (Viennois).
Jura	Lons-le-Saulnier	4. Lons-le-Saulnier; Dôle; Poligny; St. Claude	Franche-Comté (Aval).
Landes	Mont-de-Marsan	3. Mont-de-Marsan; Dax; St. Sever	Gascogne (Landes, Chalosse).
Loire	St. Étienne	3. St. Étienne; Montbrison; Roanne	Lyonnais (Forez, Beaujolais).
Loire (Haute-)	Le Puy	3. Le Puy; Brioude; Yssingeaux	Languedoc (Velay, Haute-Auvergne).
Loire-Inférieure	Nantes	5. Nantes; Ancenis; Châteaubriant; Paimbœuf; St. Nazaire	Haute-Bretagne.
Loiret	Orléans	4. Orléans; Gien; Montargis; Pithiviers	Orléanais (Sologne, Gâtinais).
Loir-et-Cher	Blois	3. Blois; Romorantin; Vendôme	Orléanais (Blaisois, Beauce).
Lot	Cahors	3. Cahors; Figeac; Gourdon	Guyenne (Quercy).
Lot-et-Garonne	Agen	4. Agen; Marmande; Nérac; Villeneuve-d'Agen	Guyenne (Agénois, Gascogne).
Lozère	Mende	3. Mende; Florac; Marjevols	Languedoc (Gévaudan).
Maine-et-Loire	Angers	5. Angers; Baugé; Cholet; Saumur; Segré	Anjou.
Manche	St. Lô	6. St. Lô; Avranches; Cherbourg; Coutances; Mortain; Valognes	Basse-Normandie (Cotentin).
Marne	Châlons	5. Châlons; Épernay; Rheims; Ste. Menehould; Vitry-le-François	Champagne (Brie, Perthois, Rémois).
Haute-Marne	Chaumont	3. Chaumont; Langres; Vassy	Champagne (Bastigny, Vallage).
Mayenne	Laval	3. Laval; Château-Gontier; Mayenne	Haut-Maine; Haut-Anjou.
Meurthe-et-Moselle	Nancy	4. Nancy; Briey; Lunéville; Toul	Lorraine (Toulois).
Meuse	Bar-le-Duc	4. Bar-le-Duc; Commercy; Montmédy; Verdun	Lorraine (Bar, Verdunois).
Morbihan	Vannes	4. Vannes; Lorient; Ploërmel; Pontivy	Basse-Bretagne.
Nièvre	Nevers	4. Nevers; Château-Chinon; Clamecy; Cosne	Nivernais; Orléanais; Bourgogne.
Nord	Lille	7. Lille; Avesnes; Cambrai; Douai; Dunkirk; Hazebrouck; Valenciennes	Flandre; Hainaut (Cambrésis).
Oise	Beauvais	4. Beauvais; Clermont; Compiègne; Senlis	Ile-de-France; Beauvaisis (Vexin); Haute-Picardie.
Orne	Alençon	4. Alençon; Argentan; Domfront; Mortagne	Normandie (Marches, Houlme); Maine (Perche).
Pas-de-Calais	Arras	6. Arras; Béthune; Boulogne; Montreuil-sur-Mer; St.-Omer; St.-Pol	Artois; Picardie; Boulonnois.
Puy-de-Dôme	Clermont-Ferrand	5. Clermont-Ferrand; Ambert; Issoire; Riom; Thiers	Basse-Auvergne (Limagne).
Pyrénées (Basses-)	Pau	5. Pau; Bayonne; Mauléon; Oloron; Orthez	Béarn; Basse-Navarre; Gascogne (Soule, Labour).
Pyrénées (Hautes-)	Tarbes	3. Tarbes; Argèles; Bagnères	Gascogne (Bigorre, les Quatre-Vallées).
Pyrénées-Orientales	Perpignan	3. Perpignan; Céret; Prades	Roussillon (Cerdagne); Bas-Languedoc.
Rhône	Lyon	2. Lyon; Villefranche	Lyonnais; Beaujolais.
Saône (Haute-)	Vesoul	3. Vesoul; Gray; Lure	Franche-Comté (Amont).
Saône-et-Loire	Mâcon	5. Mâcon; Autun; Châlon-sur-Saône; Charolles; Louhans	Bourgogne (Mâconnais, Charolais).
Sarthe	Le Mans	4. Le Mans; La Flèche; Mamers; St. Calais	Bas-Maine; Haut-Anjou.
Savoie	Chambéry	4. Chambéry; Albertville; Moutiers; St.-Jean-de-Maurienne.	
Savoie (Haute-)	Annecy	4. Annecy; Bonneville; St. Julien; Thonon.	
Seine	Paris	3. Paris; St. Denis; Sceaux	Ile-de-France.
Seine-et-Marne	Melun	5. Melun; Coulommiers; Fontainebleau; Meaux; Provins	Ile-de-France (Gâtinais, Brie); Champagne.
Seine-et-Oise	Versailles	6. Versailles: Corbeil; Étampes; Mantes; Pontoise; Rambouillet	Ile-de-France (Hurepoix, Mantais, Vexin Gâtinais).
Seine-Inférieure	Rouen	5. Rouen; Dieppe; Le Havre; Neufchâtel; Yvetot.	Haute-Normandie (Roumois, Caux, Bray).
Sèvres (Deux)	Niort	4. Niort; Bressuire; Melle; Parthenay	Haut-Poitou.
Somme	Amiens	5. Amiens; Abbeville; Doullens; Montdidier; Péronne	Picardie.

Departments.	Capital Towns.	Arrondissements.	Ancient Provinces.
TARN	Alby	4. Alby; Castres; Gaillac; Lavaur	Haut-Languedoc (Albigeois).
TARN-ET-GARONNE	Montauban	3. Montauban; Castel-Sarrasin; Moissac	Guyenne; Gascogne; Languedoc.
VAR	Draguignan	3. Draguignan; Brignoles; Toulon	Basse-Provence.
VAUCLUSE	Avignon	4. Avignon; Apt; Carpentras; Orange	Comtat; Haute-Provence.
VENDÉE	La Roche-sur-Yon	3. La Roche-sur-Yon; Fontenay-le-Comte; Les Sables-d'Olonne	Bas-Poitou.
VIENNE	Poitiers	5. Poitiers; Châtellerault; Civray; Loudun; Montmorillon	Haut-Poitou.
VIENNE (HAUTE-)	Limoges	4. Limoges; Bellac; Rochechouart; St. Yrieix	Haut-Limousin; Basse-Marche.
VOSGES	Épinal	5. Épinal; Mirecourt; Neuchâteau; Remiremont; St. Dié	Lorraine (Vosges).
YONNE	Auxerre	5. Auxerre; Avallon; Joigny; Sens; Tonnerre	Bourgogne (Auxerrois); Champagne (Sénonais).
CORSE	Ajaccio	5. Ajaccio; Bastia; Calvi; Corte; Sartène	Corse.

Prior to 1790 France was divided into thirty-two great and eight small military governments, often called provinces, which are, however, to be distinguished from the provinces formed under the feudal system. The great governments were—Alsace, Angoumois, Anjou, Artois, Aunis and Saintonge, Auvergne, Béarn and Navarre, Berri, Bourbonnais, Bourgogne (Burgundy), Bretagne (Brittany), Champagne, Dauphiné, Flandres, Foix, Franche-Comté, Guyenne and Gascogne (Gascony), Ile-de-France, Languedoc, Limousin, Lorraine, Lyonnais, Maine, Marche, Nivernais, Normandie, Orléanais, Picardie, Poitou, Provence, Roussillon, and Touraine. The eight small governments were—Paris, Boulogne and Boulonnais, Le Havre, Sedan, Toulois, Pays Messin and Verdunois, Saumurois, and Corse. See Plate XIII.

and every third year are partly renewed.

President.

The president of the republic is chosen for seven years by the senate and chamber of deputies voting together. He promulgates the laws passed by the parliament; he has the command of the land and sea forces, but cannot declare war without the advice of the chambers; he makes treaties of peace, alliance, and commerce, nominates to all Government offices, and has power to dissolve the chamber of deputies, with the sanction of the senate. He receives a yearly salary of 600,000 francs, with an allowance of

Civil list.

162,400 francs for household expenses. Senators and deputies have an allowance of 9000 francs each per annum. It may here be interesting to compare the salary now paid to the president of the republic with the civil list or revenue of the various dynasties which have successively ruled France since the beginning of the century. Louis XVIII. had 15,510,000 francs per annum, and 4,000,000 were allowed to the royal family. Charles X. got 25,000,000 for himself and 7,000,000 for the princes. Louis Philippe was satisfied with 12,000,000 francs a year, and adequate allowances to his children. And lastly, the second empire cost 25,000,000 francs a year, not including the pensions to the members of the imperial family, the revenues of the palaces, castles, and forests, and those mysterious resources which have become known by the name of *virements.*

Council of state.

Next to these three great powers must be mentioned the council of state, presided over by the minister of justice, and composed of a vice-president, 22 councillors in ordinary service, 15 councillors in extraordinary service, representing the different ministers, 24 *maîtres des requêtes*, 20 auditors of first class, 10 auditors of second class, a general secretary having the title and rank of a *maître des requêtes*, and a *secrétaire du contentieux.* The auditors are appointed after a competitive examination; the councillors in ordinary service are elected by the chamber, and the other members of the council of state are nominated by the president of the republic. The business of the council is to give its advice on the projects of law which the parliament or the Government wish to submit to it, and on administrative regulations and by-laws. All disputes arising in matters of administration, and all claims or complaints against administrative officials, are brought before the council of state, whose decision is final. The vice-president receives a salary of 25,000 francs, the presidents of sections or committees 18,000 francs, the councillors 16,000, the *maîtres des requêtes* 8000 francs, and the auditors of first class 4000 francs; auditors of second class have no remuneration.

Ministers.

The executive department of the Government is administered by the president of the republic and his cabinet council, consisting of nine ministers, viz.:—the minister of justice and keeper of the seals; the minister of foreign affairs; the minister of the interior; the minister of finance; the minister of war; the minister of marine and colonies; the minister of public instruction, ecclesiastical affairs, and the fine arts; the minister of agriculture and commerce; and the minister of public works. They are appointed by the president of the republic, and are reponsible to the chamber. They receive a salary which has been reduced from 100,000 to 60,000 francs, and may live, if they choose, in the "hôtels" where the duties of their ministry are discharged.

Administrative divisions.

Administratively, France is divided into 87 departments cut rather arbitrarily out of the territory of the ancient provinces. These departments are subdivided into 362 "arrondissements," 2865 "cantons," and about 36,000 "communes." The table on pages 449–50 contains a list of the departments, with their capital towns and arrondissements, and also a reference to the old division into provinces.

Departmental administration.

Each department is administered by a prefect appointed by the president of the republic, and each arrondissement by a sub-prefect. The prefects are divided into three classes, the salary being 35,000 francs for the first class, 24,000 for the second class, and 18,000 for the third class. The prefect of the Seine has 50,000 francs a year. The authority of each prefect is great in his own department: he can issue local decrees; he appoints and dismisses a number of agents who depend directly on him; he is at the head of the police to maintain public order, and for this purpose can summon the military forces; he superintends the collection of taxes; he is in correspondence with all the subordinate functionaries in his department, to whom he transmits the orders and instructions of the ministers; in one word, he is the general agent of Government, and the principal instrument of centralization in the state. He is assisted in his work by two bodies, the general council (*conseil général*), which is elected by universal suffrage, and the council of prefecture, which is nominated by the head of the executive power. The business of the council of prefecture is to decide all legal questions and to advise the prefect, when asked to do so. The general councils assess the taxes, authorize the purchase, sale, or exchange of departmental property, superintend the management of the same, decide about new roads, railways, or canals, vote the budget for sanitary and charitable institutions belonging to the department, and give advice on every matter of local interest, political questions being strictly excluded. The law of the 23d February, 1872, however, has invested them with great political importance; in case of the parliament being violently dissolved by a *coup d'état*, they must immediately assemble, and form a new parliament with their delegates, in order to oppose by all means the criminal attempt.

Arrondissement.

As the prefect in the department, so the sub-prefect, with a more limited authority, is the representative of the central power in the arrondissement. He is assisted, and to a certain extent controlled, in his work by the council of arrondissement—an elective body to which each canton of the arrondissement sends one member. Except in that case, the canton is not an administrative division. It will be noticed again in connection with the judicial system of the country.

Commune.

The commune is the administrative unit in France. At its head is a mayor assisted by deputy-mayors (*adjoints*), the number of whom varies according to the population; communes of 2500 inhabitants have one deputy-mayor; up to 10,000 inhabitants they have two, from 10,000 to 30,000 three, and one additional for every 20,000. The mayor has a double part to perform, as he represents both the central power and the commune; and often it is a difficult matter to avoid a conflict of duties. He is besides *officier de l'état civil*, or official registrar of births, marriages, and deaths. The mayor and deputy-

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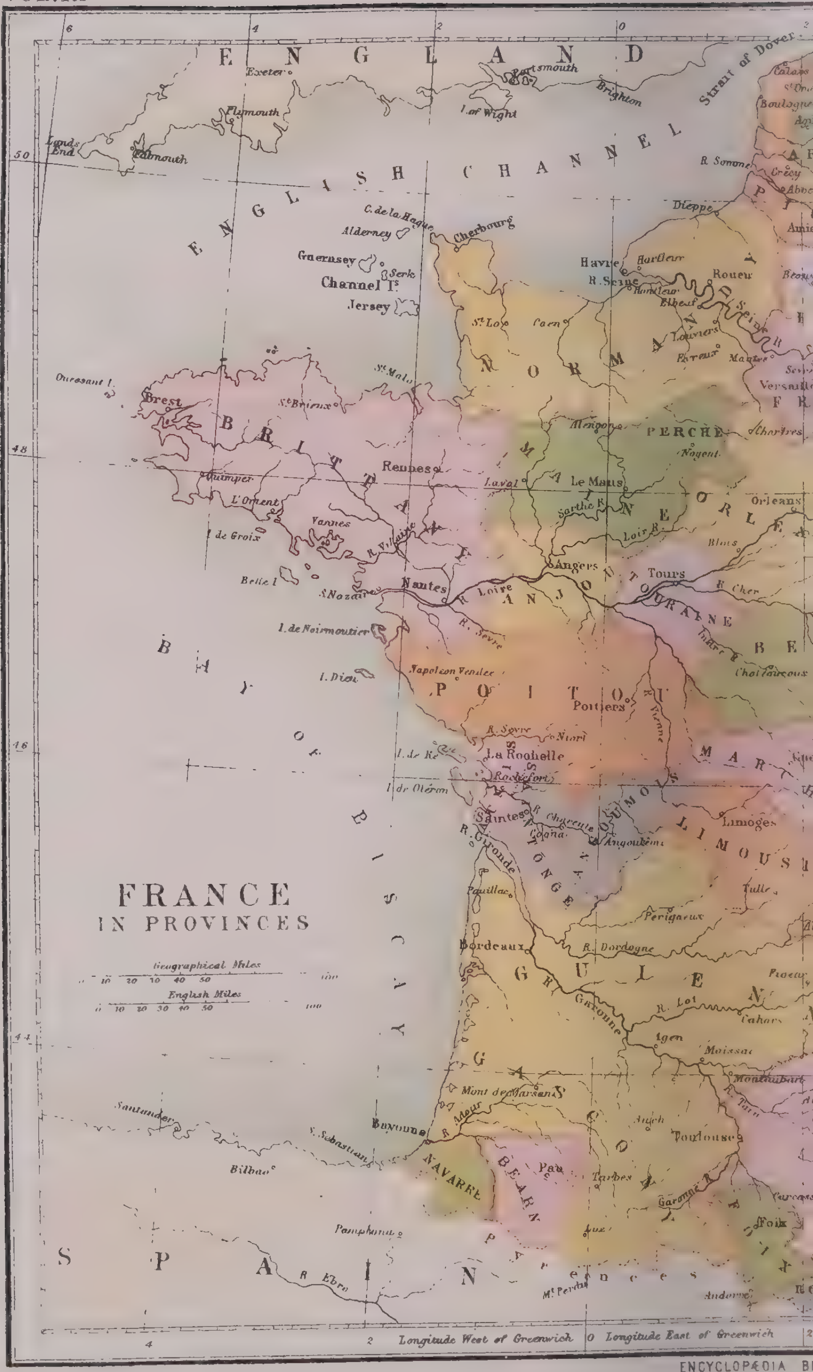

ENCYCLOPÆDIA B

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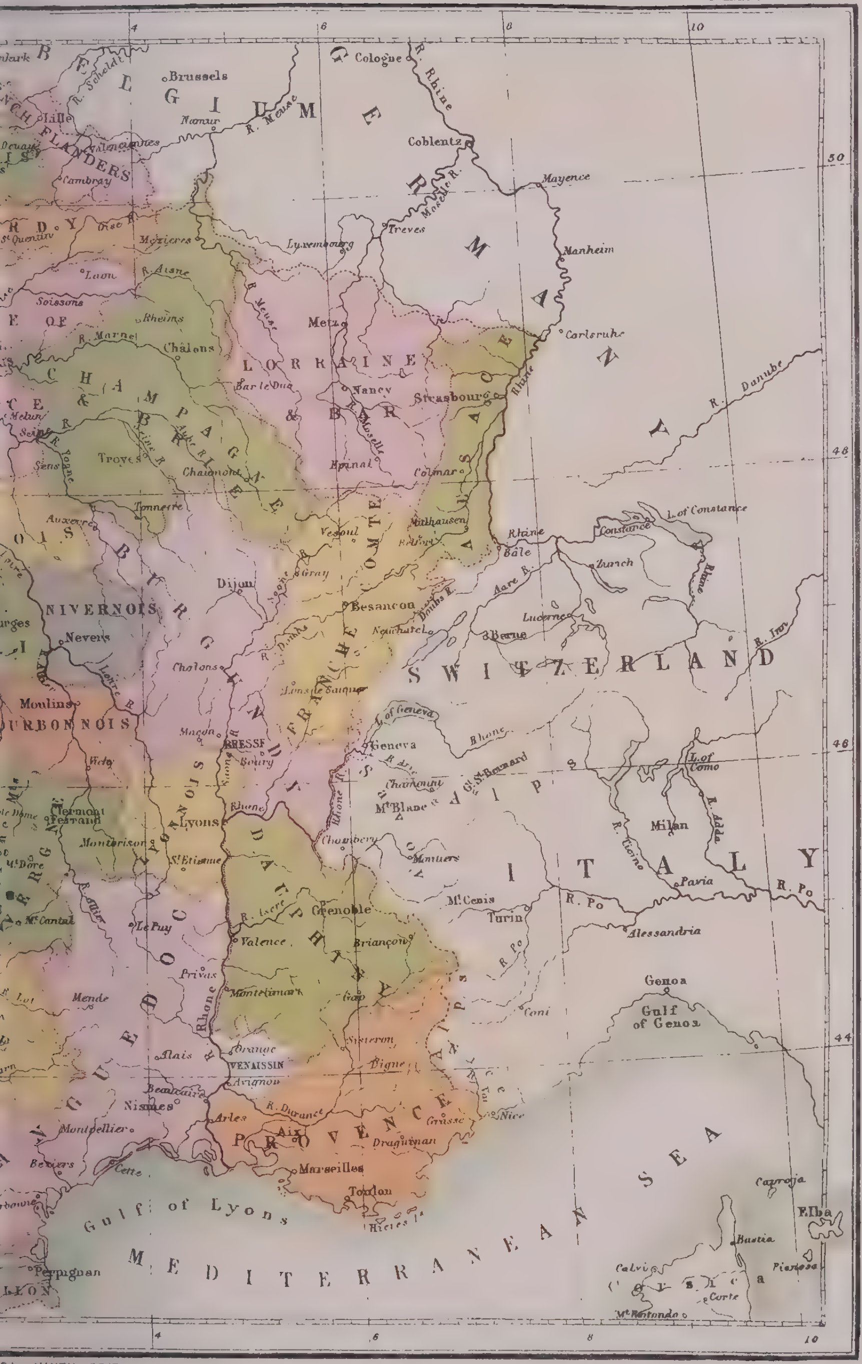
PLATE XIII



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mayor are not salaried officials. In the large towns they are nominated by Government, but they must always be chosen out of the municipal council, which is elected on the principle of universal suffrage, and has with regard to the commune much the same power and duties as the general council with regard to the department.

Every canton must have a commissary of police, who is under the direct control of the mayor. This police-officer is appointed by the prefect in towns having not more than 6000 inhabitants, and by the president of the republic in the others. He has rather complex duties, being at the same time a governmental, judicial, and municipal agent.

Paris and Lyons have in some respects a special and exceptional administration, the consideration of which belongs to the articles devoted to these cities.

IV. *Law and Administration of Justice.*

Judicial proceedings may be classed under civil, commercial, and criminal jurisdictions; there are besides some special departments, such as military and maritime tribunals, councils of discipline, and the *cour des comptes*.

Juge de paix.

In civil matters, every canton has a *juge de paix*, whose decision is final when the amount in dispute does not exceed 100 francs (£4); up to 200 francs, he only can give a sentence subject to appeal. His principal business is, however, one of conciliation; and no suit can be brought before the tribunal of first instance till he has endeavored without success to bring the parties to agreement.

Primary and appeal courts.

A tribunal of first instance, or primary court, is established in every arrondissement. Its decision may be appealed against for sums above 1500 francs. The *cours d'appel* decide the actions when the sentence of the first court has been appealed from. They are 26 in number, established in the following towns:—

Cours d'Appel.	Departments depending on them.
PARIS	Seine, Aube, Eure-et-Loir, Marne, Seine-et-Marne, Seine-et-Oise, Yonne.
AGEN	Gers, Lot, Lot-et-Garonne.
AIX	Basses-Alpes, Alpes-Maritimes, Bouches-du-Rhône, Var.
AMIENS	Aisne, Oise, Somme.
ANGERS	Maine-et-Loire, Mayenne, Sarthe.
BASTIA	Corse.
BESANÇON	Doubs, Jura, Haute-Saône, Belfort.
BORDEAUX	Charente, Dordogne, Gironde.
BOURGES	Cher, Indre, Nièvre.
CAEN	Calvados, Manche, Orne.
CHAMBÉRY	Savoie, Haute-Savoie.
DIJON	Côte-d'Or, Haute-Marne, Saône-et-Loire.
DOUAI	Nord, Pas-de-Calais.
GRENOBLE	Hautes-Alpes, Drôme, Isère.
LIMOGES	Corrèze, Creuse, Haute-Vienne.
LYONS	Ain, Loire, Rhône.
MONTPELLIER	Aude, Aveyron, Hérault, Pyrénées-Orientales.
NANCY	Meurthe-et-Moselle, Meuse, Vosges, Ardennes.
NÎMES	Ardèche, Gard, Lozère, Vaucluse.
ORLÉANS	Indre-et-Loire, Loir-et Cher, Loiret.
PAU	Landes, Basses-Pyrénées, Hautes-Pyrénées.
POITIERS	Charente-Inférieure, Deux-Sèvres, Vendée, Vienne.
RENNES	Côtes-du-Nord, Finistère, Ille-et-Vilaine, Loire-Inférieure, Morbihan.
RIOM	Allier, Cantal, Haute-Loire, Puy-de-Dôme.
ROUEN	Eure, Seine-Inférieure.
TOULOUSE	Ariége, Haute-Garonne, Tarn, Tarn-et-Garonne.

Tribunals of commerce.

Tribunals of commerce to decide disputed points arising out of business transactions are instituted in all the more important commercial towns, and consist of judges chosen from among the leading merchants, and elected by their fellows. For sums above 1500 francs there can be appeal from their decision. In small towns, the judges of the civil tribunal decide such commercial cases.

Criminal courts.

The courts of criminal jurisdiction are of three kinds. The tribunals of ordinary police (that is, the justice of the peace court in each canton) have the cognizance of small offences, which are punishable by a fine not exceeding 15 francs (12s.), or by imprisonment not exceeding 5 days. Offences of a more serious character, which French law calls *délits*, are judged by a special section of the tribunals of first instance, bearing the name of *tribunal correctionnel*. This tribunal can be appealed to from the sentences pronounced by tribunals of police; but its judgments are also subject to the revision of the *cours d'appel*. Offences which rank as crimes are judged by the *cour d'assises*, consisting of three magistrates and twelve jurors. The jury, as in England, decides only on the facts of the case, leaving the application of the law to the judges. The assizes are the only courts that are not stationary. They are held in the chief towns of the departments once in three months. In all criminal suits, the first inquiry is confided to a special magistrate attached to the tribunal, called *juge d'instruction*. He conducts the necessary investigations privately and with almost absolute power. An order of *non-lieu* issued by this magistrate at once puts an end to any prosecution. But if he finds that the case should go to trial, he hands it over to the court, before which a public prosecutor, with the title of *procureur*, or *procureur-général de la république*, maintains and endeavors to prove the accusation.

Court of cassation.

Above these various tribunals the court of cassation stands supreme. It is held at Paris, and is composed of three chambers, the *chambre des requêtes*, the *chambre civile*, and the *chambre criminelle*. Its province is to decide in all appeals from the other courts, investigating, not the facts of the case, but the forms of law, and ordering, wherever these have been infringed or deviated from, a new trial before such other tribunal as it thinks fit.

Special courts.

Among the special jurisdictions may be mentioned the military tribunals or councils of war, which sit in judgment on crimes and offences committed by soldiers, or by civilians in a town or district proclaimed by the Government as in a state of siege; the maritime tribunals, which are to the navy what the councils of war are to the land forces; and the councils of discipline for lawyers and other professional corporations. The *cour des comptes* deserves special notice. It consists of three chambers, with a president in chief over the whole court, and three presidents (one for each chamber), a general procurator, a chief *greffier*, 102 councillors, 20 auditors, and 81 clerks. This important institution, which costs 1,554,500 francs a year, was created in 1807 in order to control all the accounts of the Government officials. Certain agents who are not magistrates are, however, connected with the administration of justice. Such are the *greffiers* (clerks of the court), who keep the archives, and receive a salary from the Government; the *huissers* (sheriff-officers), who give notice of summonses and sentences; and the *avoués* (solicitors) and the public notaries (*notaires*).

Statistics of justice (1874.)

Statistics of Justice (1874).—In 1874 the *juges de paix* had before their bar, with a view to private settlement, a total of 2,160,116 cases, and brought the parties to an agreement in 856,340, a result which is hardly satisfactory. As judges they had on their rolls 391,129 cases, to which 5166 electorial disputes must be added. Their decisions were appealed from in 4460 cases. There were 125,248 cases on the rolls of the civil tribunals of first instance. The commercial courts had 255,333 cases before them, 5596 of which were cases of failure or bankruptcy. In 1850 the number was only 138,027. The decisions of the various courts above mentioned were followed by 10,555 appeals, which were brought before the *cours d'appel*. In about 67 per cent. of these the original sentences were confirmed. Of offences 168,835 were brought under the consideration of the *tribunaux correctionnels*, 171,431 males, and 31,678 females being implicated in them. Of these 7509 were under sixteen years of age, and 146,588 above twenty-one. The tribunals acquitted 13,506. Out of 7949 appeals the *cours d'appel* confirmed about three-fourths of the original sentences, and in 1206 cases increased the punishment awarded by the *tribunaux correctionnels*. The jury and judges of assize courts tried 4084 cases, affecting 5228 prisoners, 4368 being males and 860 females: 55 were under sixteen years of age, 799 under twenty-one, and 284 above sixty; 2818 were unmarried; and nearly the half of the number consisted of people living in towns; 170 only had received a good education; 1810 could not read, and 2160 could read and write but imperfectly. The jurors found 1056 prisoners not guilty; 31 were condemned to death, 151 to hard labor for life, 972 to hard labor for a limited time, 1 to transportation; 29, who were under 16 years of age, were sent to houses of correction; sentences of imprisonment for various periods were passed on the others, except two, who were fined. Four women were among the prisoners condemned to death; the sentence was carried out in the case of 13 of the convicts; the others, including one of the women, had their sentences commuted. Besides these criminal cases, the *cours d'assise* had to decide on 20 alleged infringements of the laws and regulations affecting the liberty of the press, and on 10 political offences, consisting of speeches, cries, or displaying of emblems considered as seditious. The accused were 52 in number, of whom 28 were acquitted, 4 fined, and 20 sent to prison. There were 1100 criminal cases brought before the *cour de cassation*, which has the same jurisdiction in criminal matters as in civil. In a large majority of cases it confirmed the decrees of the tribunals, only 103 having been sent back for a new trial.

Prisons.

Prisons.—Although the prisons are attached to the ministry of the interior, it is impossible to treat of the administration of justice without saying a word about them. The convicts who have to serve more than one year are distributed into 24 central prisons (*maisons centrales*). Departmental prisons receive those whose sentence does not exceed one year. Political convicts are kept in custody in the two *maisons de détention* of Doullens (Somme) and Belle-Ile (Morbihan). Two places of transportation, Cayenne and New Caledonia, receive those who were formerly confined in *bagnes*, or convict prisons. The population of these penal colonies is considerably increased by the victims of internal discord; for in France it seems as if the victorious party thought that by banishing its opponents from their native land it could eradicate the ideas for which they unsuccessfully fought. The expenses of these different penitentiary establishments amount to about 18,500,000 francs. On the other hand, the produce of prison labor has a value of 2,800,000 francs.

Police.

Police.—The public peace is maintained by an armed police or *gendarmerie*, partly on foot and partly mounted; and in all emergencies, when this force is found insufficient for the preservation or execution of the laws, the troops may be called in to assist, subject, however, to the orders of the police. About 7000 *gardiens de la paix*, formerly *sergents de ville* (policemen), under the orders of the prefect of police, form in Paris an additional police force; and similar organizations exist in all the larger towns.

V. *Religion.*

Three churches are recognized and supported by the state in France,—the Roman Catholic, the Protestant (subdivided into Calvinist and Lutheran), and the Hebrew. In Algeria the Mussulman creed is equally recognized.

Roman Catholics.

Roman Catholic.—The Roman Catholic Church is much stronger than the others. It may perhaps be said that France is the country where this church is the most powerful; at any rate, it has there its most perfect organization, and raises the largest sums of money; and it is to France that, directly or indirectly, the Holy See appeals in all its difficulties. Most of the provisions of the "concordat" concluded in 1801 between the first consul Bonaparte and Pope Pius VII. are still in force. France is divided into dioceses, each governed by an archbishop or a bishop, and the dioceses into parishes, each of which has at its head a *curé*, or parish priest. Archbishops and bishops are appointed by the head of the Government and confirmed by the pope; the archbishop of Paris receives a salary of 50,000 francs, and the others are paid 20,000 francs a year. The stipend of the bishops is 15,000 francs per annum. In 1789 France contained 135 dioceses, 18 of which were archbishoprics. The Constituent Assembly made the dioceses correspond exactly with the departments; but this was changed by the concordat of 1815. The archbishoprics and bishoprics now existing in France are as follows:—

Archbishoprics.	Bishoprics.
Paris	Chartres, Meaux, Orléans, Blois, Versailles.
Aix, Arles, and Embrun	Marseilles, Fréjus and Toulon, Digne, Gap, Nice, Ajaccio.
Albi	Rodez, Cahors, Mende, Perpignan.
Auch	Aire and Dax, Tarbes, Bayonne.
Avignon	Nîmes, Valence, Viviers, Montpellier.
Besançon	Verdun, Belley, St. Dié, Nancy.
Bordeaux	Agen, Angoulême, Poitiers, Périgueux, La Rochelle, Luçon.
Bourges	Clermont, Limoges, Le Puy, Tulle, St. Flour.
Cambrai	Arras.
Chambéry	Annecy, Tarentaise, Maurienne.
Lyons and Vienne	Autun, Langres, Dijon, St. Claude, Grenoble.
Rheims	Soissons, Châlons-sur-Marne, Beauvais, Amiens.
Rennes	Quimper, Vannes, St. Brieuc.
Rouen	Bayeux, Evreux, Sées, Coutances.
Sens and Auxerre	Troyes, Nevers, Moulins.
Toulouse and Narbonne	Montauban, Pamiers, Carcassonne.
Tours	Le Mans, Angers, Nantes, Laval.

Every archbishop has three vicars-general, and every bishop two, making a total of 190. They are assisted by a chapter attached to each cathedral church, and presided over by the bishop. The *curés* have a minimum salary which varies from 1500 to 1200 francs, but additional money may be allowed by the municipal councils. They also receive the fees charged for baptisms, marriages, funerals, and extra masses, and have the benefit of a free house called a *presbytère*. The *curés* are about 3500 in number, and are assisted by curates (*vicaires*), and by *desservants*, the latter being priests attached to *succursales* or chapels-of-ease in large parishes. In 1873 the sums paid to the prelates and priests of France by the Government amounted to 39,382,495 francs—about two and a half millions more than in 1859.

The Roman Catholic Church possesses in France 89 *grands séminaires*, in which special instruction is given to young men who intend to enter the church, and 150 *petits séminaires*, or establishments of secondary education, by which the clergy endeavor to rival the *lycées* of Government. There are besides a number of schools and colleges kept by the Jesuits and other religious bodies. A recent law has even allowed the clergy to found independent universities, which will be noticed in the chapter on education. Convents are very numerous in France, especially for females. They are inhabited by about 140,000 persons (including 120,000 women), whose property is worth more than a thousand millions of francs.

Protestants.

Protestants.—The *Église Réformée* (Calvinist Church) has about one million of members in France, distributed into parishes, which form 103 consistories, and 21 synodal districts, including Algeria. The Lutheran Church (*Église de la Confession d'Augsbourg*) is far inferior in number. It is ruled by a directory, now sitting in Paris, instead of Strasburg as formerly. Sixty-one pastors compose the staff of this Church, whilst the Calvinist Church has 600. The seminary of the latter is at Montauban, and that of the former at Paris since the loss of Strasburg.

Jews.

Jews.—The Hebrew Church is administered by a central consistory presided over by the chief rabbi. It is subdivided into eight provincial consistories, sitting respectively at Paris, Lyons, Bordeaux, Nancy, Marseilles, Bayonne, Lille, and Vesoul. Their seminary used to be at Metz, but has been transferred to Paris.

VI. *Education.*

Ministry of instruction.

The National Convention laid the foundation of the system of public instruction that is still in force in France; the Government of the first Napoleon developed and completed it. At the head of public instruction is a minister, who has the title of grand-master of the university, this term describing not an institution for liberal education as in Great Britain and Germany, but the branch of administration under which public instruction in its universality is placed. The minister appoints all the officers of university administration, and fills up all the vacancies in colleges and schools. He is assisted by the superior council of public instruction, which has to examine the books adopted in schools and colleges, to judge and remove incompetent teachers,—in short, to watch over the concerns and interests of public instruction in all its branches. Attached to this council are 19 inspectors-general, who visit the principal establishments in the country for the purpose of inquiring into their management and the way in which instruction is conducted.

Academies.

Académies.—The whole territory of France is divided into 16 *académies*, or districts of educational jurisdiction, a list of which is appended.

Académies.	Departments included in them.
Paris	Seine, Cher, Eure-et-Loir, Loir-et-Cher, Loiret, Marne, Oise, Seine-et-Marne, Seine-et-Oise.
Aix.	Bouches-du-Rhône, Basses-Alpes, Alpes-Maritimes, Corse, Var, Vaucluse.
Besançon	Doubs, Jura, Haute-Saône.
Bordeaux	Gironde, Dordogne, Landes, Lot-et-Garonne, Basses-Pyrénées.
Caen	Calvados, Eure, Manche, Orne, Sarthe, Seine-Inférieure.

CHAMBÉRY	Savoie, Haute-Savoie.
CLERMONT-FERRAND	Puy-de-Dôme, Allier, Cantal, Corrèze, Creuse, Haute-Loire.
DIJON	Côte-d'Or, Aube, Haute-Marne, Nièvre, Yonne.
DOUAI	Nord, Aisne, Ardennes, Pas-de-Calais, Somme.
GRENOBLE	Isère, Hautes-Alpes, Ardèche, Drôme.
LYONS	Rhône, Ain, Loire, Saône-et-Loire.
MONTPELLIER	Hérault,, Aude, Gard, Lozère, Pyrénées-Orientales.
NANCY	Meurthe-et-Moselle, Meuse, Vosges.
POITIERS	Vienne, Charente, Charente-Inférieure, Indre, Indre-et-Loire, Deux-Sèvres, Vendée, Haute-Vienne.
RENNES	Ille-et-Vilaine, Côtes-du-Nord, Finistère, Loire-Inférieure, Maine-et-Loire, Mayenne, Morbihan.
TOULOUSE	Haute-Garonne, Ariége, Aveyron, Gers, Lot, Hautes-Pyrénées, Tarn, Tarn-et-Garonne.

At the head of each *académie* is a rector, assisted by an academical council, and by the inspectors of the district. His business is to superintend all the schools, colleges, and faculties within the bounds of his educational province, and to serve as the organ of communication between the inferior officials and the minister of public instruction. In the *académie* of Paris the rector is the minister himself, who is represented by a vice-rector. The rectors have not, however, the entire management of all educational matters, for primary schools are mostly under the superintendence of the perfect and of a departmental council.

Higher education.

Superior education is given by faculties of theology, law, medicine, sciences, and literature. The faculties of theology are established at Paris, Aix, Bordeaux, Lyons, Rouen, Montauban; those of law at Paris, Toulouse, Aix, Caen, Dijon, Poitiers, Rheims, Bordeaux, Grenoble, Douai, Nancy; those of medicine at Paris, Montpellier, Nancy; those of sciences at Paris, Besançon, Rennes, Caen, Bordeaux, Clermont, Poitiers, Dijon, Grenoble, Lille, Nancy, Lyons, Marseilles, Montpellier, Toulouse; and those of literature at Paris, Aix, Besançon, Bordeaux, Caen, Clermont, Dijon, Douai, Grenoble, Lyons, Montpellier, Poitiers, Rennes, Toulouse, Nancy. The faculties not only impart superior teaching, but are also examining bodies, which confer the degrees of bachelor, licentiate, and doctor.

Secondary education.

Primary schools.

The teaching work of the faculties is in some measure shared by 3 superior schools of pharmacy established in the same towns as the faculties of medicine, 22 preparatory schools of medicine and pharmacy, 5 preparatory schools of science and literature (at Angers, Lyons, Nantes, Chambéry, Rouen), and by the *École pratique des Hautes Études*, founded in 1868 at Paris. Secondary education is given in 80 *lycées*, attended by about 37,000 pupils, and 244 *collèges communaux*, with an attendance which is not much inferior in number to that of the *lycées*; but the organization of many of them is still in an imperfect state. The third and lowest stage of national instruction is that of the *écoles primaires* or primary schools. Every commune of 500 inhabitants has to maintain a boys' and a girls' school. The law is not yet very strictly observed; in 1871 the total number of schools was 51,881, of which 20,374 were boys' schools, 14,837 schools for girls, and 16,670 schools attended by girls and boys together. Primary instruction steadily gains ground in France, although it is neither gratuitous—except when parents cannot pay for it—nor obligatory by law. In 1827 only 420 out of 1000 could read; in 1857 this average had risen to 675, and in 1867 to 775. The following table was published in 1873 by the general bureau of statistics:—

Age.	Can neither write nor read.	Can read.	Can read and write.	Instruction not ascertained.	Total.
Under 6 years	3,540,101	292,348	151,595	38,042	4,022,086
From 6 to 20 years	2,082,338	1,175,125	5,458,097	70,721	8,786,281
Above 20 years	7,702,362	2,305,130	13,073,057	214,005	23,294,554
	13,324,801	3,772,603	18,682,749	322,768	36,102,921

Training schools.

To provide the staff of teachers necessary for these educational establishments, training schools (*écoles normales*) have been instituted. The *écoles normales primaires* are now 90 in number,—79 for the training of male and 11 for the training of female teachers. The *école normale supérieure*, founded by the decree of the 9th Brumaire, year III. (30th October, 1794), provides for the education of professors for the *lycées* or *facultés*; it maintains 100 students, who, during a course of three years, not only attain considerable proficiency in literature and science, but are trained to the art of communicating their knowledge to others in an attractive and interesting form. It is not, however, necessary to have gone through the course of study of the *école normale* to become a secondary teacher or a faculty professor; the condition required of students of the *école normale*, as of others, is to pass a series of examinations, and to acquire the degrees of *bachelier*, *licencié*, and *agrégé*, the last being the only one conferring rights of membership in the university.

The law of the 21st June, 1865, has laid down in the lycées and communal colleges a special course of teaching, more especially intended to prepare pupils for commercial and industrial pursuits; it is called *enseignement secondaire spécial*. A normal school, for the training of teachers who choose this line, was founded at Cluny (Saône-et-Loire) in 1868.

Private and special schools.

Private Educational Establishments.—The systematic provision thus made by the state for public instruction in France is supplemented in various ways. Not only may any one who possesses the diploma of bachelor engage in the work of primary and secondary education on his own account, but recently by a special law sanction has been given to the existence of institutions for superior instruction distinct from those of the state. The Roman Catholic clergy have not been slow to take advantage of this new state of things, and have established universities in which students may get their degrees, as in the old university of France. In 1872 there were, besides the governmental schools, 657 establishments for secondary education directed by laymen, and 278 by priests, the latter giving instruction to 34,000 pupils, whilst the 657 others were only attended by 43,000. There are other high class schools devoted to various special purposes, and not in all cases depending on the minister of public instruction. Such are the *École des chartes*, in which twenty students are trained during a three years' course to study the documents and historical remains of the Middle Ages; the *École des langues orientales*; the *École des beaux-arts*, which every year sends to Rome its best pupil in each of the departments of painting, sculpture, and architecture; the *École de Rome et Athènes*, where young *savants* find the opportunity of studying antiquities in the two great capitals of the ancient world; several special schools for the teaching of drawing and mathematics applied to the industrial arts at Paris, Lyons, and Dijon; the *École polytechnique*, in which the highest scientific education is imparted to young men who have passed a very difficult preliminary examination, and who wish to prepare themselves for the ordnance office, for engineering, or for high positions in the different branches of administration; the *École spéciale militaire*, established at St. Cyr for officers; the *École de cavalerie*, at Saumur; the *Prytanée militaire*, at La Flèche, in which gratuitious instruction is given to sons of officers, and non-commissioned officers; the *École d'application d'état-major*, for the training of staff officers; the *École d'application de l'artillerie et du génie*, at Fontainebleau, formerly at Metz, where old students of the polytechnic school receive a more special and developed instruction; the naval school at Brest; the *École d'application du génie maritime*, for students of the polytechnic school who are intended for maritime engineering; the *École d'hydrographie*, for sea-captains; the *École des ponts et chaussées*, which is under the minister of public works and prepares the old students of the polytechnic school for civil engineering; the *École des mines*, towards which a stage in the polytechnic school is also a first and necessary step; the *Conservatoire des arts et métiers*, under the control of the minister of agriculture and commerce; the *École centrale des arts et manufactures*, for the training of private engineers and manufacturers; the schools of *arts et métiers*, established at Châlons-sur-Marne, Angers, and Aix; the *École forestière*, at Nancy, which trains the administrators of the forests belonging to the state and to the communes; the agricultural schools of Grignon (Seine-et-Oise), Grandjouan (Loire-Inférieure), and Montpellier (Hérault); the veterinary schools of Alfort (Seine), Toulouse, and Lyons; the *Maisons d'éducation de la légion d'honneur* at St. Denis, Ecouen, and Les Loges, for daughters of knights of the Legion of Honor in straitened circumstances.

Notice must also be taken of the *Collége de France*, in which 34 professors deliver lectures to the public on almost every branch of human knowledge; the *Muséum d'histoire naturelle*, with 16 lecturers; and the chair of archæology attached to the national library of Paris. Government supports three great establishments devoted to astronomical study—the *Bureau des Longitudes* and the observatories of Paris and Marseilles.

The Institute.

The highest institution founded and kept up by the French Government on behalf of science and literature is the *Institut de France*, composed of five Academies as follows:—

Academies.	Sec-tions.	Members.	Honorary Members.	Foreign Members.
Académie Française	...	40	...	...
Académie des Inscriptions et Belles-lettres	11	40	10	8
Académie des Sciences	11	63	10	8
Académie des Beaux-Arts	5	40	10	10
Académie des Sciences morales et politiques	6	40	5	5

The *Académie de Médecine* is a separate body, divided into 11 sections; it is composed of 100 resident members, and a number of fellows and correspondents, chosen from among the medical celebrities of the world.

VII. *Charitable Institutions.*

Although there is no poor law in France, charitable establishments, either private or created and managed by the state, are very numerous, and, on the whole, efficient. *Orphelinats* (orphans' houses) receive infants which have neither parents nor friends to care for them; *crèches* and *salles d'asile* (infant schools) gratuitously give shelter and the first elements of education to poor children whose mothers must earn their daily bread by out-door work; young girls of the destitute class may learn a trade in the *ouvroirs* or workshops freely open to them in many towns; whilst lads find employment and agricultural training in such establishments as the *colonies agricoles* of Mesnil-St.-Firmin (Oise), St. Jean, Petit-Mettray (Somme), Lesparre (Gironde), Montmorillon (Vienne), etc. There are also other charitable institutions, analogous to those which exist in other countries. Besides these private charities, more or less supported by Government grants, there is a special department, called *assistance publique*, a branch of the minister of the interior, established to superintend, and in some cases organize, the *bureaux de bienfaisance* and hospitals. The *bureaux de bienfaisance* give out-door relief to the poor when it is deemed necessary. They are 12,989 in number, or about 36 *bureaux* for every 100 communes, a proportion quite inadequate—there should be one for each commune. In 1873 these bureaux assisted 1,312,847 people, or an average of 3·61 per cent.; but this help is still very unequally distributed, the average being 18 per 100 in the department of the North, and under 0·35 per 100 in the departments of Corsica, Ardèche, and Pyrénées-Orientales. The total amount of their disbursements, covered by foundations, grants, a tax on the theatres, and private gifts, is about 12,500,000 francs, which gives an average of less than 17 francs (13s. 8d.) for each pauper assisted. The same inequality appears here; for, whilst in the department of the Seine the average is 26·95 francs (£1, 1s. 7d.) per head, it falls as low as 6·45 francs (5s. 2d.) in less favored districts.

Hospitals.

The number of hospitals, in addition to the *Maison Municipale de Santé* and the seven great establishments of Paris, is 1481, furnished with 161,520 beds, and employing 2673 physicians and surgeons, 3212 officials, 11,032 nuns, and 11,534 servants. In 1873 the number of patients received was 410,441,—that is, 1 patient for 88 inhabitants. Out of 100 patients, 79 were discharged cured, at least for a time, and the death average was not above 9 per cent. Besides the patients who only pass through the wards (37 days is the average duration of their stay), 69,786 infirm, incurable, or old people live as inmates in some of the hospitals, which are specially designated by the name *hospice;* this number is divided into 27,256 men, 31,037 women, and 11,493 children. This population of invalids, both in *hôpitals* and *hospices*, was maintained at a cost of 93,269,886 francs.

It must be confessed that all these means of relief, good as they are, provide but very insufficiently for the wants of the million of poor which France reckons among her 36 millions of inhabitants. Pauperism is, there as elsewhere, a sore which civilization has been as yet quite unable to heal.

Lunatic asylums.

The census of 1872 shows that there were at that time 87,968 lunatics in France, an average of 2·44 for 1000 inhabitants. Of these 51,004 were kept at home, and 36,964 in asylums, public or private. In 1873 the number of asylums in France was 102, of which 61 were public; of the 41 private asylums 17 received the poor gratuitously. These asylums, at the end of the year, contained 41,064 inmates, of whom only about 8000 were able to pay for board and attendance; the rest were paupers. The average number of cures was 6 per cent., and of these part only would be permanent.

VIII. *Finance.*

Ministry of finance.

All the agents who have the charge of collecting taxes are under the minister of finance, who, besides, distributes to the other departments the sums necessary for their expenses. In each department a *trésorier payeur général* receives the taxes raised in his district, and is accountable for them to the central office of the treasury at Paris. These *trésoriers payeurs généraux* have a salary of 6000 francs a year, but they also get a percentage on the amount of taxes collected, and are allowed to transact private banking business with the funds of the state, as well as with their own. As security they have, before entering on their duties, to deposit with the treasury a sum which varies with the importance of their situation, but on an average amounts to 800,000 francs. A part of their business is to pay the creditors of the state in their respective departments. They are assisted in their work by *receveurs particuliers* in each arrondissement, except that in which the *trésorier payeur général* resides. These officials have a salary of 2400 francs a year, and a percentage on the amount that they collect. The security which they are bound to give is five times their total income.

Direct taxes.

The taxes that pass through the hands first of the *receveurs particuliers*, then of the *trésoriers payeurs généraux*, and finally into the treasury, are of two kinds, direct and indirect. The land tax, the poll and rent-tax, the tax on doors and windows, the license tax, and the tax on money invested in public funds or in bonds of private companies (*valeurs mobilières*) are now the chief sources of the direct revenue of the French treasury. The land-tax or *contribution foncière* is assessed on the net revenue of landed property. In order to obtain as correct a valuation as possible, a land register book was commenced in 1821, in which every piece of ground has to be described, with its extent and value, and the name of the owner. This work is not yet quite completed, and the continual changes which occur in the ownership of holdings, as well as in value or size, will always prevent it from being perfect. As it is, this gives the average net revenue of assessed land in France as amounting to 1,053,907,113 francs 56 centimes. In 1874 this yielded to the treasury a revenue of 169,905,814 francs. Each citizen owes to the state the value of three days' work; this is the *contribution personnelle* (poll tax). The value of a day's work varies with the districts; but it cannot exceed 1 franc 50 centimes (1s. 2½d.) or be less than 50 centimes (5d.). Every proprietor or tenant, except paupers, soldiers in service, and foreign diplomatic or consular agents, is assessed in proportion to the rent of the house he lives in. This tax, which is collected along with the preceding one, is distinctively called *contribution mobilière*. In 1875 the *contribution personnelle mobilière* gave a return of about 56 millions of francs.

The tax on doors and windows rises in proportion to the population of the communes or towns, the average being 30 centimes (3d.) for one aperture in communes having under 5000 inhabitants, and 1 franc (10d.) in those of 100,000 inhabitants and upwards. In 1871 the 8,467,483 houses in France were divided thus:

Houses with one aperture	276,384
" two apertures	1,883,924
" three apertures	1,601,050
" four apertures	1,112,024
" five apertures	793,551
" six and upwards	2,800,550

The value of the assessment was 43,275,000 francs in 1875; but the enormous number of houses having only one door, and of those having two doors without a window, or one door and one window, tells strongly against the wisdom of such a tax.

The license tax is imposed on every person carrying on any business whatever; physicians, bankers, and manufacturers are subject to this tax, as well as the humblest shopkeeper. On the 1st January, 1873, 1,529,363 names were on the rolls as *patentés*, and the amount produced by the tax was for the same year 73,726,331 francs.

A law of the 29th June, 1872, has established a tax of 3 per cent. on the income derived from money invested in the public funds and from bonds and shares in commercial or industrial companies. This tax, added to other duties previously established, as the stamp and the duty of *transmission*, raises to 7½ per cent. the charges that this kind of property has to bear.

Tax collectors.

These various taxes are collected by agents called *percepteurs*, under the orders of the *receveurs particuliers* or *trésoriers payeurs généraux.* Their number is 7000,—hardly enough for the amount and intricacy of the work they have to do. They are paid, not by a salary, but by a percentage on the money they raise. The collecting of other less important taxes, as the tax on mortmain, on mines, on weights and measures, on houses and carriages, on billiards and clubs, is also entrusted to them.

Excise.

The excise revenue, or *contributions indirectes*, is managed by a central office at Paris, with a *directeur général*, three *administrateurs*, and 94 other officials and clerks of various ranks. Each department has a *directeur*, assisted by *inspecteurs, sous-directeurs*, and *contrôleurs.* Under this head are comprised the taxes on intoxicating drinks, salt, tobacco, gunpowder, on public coaches and railways, on gold and silver work, on sugar, paper, matches, soap, stearine, salad oil, receipt stamps; also the navigation dues, bridge tolls, and a few other special taxes of little importance. The excise appears on the budget of 1877 for a sum of 1,039,293,800 francs. The taxes on paper, soap, stearine, oil, matches, etc., have been established in consequence of the war of 1870–71. A numerous staff is employed to collect these duties. Besides the high functionaries mentioned above and their clerks, there are 1795 *receveurs ambulants*, with 4637 *commis;* alcohol, matches, paper, salt, etc., require 218 officials; 200 are employed to collect the navigation tax; 2038 are attached to the manufactures of sugar, etc. The total number is above 19,000.

Customs.

For a long time the customs (*douane*) were only a branch of the administration of the *contributions indirectes*, but since 1869 they have formed a special office, at the head of which is a *directeur général*, with a salary of 25,000 francs, assisted by two *administrateurs* and 93 clerks. As far as this office is concerned, France is divided into 26 districts, administered by 26 *directeurs*, residing at Dunkirk, Lille, Valenciennes, Charleville, Nancy, Épinal, Besançon, Bourg, Lyons, Chambéry, Nice, Marseilles, Montpellier, Perpignan, Bayonne, Bordeaux, La Rochelle, Nantes, Vannes, Brest, St. Brieuc, Caen, Rouen, Le Havre, Boulogne, and Bastia. These directors have under them 81 inspectors, 71 sub-inspectors, and 130 clerks of all ranks. An armed force, composed of 245 captains, 469 lieutenants, 4056 non-commissioned officers, and 14,207 privates (*préposés*), is distributed along the frontiers to prevent smuggling; for the same purpose 1257 sailors, commanded by 371 *patrons* and *sous-patrons*, keep guard along the coasts. The customs contributed to the budget of 1877 a sum of 268,355,800 francs, and their collection cost 30,362,105 francs.

Other sources of revenue.

There are still other sources from which money flows into the treasury. The administration of the *enregistrement, timbre, et domaines* yielded 634,605,451 francs in 1877. This sum is made up—(1) by the fees charged for the registration of all legal documents and deeds; (2) by shooting and hunting licenses; (3) by the sale of stamps; (4) by the revenues and sales of state property; and (5) by fines of various sorts and the cost to the public of legal proceedings. From this amount 19,038,400 francs must be deducted, being the expenditure required to pay the expense of collection. The public forests and those managed by the state gave a return of 38,548,680 francs, and cost 12,995,732 francs. For all purposes connected with these taxes the country is divided into 32 districts, administered by as many *conservateurs*, whose residences are Paris, Rouen, Dijon, Nancy, Amiens, Troyes, Épinal, Châlons-sur-Marne, Besançon, Lons-le-Saulnier, Grenoble, Alençon, Bar-le-Duc, Macon, Toulouse, Tours, Bourges, Moulins, Pau, Rennes, Niort, Carcassonne, Aix, Nîmes, Aurillac, Bordeaux, Ajaccio, Chaumont, Vesoul, Chambéry, Nice, and Valence. The post-office department employs about 32,000 officials, at a cost of about 71,500,000 francs, and yielded 116,126,000 francs in 1877. The telegraph service is under the minister of the interior. In 1872, 123,000 kilometres (76,430 miles) of wires were laid along distances of 44,965 kilometres (27,940 miles). In 1877 the total income from this source amounted to 16,600,000 francs. The income from other less important resources, which cannot here be noticed in detail, may be estimated at not much less than 2 millions of francs.

National debt.

The total income of the public treasury in France, including the revenues of the departments and communes, is above 3,000,000,000 francs (£120,000,000), which is more than any other nation has to pay for the expenses of its government; and yet this enormous sum has not been sufficient to meet the wants of the state, for repeated loans have constantly increased the public debt. Not taking into account the petty payments of all sorts that Government has always to make, the public debt is divided into funded (*dette consolidée*) and floating debt (*dette flottante*). The funded debt is not subject to reimbursement, but only to the payment of a certain interest fixed by law. This debt, which was arranged by the law of the 9th of Vendémiaire, year VI. (27th September, 1797), to liquidate the old debts of the monarchy, then amounted to 40,216,000 francs of interest to be paid yearly to the creditors. From 1800 to 1814 it increased by 23,091,635 francs; and the Government of the Restoration added 101,260,463 francs, making a total of 164,568,100 francs in interest. Louis Philippe carried it to 176,845,367 francs, and at the time of the *coup d'état* it amounted to 230,768,863 francs. The second empire, during a period of eighteen years, created 168,187,663 francs of consols, thus charging France with an annual payment of 398,956,526 francs. As an unavoidable consequence of the Prussian war, the funded debt has been still further increased, so that the interest was 748,593,642 francs in 1874, and 747,571,030 francs in 1877, which gives an average of about 21 francs per head of the population.

The floating debt, which the Government contracts either by receiving private deposits and using them for its needs or by issuing bills of exchange called *bons du trésor*, amounted in 1872 to 761,000,000 francs. This part of the public debt, including some other items under the name of *capitaux remboursables à divers titres*, appears in the budget of 1877 for the much lower figure of 300,226,686 francs.

Budget for 1877.

The following table gives a summary of the budget proposed for 1877:—

Expenditure.	Francs.
Ministry of justice and religion	87,960,485
" foreign affairs	12,720,500
" interior	81,528,386
" finance	1,497,042,632
" war	531,148,836
" marine and colonies	186,622,116
" public instruction and the fine arts	56,628,762
" agriculture and commerce	19,762,388
" public works	238,246,535
Government of Algeria	24,587,322
	2,736,247,962

Receipts.	
Direct taxes	412,470,600
Indirect taxes (excise)	1,039,293,800
Enregistrement, timbre, et domaines	634,605,451
Forests	38,548,680
Customs	268,355,800
Post-office	116,126,000
Miscellaneous revenues	227,600,481
	2,737,003,812

IX. *Army and Navy.*

Army.

The principle that every citizen is a soldier is the foundation of the military system of France; but it has received a new force and a more complete application from the law of the 27th July, 1872. According to this law, every young man of twenty years of age, free from bodily defects, owes to the country five years of active service, five years in the territorial army, and six years in the reserve of the territorial army. The chief causes of exemption are physical infirmities and diminutive stature (the standard of height being 1 metre 54 centimetres or 60·631 inches). In a family of orphans, or of a widow, or

Compulsory service.

of a septuagenarian, or of blind parents, the eldest son is also exempt. If the eldest son is himself blind or invalid, the next one enjoys the privilege. Exemptions are likewise granted to brothers of soldiers on active service, or that have died when so engaged, or that have been pensioned, and to the elder of two brothers who should, on account of their age, be included in the same levy. Men serving in the navy, students of the Polytechnic school, of the *École forestière École des Langues orientales vivantes*, and *École des Chartes*, public teachers, and ministers of any of the religions recognized by the state are not called upon, but must serve the public in their respective capacities during a period which varies from five to ten years. In 1875, out of a total number of 283,768, 72,065 were exempted, 29,797 of them because of unfitness to serve, and 30,073 were deducted from the contingent as serving the state in some of the ways mentioned above. The law authorizes young men who hold the diploma of *bachelier*, or a certificate bearing that their studies have been carried on at a public school to a certain fixed standard (*certificat d'études*), and those who pass a special examination held for the purpose, to engage for one year as voluntary recruits, at the end of which they are sent home, provided they can give evidence of having received a good military training; but they are always, as long as they have not served for the time fixed by law, subject to be called out again in case of need. In 1875, 9804 men took advantage of this partial exemption. Voluntary enlistments are also permitted in the French army, which are binding for a period of not less than two years and not more than five. Many soldiers who have completed their legal time of service contract a re-engagement. Such *engagés volontaires* receive extra pay, but no bounty as formerly. They numbered 24,091 in 1875.

Military organization.

The minister of war is assisted at Paris by 2 general directors, a brigade major (*chef d'état major*), a historiographer, a law agent, and 434 other functionaries of various ranks, attended by 108 servants; the whole costs 1,895,350 francs a year.

Under the control of this central office, the army is divided into 19 corps, quartered in 19 territorial districts, Algeria being one of them. The infantry is composed of 144 regiments (three battalions of six companies each forming a regiment), numbering in all 225,111 men; 30 battalions of *chasseurs à pied* (light infantry), with 8 companies in each battalion, giving a total of 18,889 men; 4 regiments of *zouaves*, 12,000 men; 3 African battalions of light infantry, 3000 men; 5 *compagnies de discipline*, 1000 men; 1 foreign regiment, 3000 men; and 3 regiments of natives (Algerians), 9000 men. The cavalry consists of 75 regiments, viz., 12 cuirassiers, 26 dragoons, 19 *chasseurs* and 11 hussars,—numbering 47,498 men; 4 regiments of *chasseurs d'Afrique*, 3812 men; and 3 regiments of spahis, 2134 men. The ordnance comprises 38 regiments, each of them having 3 batteries served by foot soldiers, and 6 mounted batteries,—in all 42,500 men; 1 regiment of pontoon soldiers, 1877 men; 15 companies of workmen (*ouvriers*) and pyrotechnists (*artificiers*), in all 2215 men; 50 *compagnies du train*, 3870 men. There are 3 regiments of engineers, numbering 9000 men. Finally, 8000 men, distributed into 64 companies, are specially charged with the *équipages militaires*. The *gendarmerie* and the republican guard of Paris (mounted police) are also, for all military duties, under the orders of the minister of war, and now form a corps of about 40,000 men. France has thus in time of peace an effective force of about 440,000 men.

The French army is commanded by a staff of 5 marshals, 121 generals of division, and 200 generals of brigade. There are besides 81 generals of division and 197 generals of brigade on the rolls of the reserve.

The following table shows the division of France into 19 military districts:—

ALGERIA.	
AMIENS	Aisne, Oise, Somme, part of Seine-et-Oise, and Seine.
BESANÇON	Ain, Doubs, Jura, Haute-Marne, Belfort, Haute-Saône, part of Rhône.
BORDEAUX	Charente-Inférieure, Gironde, Landes, Basses-Pyrénées, Hautes-Pyrénées.
BOURGES	Cher, Côte-d'Or, Nièvre, Saône-et-Loire, part of Rhône.
CHÂLONS-SUR-MARNE	Ardennes, Aube, Marne, Meuse, Vosges, Meurthe-et-Moselle.
CLERMONT-FERRAND	Allier, Loire, Puy-de-Dôme, Haute-Loire, Cantal, part of Rhône.
GRENOBLE	Hautes-Alpes, Drôme, Isère, Savoie, Haute-Savoie, part of Rhône.
LE MANS	Eure-et-Loir, Mayenne, Orne, Sarthe, part of Seine-et-Oise, and Seine.
LILLE	Nord, Pas-de-Calais.
LIMOGES	Charente, Corrèze, Creuse, Dordogne, Haute-Vienne.
MARSEILLES	Basses-Alpes, Alpes-Maritimes, Corse, Bouches-du-Rhône, Gard, Ardèche, Var, Vaucluse.
MONTPELLIER	Aude, Aveyron, Hérault, Lozère, Tarn, Pyrénées-Orientales.
NANTES	Finistère, Loire-Inférieure, Morbihan, Vendée.
ORLÉANS	Loiret, Loir-et-Cher, Seine-et-Marne, Yonne, part of Seine-et-Oise and of Seine.
RENNES	Côtes-du-Nord, Manche, Ille-et-Vilaine.
ROUEN	Calvados, Eure, Seine-Inférieure, part of Seine-et-Oise and of Seine.
TOULOUSE	Ariége, Haute-Garonne, Gers, Lot, Lot-et-Garonne, Tarn-et-Garonne.
TOURS	Maine-et-Loire, Indre-et-Loire, Deux-Sèvres, Vienne.

National guard.

The national guard no longer exists; one of the first measures of the Government of M. Thiers, after crushing the Parisian insurrection of 1871, was to suppress it.

Hôtel des Invalides.

Some institutions must be mentioned here as attached to the war department, and completing the military organization of France. The Hôtel des Invalides was founded by Louis XIV. as a house of refuge for old infirm soldiers of all grades; but the number of the inmates is always decreasing, as old soldiers now generally prefer to live at home on their pensions and private resources, rather than to live in common apart from their families and under military discipline. In 1875 the *Invalides* numbered only 642; but the same year the maintenance of the Hôtel cost the state 1,123,053 francs. The order of the Legion of Honor, founded by Bonaparte in 1802, embraces both soldiers and civilians among its members. It is composed of knights (*chevaliers*), officers, commanders, grand-officers, and grand-crosses. The chief of the government of France has the title of grand master, and is the head of the order, which is managed by a grand chancellor and a council, the members of which are appointed by the president of the republic, as well as all the *légionnaires*, whose number is now about 38,500. A military medal, with a yearly pension of 100 francs, has been awarded, since 1852, to private soldiers and non-commissioned officers who have distinguished themselves in the service or on the field.

Legion of Honor.

Navy.

Under the minister of the navy and the control office at Paris, which employs 260 officials, there are five maritime prefects, one in each of the maritime arrondissements of France. These are—Cherbourg, with the subdivisions of Dunkirk and Le Havre; Brest, with St. Servan; Lorient, with Nantes; Rochefort, with Bordeaux; and Toulon, with Marseilles, Nice, and Bastia.

The naval officers in active service are—2 admirals, 18 vice-admirals, 30 rear-admirals, 343 captains of ships or frigates, and about 1377 lieutenants and officers of inferior rank. There are besides 14 vice-admirals and 20 rear-admirals on the rolls of the reserve.

The recruiting of sailors for the navy is secured by the *inscription maritime*, established by Colbert in 1681, and regulated since by various decrees and laws. According to the law as it now stands, all fishermen and men employed on board merchant ships must have their names inscribed in a special register, and are bound to give, whenever required, a minimum of three years' service in the navy. In 1873 this register contained 151,830 names. A special body of ordnance, called *artillerie de marine*, is composed of 243 officers and 4216 soldiers, part of whom are in garrison in the colonies. The general staff of the naval ordnance at Paris is composed of a general of division, 2 generals of brigade in active service and 2 in the reserve, 1 colonel, 2 lieutenant-colonels, and a few subaltern officers. The administration is divided into 6 directions, the seats of which are Cherbourg, Brest, Rochefort, Toulon, Lorient, and La Villeneuve.

The marines in the fleet number about 15,000, divided into 4 regiments with 780 officers, and a staff consisting of

2 generals of division, 4 generals of brigade, 1 chief of battalion, and 3 aides-de-camp.

The fleet consisted in 1876 of 110 vessels of all sizes (10 of them iron-clads of first and second rank), armed with 529 guns, and of a reserve comprising 18 iron-clads and 60 other vessels.

X. *Roads.—Railways.—Navigable Rivers and Canals.—Harbors.*

Before referring to the state of agriculture, manufactures, and commerce in France, it is important to have an idea of the means of communication by which the different productive districts are connected with one another. The minister of public works has the superintendence of all roads and ways, natural or artificial, by land or by water. A special department, called *Administration des Ponts et Chaussées*, assisted by a council with the minister as its president, is charged with the management of that important branch of public business; 569 engineers and inspectors, and 2153 inferior officials form the administrative staff.

Roads.

Roads are either national, departmental, military, or *vicinal* (cross roads). National roads are kept up entirely at the expense of the public treasury. The departments have to provide for departmental roads and a portion of the military roads, the rest being charged on the state. As to cross roads, or *chemins vicinaux,* they depend, by an awkward anomaly, on the ministry of the interior, and are kept up by the communes, or, when of a higher importance, by the departments. At the end of 1811, 229 roads were classified as imperial roads. They extended over a length of 46,500 kilometres (28,894 miles). In 1815, after the territory of France had been brought back to its ancient limits, the length was only 27,200 kilometres (16,901 miles); in 1873 there were 223 national roads, giving a total of 37,304 kilometres (23,180 miles), 2627 kilometres (1632 miles) of which are still paved like a street. The average breadth of that class of road is 16 metres (52 feet 6 inches), 6 metres for the causeway, 6 for the sideways, and 4 for the ditches and embankment. Although the great extension of railways has somewhat reduced the importance of high roads, it has been calculated that the traffic has changed very little during the last twenty years. The departmental roads are not quite so wide as the national ones, their average breadth being 12 metres (39 feet). In 1872 their length was 46,939 kilometres (29,167 miles). Military roads were made in the west of France, after the last insurrection of Vendée. They are 28 in number, distributed in the departments of Charente-Inférieure, Ille-et-Vilaine, Loire-Inférieure, Maine-et-Loire, Mayenne, Sarthe, Deux-Sèvres, and Vendée, and extend to a length of about 1500 kilometres (932 miles).

A sum of nearly 34 millions of francs is spent yearly for the purpose of making new roads or repairing old ones. The *chemins vicinaux,* or cross roads establishing a communication between rural places not far distant from each other, are managed by a special branch of the department of the minister of the interior; about 3000 *agents-voyers* and 42,000 *cantonniers* or workmen are specially charged with the duty of keeping them in repair. In 1872 these roads, divided into three classes according to their importance, were 544,390 kilometres (338,273 miles) in length, and covered a surface of about 370,000 hectares (915,000 acres). To the very considerable resources which the communes must apply to the extension and repair of their rural roads the Government used to add a yearly grant of 11,500,000 francs; but this sum has been reduced to 5,750,000 francs since 1873. The *Annales* of the administration of the *Ponts et Chaussées* mention 1982 large bridges, of which 79 are cast iron. The chief are the bridge over the Gironde at Bordeaux, which has 17 arches, is 501 metres (1643 feet) in length, and cost 6,850,000 francs; the bridge of Cubzac, over the river Dordogne; the turning bridge of Penfeld at Brest; the bridge St. Esprit, over the Rhone, with 18 arches on a length of 730 metres (2395 feet); those of Toulouse, Libourne, Tours, and Rouen; the new bridge (*Pont-Neuf*) and the bridge of Iéna at Paris; and the bridge of La Guillotière at Lyons.

Railways.

Although the system of railways in France is far from being so complete as in England and Belgium, the country is now traversed by great lines which connect together all the principal towns; and lines of less importance have been made, or will ere long be established, in every district. The chief lines, which are worked by powerful companies under the superintendence of the state, are—(1) the *Chemins de fer du Nord,* which run between Paris and Soissons, Boulogne, Calais, Rouen, Amiens, etc., traverse the coal districts of Picardy, and reach the Belgian territory at Quiévrain and at Tournay; (2) the *Chemins de fer de l'Est,* from Paris to Strasburg, Mulhouse, and Basel in Switzerland, through Alsace, with branch lines to Sedan, Metz, Luxembourg, Rheims, Sarreguemines, etc., joining Belgian and Prussian railways at several points of the frontier; (3) the *Chemins de fer de l'Ouest,* which traverse Normandy in every direction, and connect Paris with the towns of Brittany; (4) the *Chemins de fer d'Orléans,* which go to Nantes, Bordeaux, Limoges, Bourges, and Toulouse; (5) the *Chemins de fer de Paris à Lyon et à la Méditerranée,* which connect the valley of the Seine with that of the Rhone, and have branch lines to St. Étienne, Clermont-Ferrand, Grenoble, Toulon, Cette, etc., establishing regular and direct communication between France and Switzerland —the railways of Savoy being also worked by the same company. Paris is the starting point and the administrative centre of all these lines. Another great line worked by the *Compagnie du Midi,* starts from Bordeaux, which it connects with Cette and Bayonne, with branches between Bayonne, Toulouse, and Foix, Agen and Tarbes, Toulouse and Auch, Montpellier and Milhau, etc. Through this line Spain is brought into communication with France.

The other lines worthy of mention are—the railways of the Charentes, connecting La Roche-sur-Yon, La Rochelle, Rochefort, Coutras, Angoulême, Saintes, Limoges, and St. Jean d'Angély; the line from Chauny to St. Gobain; the railway of the docks of St. Ouen, Paris; the line from Dunkirk to Fumay (Belgian frontier); those from Épinay to Velars, from Béthune to Lille, from Somain to Anzin and the Belgian territory, from Vitré to Fougères, and from Perpignan to Prades; the Médoc railway; the Vendée railways; and the *Chemin de fer de ceinture,* which encircles Paris.

The capital required for the making of these railways has been calculated at not less than 10,000,000,000 francs—which gives, for a total length of 21,987 kilometres (13,662 miles), an average of 297,000 francs per kilometre, or £19,118 per English mile. The state has granted and still grants large sums to the companies; but in return they are subject to a tax in proportion to their traffic, as well as to other dues, which are a considerable source of revenue to the public treasury, the profit realized by it having been 55,912,330 francs in 1873. The yearly returns of the companies show an average income of 840 millions of francs.

Navigable rivers and canals.

All navigable rivers are state property. A table is subjoined of the navigable rivers arranged by basins, with the length of their navigable course, and also of the canals and the small rivers which have been converted into canals. Owing to the cheap rate of transport by water, canal traffic has been but little injured by the extension of railways, this inexpensive way of conveyance being used for heavy goods

Navigable Rivers.

	Kilometres.	Miles.
ADOUR	125	78
Midouze	43	27
Nive	20	12½
Gave de Pau	9	5½
CHARENTE	190	118
Boutonne	31	20
Sèvre-Niortaise	71	44½
Vendée	25	16
GIRONDE.		
Baïse	87	54½
Dordogne	393	244½
Garonne	396	246½
Isle	143	89
Lot	276	172
Tarn	147	91½
Vezère	59	37
LOIRE	822	511
Acheneau	23	14
Allier	247	154
Cher	94	58½
Creuse	16	10
Layon	60	37½
Loir	116	72
Mayenne	134	83
Oudon	19	12
Sarthe	132	82
LOIRE *continued*—		
Sèvre-Nantaise	20	12½
Thouet	11	7
Vienne	75	47
MEUSE	231	143½
MOSELLE	173	108
Meurthe	12	7½
ORNE.		
Touques	45	28
RHÔNE	546	339½
Ain	91	56½
Doubs	237	141
Isère	158	99
Petit-Rhône	57	35½
Saône	324	201
Seille	39	24½
SEINE	459	285½
Aisne	59	37
Aube	45	28
Eure	14	9
Grand-Morin	16	10
Marne	353	219
Oise	55	34
Yonne	118	73½
VILAINE	144	89½
	6960	4326

Canals.

	Kilometres.	Miles.
From Aire to La Basée	43	27
From the Aisne to the Marne	58	36
Ardennes	106	66
From Arles to Bouc	47	29¼
From Bergues to Dunkirk	8	5
Berry	322	200
Blavet	60	37
Bourbourg	21	13
Bourgogne	242	150¼
Briare	59	37
Calaisis	41	25½
Centre	116	72
From the Charente to the Seudre	32	20
Colme	38	23½
Deule	65	40½
Est	24	15
Etangs	43	27
Hazebrouck	25	16
Ille-et-Rance	84	52
Latéral à l'Aisne	46	28½
Latéral à la Loire	207	128½
Latéral à la Marne	67	41½
Latéral à l'Oise	29	18
Loing	50	31
Manicamp	5	3
From Marans to La Rochelle	24	15
From the Marne to the Rhine	215	134
Haute-Marne	39	24½
From Mons to Condé	5	3
From Nantes to Brest	360	223½
Neuffossé	18	11¼
Nivernais	174	108
Orléans	74	46
From the Rhone to the Rhine	190	118
From Roanne to Digoin	56	35
St. Quentin	97	60¼
Haute-Seine	44	27¼
Sensée	25	16
Somme	156	97
	3315	2060

Rivers converted into Canals.

	Kilometres.	Miles.
Aa	29	18
Escaut	63	39
Leyre	18	11¼
Lys	53	33
Part of the Oise	105	65¼
Scarpe	31	19¼
	299	185¾

whenever practicable. In 1875, 1,721,070,943 kilometric tons (about 1,748,500,000 tons avoirdupois) were carried by river and canal navigation, besides 176,551,434 cubic metres (230,933,000 cubic yards) of wood or *bois flotté*. The duties levied on these goods amounted to more than 4,177,940 francs.

Harbors.

France is but very inadequately provided with harbors; her long tract of coast washed by the Atlantic and the Bay of Biscay has scarcely three or four good seaports, and those on the southern shore of the channel form a striking contrast to the spacious maritime inlets on the English side. To begin from the north-east, Dunkirk has a small harbor, enlarged, however, by docks, and approached in the Dutch manner by a canal leading from the sea. Calais, one of the best ports on the coast, is not to be compared with Dover. Boulogne has a roadstead, which has been of late greatly deepened and improved. The port of Dieppe is exposed, and of course unsuitable for winter. The best mercantile harbor in the north of France, Le Havre-de-Grâce, at the mouth of the Seine, has large basins and docks, formed at a very great expense. Cherbourg is now a port and arsenal of great utility and importance to the navy; its roadstead, extensive but open, has a sea-wall, affording protection from the swell of the sea; and its spacious dock, excavated since the beginning of this century, at an expense of £3,000,000 sterling, is capable of containing fifty sail of the line. St. Malo, on the north coast of Brittany, possesses a good and large harbor, with quays extending to a length of 2955 metres (3231 yards); its entrance is protected by fortified islets. Brittany also possesses Brest, the great maritime port of the Atlantic for the navy, and, in the south-west, Lorient. Proceeding further to the south, we find Nantes, with its two ports at the mouth of the Loire, Paimbœuf and St. Nazaire; Les Sables d'Olonne, now connected with Liverpool by a regular service of steamers; Rochefort, on the Charente, one of the great dockyards and naval stations; La Rochelle, a small but secure harbor; and Bordeaux, where the Gironde is nearly equal in width to the Thames at London. From this there is no seaport worthy of mention until we reach Bayonne, a place of difficult access. On the Mediterranean, France has the ports of Cette, Marseilles (the most spacious and secure on the coast), Nice, and the great maritime port, arsenal, and dockyard of Toulon.

XI. *Agriculture.*

Agricultural population.

The rural population of France is equal to about a half of the total number of the inhabitants. The census of 1872 gave a return of 18,513,325, or 52·71 per cent. of the whole population. That number was divided thus:—

Landowners living on their estates	9,097,758
Farmers and tenants	4,570,068
Gardeners and nurserymen	378,827
Woodcutters and charcoal burners	270,743
Servants	940,311
Day laborers	3,255,618

Progress in agriculture.

In the general description of the country, some information has been given as to the nature of the soil and its various kinds of produce, which must be supplemented here. The extent of agricultural improvement in France since the first Revolution has certainly been less than in England and Scotland, and it has been repeatedly said that this inferiority had its chief cause in the insignificant size of the occupancies, a feature of French agriculture which Arthur Young observed in his time, but which has been much increased by the law obliging a father to make an almost equal division of his property amongst his children. It would be perhaps nearer the truth to say that generally the more fertile a country is the less care the inhabitants take to cultivate it; if we add to this the influence of the climate, which makes country people more frugal, and at the same time more indolent, we shall be able to account for the difference in the state of agriculture as between the northern and the southern provinces of France. It does not appear, however, that land thus divided produces less in proportion than large estates, and, notwithstanding the great progress that France has still to make, it is in an agricultural point of view as rich as any other country.

Average land value and rent.

The *Statistique Officielle* gives a statement of the average value of land per hectare, and the average rent paid for it, distinguishing in each case three classes of land, thus:—(1) Lands under tillage: value, 3066, 2175, 1355 francs; rent, 96, 69, 45 francs; (2) meadows: value, 4151, 3958, 2022 francs; rent, 152, 104, 72 francs; (3) vineyards: value, 3564, 2638, 1783 francs; rent, 139, 98, 68 francs.

The value of wood varies from 2877 to 1435 francs for the forests, and from 1081 to 569 francs for copsewoods.

Grain crops.

The cultivation of grain has always been the chief business of French agriculturists. In 1873 about 13,000,000 hectares were under this crop, and in 1875 this had increased to about 15,000,000, distributed thus:—

	Hectares.	Average Crop per Hectare.	Total Produce.
		Hectolitres.	Hectolitres.
Wheat	6,961,419	12·04	83,861,193
Meslin	503,178	12·50	6,287,301
Rye	1,912,601	10·86	20,779,367
Barley	1,118,071	16·75	18,732,827
Oats	3,182,456	21·33	67,891,995
Buckwheat	677,626	14·35	9,722,257
Maize	505,993	14·72	8,918,352
Millet	49,984	12·24	612,031

Wheat sells at prices varying from 20 to 26 francs a hectolitre (46s. 6d. to 60s. 5d. a quarter), and costs the agriculturist about 17 francs 50 centimes (40s. 8d. a quarter). The quantity which is produced in France, large as it is, does not meet the wants of the population, and several millions of hectolitres are every year imported from Russia, Prussia, Roumania, Spain, Italy, Egypt, and America.

The cultivation of meslin and rye is on the decline; wherever the progress of agricultural science had succeeded in making a poor soil more rich and fertile, wheat takes their place, as being better and more profitable.

The area allotted to barley has been much the same for a long period, and is likely to remain so. The same may be said of maize, which is especially cultivated in the east and south-west, and of buckwheat, which in Auvergne and Brittany forms no small part of the food of the inhabitants. Oats are extensively cultivated and yield a good return; this crop was on the increase from 1815 to 1862, but has since been almost stationary.

Other crops.

Potatoes form a very important article, occupying in 1873 1,176,496 hectares (2,907,290 acres), and yielding 120,410,929 hectolitres (331,274,554 bushels).

The other crops are tabulated here with the results they yielded for 1873:—

	Hectares.	Average Crop.	Total.
		Hectolitres.	Hectolitres.
Pease, beans, etc.	322,681	13·74	4,434,107
Chestnuts	482,247	13·68	6,567,381
Colza and other oleaginous plants	214,808	13·34	2,963,441
Olive trees	148,626	...	4,594,010
		Quintals.	Quintals.[1]
Beet	253,335	306	77,435,100
Hops	3,528	14	50,244
Tobacco	14,858	12	172,522
Hemp	95,521	5·28	503,941
Flax	87,671	5·75	503,917
Miscellaneous	10,900	20	319,898

[1] The *quintal mètrique* is 3½ ℔ less than 2 cwt.

Meadows.

Meadows, both natural and artificial, are very numerous in France, and give a higher return than any other kind of land. Artificial meadows, sown with clover or lucerne, have considerably increased in extent, as will be seen from the following comparative table:—

	1842.	1852.	1862.
	Hectares.	Hectares.	Hectares.
Natural meadows	105,103,888	129,290,229	160,095,347
Artificial meadows	47,256,674	84,806,847	103,663,376
Pasturage of various kinds	22,500,000	36,049,858	39,355,398
	174,860,562	250,146,934	303,114,121

Vineyards.

The vineyards cover 4·27 per cent of the surface of France, and are one of the chief sources of its agricultural wealth. They are to be found, more or less, in every district, except in ten northern departments, viz., Calvados, Côtes-du-Nord, Creuse, Finistère, Manche, Nord, Orne, Pas-de-Calais, Seine-Inférieure, and Somme. In 1862, according to statistical documents then published by the Government, the departments in which the vine was most extensively cultivated were—Hérault (162,172 hectares), Charente-Inférieure (157,753), Gironde, (126,220), Charente (100,008), Gers (94,790), Gard (94,200), Dordogne (87,252), Aude (81,869), Var (79,040), Lot-et-Garonne (69,166). The vintage of 1876 gave a total of about 41,846,748 hectolitres (921,033,017 gallons).

Live stock.

The census taken in 1872 gave 2,882,851 as the total number of horses, comprising 400,454 colts, 351,654 stallions of 4 years and upwards, 872,911 geldings, and 1,257,832 mares. The number of mules was 299,129, and of asses 450,625. The returns for the same year gave 10,023,746 head of cattle and 24,707,496 sheep. The goats, particularly numerous in Corsica and some mountainous parts, were 1,791,725. The addition of 2,500,000 beehives, of a total value of about 32,800,000 francs, 58,300,000 poultry of all kinds, and 2,300,000 dogs completes the enumeration in its principal divisions of the live stock of agricultural France.

Ministry of agriculture.

In France the interests of agriculture are entrusted to a special minister. Under him are general inspectors, whose duty it is to visit the different parts of the country, and to report on their respective position and wants. These reports serve to determine the distribution of grants and rewards which the state dispenses every year. In 1869 the sum of money given as relief in cases of fires, cattle disease, and damage caused by storms, frost, or excessive drought, floods, and other accidents, amounted to 2,171,340 francs. As rewards, the state gives premiums to the owners of the best stallions and brood-mares (826,000 francs in 1873); it supports by grants riding schools and establishments for training horses (160,500 francs), gives prizes for racehorses (404,500 francs), and distributes about 1,400,000 francs a year for the creation and maintenance of agricultural societies. The principal object of these societies is the organization of provincial shows of cattle, implements, and agricultural produce, under the name of *comices agricoles.* The Government has, besides, founded institutions that are entirely under its management and belong to the state. Such are the sheep-folds of Haut-Tingry (Pas-de-Calais) and Rambouillet (Seine-et-Oise), the cow-house of Corbon (Calvados) for the breeding of Durham cows only, and the *haras* or stallion stables. These stables, containing together about 1085 horses, and kept at an expense of 1,844,000 francs, are established in 22 central towns, and send stallions every year to 340 stations. Two great banking establishments have been founded in order to help those who are engaged in agricultural business. The one, the *crédit foncier*, grants loans on land securities; these loans amounted for the year 1872 to 45,482,242 francs 60 centimes, divided among 1156 borrowers. The other, the *crédit agricole,* which dates from 1860, discounts bills and lends on personal or other security, but always with the object of promoting the progress of agricultural pursuits. In 1872 this company negotiated bills to the value of 248 millions of francs. It paid the same year a dividend of 15 francs for each 500 francs share. The *crédit foncier*, which is an older institution (1852), paid 35 francs for each share of the same value.

XII. *Manufactures, Mines, and Quarries.*

Textile manufactures.

One of the foremost branches of manufacture in France is that which has for its object the working up of textile materials. The gross amount of its produce is not less than 3,500,000,000 francs a year, and statistics published in 1873 return it as employing 308,481 men, 306,898 women, 69,948 children, 2777 steam-engines, and about 9,500,000 spindles. These figures relate to the period between 1861 and 1865, and are certainly very much less than if the enumeration had been taken more recently.

Linen.

The flax gathered in 1873 weighed 54,874,740 kilogrammes (1,081,276 cwt.), and represented a minimum value of 84 millions of francs; to which must be added 10,188,721 kilogrammes (200,766 cwt.) of hemp, at an average price of one franc a kilogramme. About 800,000 spindles are kept busy with this material. In this branch of trade the department of Nord ranks first; it manufactures more than one-third of the total amount of linen produced. Seine, Sarthe, Maine-et-Loire, Seine Inférieure, Calvados, Ille-et-Vilaine, Lot-et-Garonne, Indre-et-Loire, and Seine-et-Oise are, next to the department of Nord, the chief seats of this industry.

Cotton.

The cotton manufacture has its centre in Normandy. More than a third of the total produce of the French cotton looms comes from the department of Seine-Inférieure; Nord, Vosges, Calvados, Aisne, Aube, Orne, Meuse, and Eure have also a large share in the production of cotton yarn and cotton cloth. The department of Rhône is famous for its cotton muslins, the value of which is not less than 28 millions of francs. Meurthe produces a special kind of trimming, valued at about 3 millions of francs a year. French cotton goods cannot cope in cheapness with the English, but they are of fine quality, and on this account command a sale in the markets. In the absence of authentic documents, we may safely estimate the produce of cotton manufacture for 1872 at 500 millions of francs, and the plant engaged in the trade at 6 millions of spindles and 260 millions of looms of various kinds. The loss of Alsace has been a heavy blow to the cotton trade of France.

Woollen.

In the woollen factories 3,200,000 spindles are employed, giving work to more than 172,000 people. Wool fabrics amount in value to 1,200,000,000 francs, figures which present a striking contrast to the valuation of Count Chaptal in 1812, which was not above 250 millions of francs. Large manufacturing houses are to be found especially in the departments of Ardennes (Sedan), Nord (Lille, Cambrai, etc.), Marne, Eure (Louviers), Hérault; while Rhône is noted for shawls, Bouches-du-Rhône for washing and combing, Calvados for wool yarns, Aisne for both yarns and tissues, Aude for drapery, etc. The special manufacture of Paris is that of shawls, damasks for furniture, merinos, and lighter fabrics as gauzes, muslins, bareges, etc.

Silk.

The rearing of silk-worms and the production of silk can be traced far back in the industrial history of France. The first Avignon pope, Clement V., is said to have introduced the first silk-worms and the first mulberry trees (1305). This branch of industry soon assumed a national character, and all kings who, like Louis XI. and Henry IV., cared for the progress of commerce and manufactures, gave it encouragement and privileges. In 1780 France produced 6,600,000 kilogrammes of cocoons (14,549,194℔), having a value of 15,500,000 francs. The following table shows the progress made in the rearing of silk-worms from that date:—

Years.	Weight of Cocoons.		Value.
	Kilogrammes.	Cwt.	Francs.
1781–88	6,200,000	122,167	18,600,000
1789–1800	3,000,000	59,113	9,800,000
1801–1807	4,200,000	82,761	13,600,000
1808–12	5,147,800	101,436	17,502,550
1813–20	5,200,000	102,463	21,520,000
1821–30	10,800,000	212,808	44,080,000
1831–40	11,537,000	227,132	42,840,000
1841–45	17,500,000	344,631	66,500,000
1846–52	24,254,000	477,911	91,816,000
1853	26,000,000	512,335	117,000,000
1863	9,578,804	188,745	51,916,837
1867	14,082,942	277,496	98,580,515
1869	8,076,545	159,144	60,170,260
1872	9,871,116	194,505	60,707,363

These 9,871,116 kilogrammes of cocoons gave 636,800 kilogrammes (12,547 cwt.) of raw silk. Twenty-one departments are engaged in the rearing of silk-worms,—those which yield the largest produce being Gard, Drôme, Ardèche, Vaucluse, Bouches-du Rhône, Var, Isère, Hérault, Basses-Alpes, etc. After having undergone the various operations which transform the cocoon into regular yarn, the silk goes to the weaver. Nine-tenths of the silk is woven at Lyons, by 120,000 looms, belonging to 400 firms, with nearly 800,000 workers, who every year produce silk goods to a value of about 460 millions of francs.

Lace and embroidery.

The manufacture of lace gives employment to 240,000 women at Alençon, Bailleul (Valenciennes), Lille, Chantilly, Caen and Bayeux, Mirecourt, Le Puy, and Paris; and there are 150,000 embroiderers spread over Paris, Lyons, Nancy, Épinal, Tours, Mirecourt, Lunéville, Plombières, St. Mihiel, St. Dié, Alençon, Tarare, Caen, Le Puy, Lille, Cambrai, St. Quentin, etc. The two industries contribute to the public wealth about 90 millions of francs every year.

Hosiery.

Cotton hosiery has its central point in the department of the Aube, wool in Picardy, and silk at Nîmes, Lyons, and Paris; the last also manufactures nearly the whole produce of France in linen hosiery. The annual value of this branch of industry may be stated approximately at 200 millions of francs.

Shoemaking.

The number of shoemakers is above 83,000, and they employ about 120,000 workmen and assistants. Shoes of cloth (*chaussons*) are made by 819 firms, employing 5200 workmen and assistants; and wooden shoes, an important branch of the business, are made chiefly in the departments of Cantal, Orne, Sarthe, Vosges, Vaucluse, and Puy-de-Dôme, and in Brittany, by 34,700 makers, assisted by 77,500 workmen. It has been calculated that this article has a value of about 530 millions of francs. Paris, Grenoble, Lunéville, Vendôme, Blois, Béziers, Annonay, and Niort are the chief seats of the manufacture of gloves, which represents a sum of about 70 millions of francs.

Gloves.

Other clothing.

Hats and caps are made every year to the value of 50 millions, by 6200 houses, employing about 24,000 workmen. Millinery, chiefly made in Paris, gives work to about 4000 persons, most of whom are women. It may be valued at 25 millions of francs. Tailors, and outfitters of all kinds number about 74,000, and give work to 82,000 workmen, seamstresses, and shop-assistants.

Beet sugar.

Beet sugar is extensively made in the north of France. The manufacture of this sugar in a raw state was thus distributed for the year 1876:—

	Kilogrammès.	Cwt.
Aisne	92,721,965	1,827,034
Nord	111,114,778	2,189,454
Oise	41,367,892	815,131
Pas-de-Calais	60,102,110	1,184,278
Somme	67,747,541	1,334,927
Other departments	75,817,002	1,493,931

These quantities are produced by about 510 manufactories. Ninety establishments are especially engaged in refining the first produce extracted from beetroot, or from the sugar cane; about 180,000 tons of raw sugar are received annually from the colonies, French and foreign, by these refining establishments, which employ 3400 workers. The yearly value of the manufacture amounts to 140 millions of francs.

Liquors.

Wine, treacle, and the juice of the beetroot are the substances from which the largest quantity of the alcohol produced in France is extracted. About 3500 firms are engaged in distillation; the produce for the year 1875–76 was divided thus:—

			Hectolitres.	Gallons.
Alcohol distilled from		wine	415,967	9,155,295
"	"	corn and potatoes	97,467	2,145,217
"	"	beetroot	315,024	6,933,572
"	"	treacle	681,734	15,004,739
"	"	other substances	48,017	1,056,838
			1,558,209	34,295,661

To this 429,648 hectolitres (9,456,409 gallons) are to be added, distilled by small proprietors who do not manufacture much more than for their own consumption, and are known by the name of *bouilleurs de cru.* Normandy and Brittany are the chief centres for the production of cider. In 1876 about 7,035,669 hectolitres (154,845,539 gallons) were manufactured. There are about 3200 brewers, who send out not less than 7,400,000 hectolitres of beer (162,871,543 gallons), worth about 200 millions of francs; but, as hops are but little cultivated in France, 3 millions of francs are spent yearly in importing them. The largest manufactories of vinegar are in the departments of Loiret and Loire-Inférieure; it is made almost exclusively from wine, but malt and some other substances are now beginning to be used. The total value is about 3 millions of francs.

Tanning.

The dressing and tanning of hides and skins have greatly increased of late years; they now represent a sum of 400 millions of francs, or about a million of francs more than in 1852.

Soap.

The principal soap manufactories are at Marseilles, its production being 800,000 quintals (1,576,354 cwt.); Nantes and Paris hold the second rank. It has been calculated that France produces annually 2 millions of quintals (3,940,886 cwt.) of soap. Candles are chiefly made at Paris. This branch of manufacture has a total value of 300 millions of francs, whilst the production of soap amounts to 450 millions. French perfumery is appreciated through the world, and gives a yearly return of more than 50 millions of francs.

Candles.

Perfumery.

Pottery and glass.

The departments of Vienne, Seine, Sarthe, and Puy-de-Dôme are the centres of the fabrication of earthenware and bricks; in Haute-Vienne, Var, and Gironde the special manufacture is china. In 1847 official statistics valued at 85,964,000 francs the total produce of that industry; but this value has certainly more than doubled since. A great manufactory kept up by the state at Sèvres forms a school in which artistic workmen are trained, so that the art is maintained in a high degree of perfection. Crystal wares are made in eight works, established in the departments of the Meurthe-et-Moselle, Seine, and Orne, among which special mention must be made of Baccarat, which is to this branch of industry what Sèvres is to the ceramic. Looking-glasses are a very important article of manufacture in France,—that country possessing no fewer than 6 out of the 15 or 16 establishments in Europe. The principal manufactory is at St. Gobain (Aisne), and the value of the produce of the whole is above 14 millions of francs. Glass of a more common kind is made in about 250 establishments, and is valued at 80 millions of francs. The departments of Nord, Haute-Saône, Haute-Loire, Allier, Seine-Inférieure, Seine, Aveyron, and Loire are famed for common window and plate glass; bottles are chiefly manufactured in the department of Nord, and in the basins of the Loire and Rhône; the most ancient works established for this manufacture are at Quiquengrogne (Aisne), and date as far back as 1291.

Paper.

The most important paper-mills are situated in Charente, Pas-de-Calais, Seine-et-Oise, Isère, Vosges, Seine-Inférieure, Seine, Eure, and Seine-et-Marne. Paris is celebrated for its paper-hangings and stained papers. In 1856 Moreau de Jonnès valued the produce of this manufacture at 55 millions of francs. Notwithstanding the special taxes now levied on it, this amount has undoubtedly increased by a large sum.

Books and prints.

In the period between the 1st November, 1811, and the 31st December, 1872, 603,849 works have been published in France, subdivided thus:—

Books and pamphlets in all languages	463,617
Engravings, maps, and plans	85,787
Musical publications	54,445

In 1872 the number of publications of all kinds was 15,744, 3614 of which were musical works, and 1571 engravings, maps, or plans. Proprietors of political newspapers must deposit with the treasury a guarantee that they will pay the fines to which the press law often renders them liable; security to the amount of 24,000 francs is required in the department of Seine, and 12,000 francs in the others. If the paper appears only once or twice a week, the security required is only 18,000 francs in the department of Seine and 6000 in the rest of France. The paper on which political newspapers are printed is charged besides with a tax of 20 francs per 100 kilogrammes (about 8s. 1½d. per cwt.). Notwithstanding this 854 political newspapers, 210 of which were daily, were published in France (54 of them in Paris) in 1873. Non-political periodicals were not fewer than 1220, to which number Paris contributed 718, divided thus:—religious, 81; educational, 21; legal, 42; administration, 18; political economy, insurance, and commerce, 40; stock-exchange interests, 39; medical, 54; natural philosophy, 45; agricultural, 37; military and naval, 23; history and geography, 17; fine arts and architecture, 49; literary and critical, 56; fashion and the amusement of the young, 84; archæological, 14; public works, 26; technology and popular science, 50.

The printing and bookselling trades are carried on by about 7000 persons, who may be classed as follows:—

	Paris.	Departments.	Total.
Printers	88	944	1032
Printers and lithographers	549	911	1460
Copper-plate printers	67	61	128
Booksellers	1034	3354	4388
	1738	5270	7008

Coal.

The principal mines which France possesses are coal and iron mines. Coal-pits are almost exclusively confined to the east, south-east, and north of the country. The richest departments are Nord (239 square miles), Pas-de-Calais (201), Gard (187), Saône-et-Loire (165), Hérault (113), Loire (110), and Bouches-du-Rhône (107). The whole area is about 2200 square miles, and comprises 623 separate *concessions*, which, however, are not all being worked. The yield of coal mines in 1876 was 170,477,613 quintals (16,795,824 tons), the following being the most productive districts:—

Names of the Basins.	Departments.	Quintals.
Valenciennes	Nord, Pas de Calais	65,332,909
Loire	Loire, Rhône	34,717,183
Alais	Ardèche, Gard	16,448,387
Creuzot; Blanzy	Saône-et-Loire	9,905,876
Commentry	Allier	9,219,227
Aubin	Aveyron	7,046,129
Aix	Bouches-du-Rhône, Var	3,545,100
Graissessac	Hérault	2,757,831
Carmaux	Tarn	2,571,700
Ahun	Creuse	2,150,828
Brassac	Haute-Loire, Puy-de-Dôme	2,020,896
Ronchamp	Haute-Saône	1,998,332
St. Eloy	Puy-de-Dôme	1,772,765
Decize	Nièvre	1,626,430
Epinac	Saône-et-Loire	1,490,170
Le Maine	Mayenne, Sarthe	1,190,680
Le Drac	Isère	1,086,520
Hardinghem	Pas-de-Calais	942,734
Basse-Loire	Loire-Inférieure, Maine-et-Loire	680,293
Vouvant, Chantonnay	Deux-Sèvres, Vendée	445,819
Buxière-la-Grue	Allier	437,282
Manosque	Basses-Alpes, Vaucluse	388,054
Bert	Allier	358,145
Sainte-Foy-l'Argentière	Rhône	332,103
Maurienne - Tarentaise, Briançon	Hautes-Alpes, Savoie	299,690

Peat.

Peat is to be found in 40 departments, but especially in Somme, Pas-de-Calais, Loire-Inférieure, Isère, Oise, Seine-et-Oise, Aisne, Nord, Doubs, Marne, Vosges, and Aube. The cutting of this fuel, so useful to the poorer classes, gives work to from 30,000 to 40,000 men, whose wages amount to a total of about 4 millions of francs. The mines of mineral tar yield about 3 millions of quintals (295,566 tons) annually. Saône-et-Loire, Allier, and Ardèche are the principal centres of its production.

Iron.

France is very rich in iron mines; but as these are generally far from the districts which produce coal, the working expenses are considerably increased, and sometimes to such an extent that the metal extracted cannot repay the outlay required for its extraction, and the mines have to be abandoned. The production of iron, however, is on the increase, and reaches 7½ millions of quintals (738,915 tons), which represent about 14,500,000 quintals (1,428,571 tons) of pig-iron. The details in quintals of this production for 1876 are appended:—

Departments.	Pig-Iron.	Iron.	Departments.	Pig-Iron.	Iron.
Allier	947,730	247,990	Marne	29,226	
Ardèche	808,597		Haute-Marne	841,193	822,026
Ardennes	142,700	348,650	Mayenne	20,553	130
Ariége	209,195	87,550	Meurthe-et-Moselle	3,267,959	568,393
Aube	1,200	69,906	Meuse	176,150	125,000
Aveyron	297,240	368,250	Morbihan	25,350	
Bouches-du-Rhône	225,000	13,100	Nièvre	....	203,137
Charente	......	6,750	Nord	1,486,525	1,778,343
Cher	351,185	34 596	Oise	....	166,653
Corse	48,000	12,000	Orne	....	1,900
Côte-d'Or	110,200	150,450	Pas-de-Calais	602,390	6,000
Côtes-du-Nord	14,750	25,006	Basses-Pyrénées	....	4,432
Dordogne	54,900	44,823	Pyrénées-Orientales	79,074	
Doubs	30,677	32,412	Haut-Rhin (Belfort)	....	11,313
Eure	43,520		Rhône	697,737	
Finistère	......	4,767	Haute-Saône	128,735	20,570
Gard	854,868	255,878	Saône-et-Loire	1,506,927	509,925
Haute-Garonne	......	17,000	Sarthe	8,422	1,412
Gironde	55,000	9,442	Savoie	2,550	1,255
Ille-et-Vilaine	19,790	1,550	Haute-Savoie	....	7,960
Indre	39,970	16,925	Seine	....	240,400
Isère	220 369	73,145	Seine-Inférieure	....	6,040
Jura	297,310	167,159	Seine-et-Oise	....	25,085
Landes	152,135	25,566	Somme	....	8,300
Loir-et-Cher	......	2,350	Tarn	....	7,264
Loire	467,895	569,901	Tarn-et-Garonne	53,500	49,750
Loire-Inférieure	85,660	66,500	Vienne	....	1,600
Lot-et-Garonne	128,000		Vosges	......	17,075
			Yonne	....	96,806
				14,495,377	7,332,716

In some iron-works, especially those which are established in the chain of the Pyrenees, wood is still used as fuel; 185,024 quintals (18,266 tons) of iron were made by this process in 1876. The production of steel was for the same year 2,618,767 quintals (258,006 tons), the largest part of which came from the departments of Loire, Saône-et-Loire, Gard, Allier, Nord, and Rhône.

Other metals.

In 1864 there were 64 mines from which other metals than iron were extracted, viz., 39 of silver ore (*galène argentifère* and *alquifoux*) in the departments of Hautes-Alpes, Finistère, Gard, Haute-Garonne, Ille-et-Vilaine, Isère, Loire, Haute-Loire, Lozère, and Puy-de-Dôme; 12 of copper (Rhône and Vosges); 8 of antimony (Cantal, Haute-Loire, Lozère, Puy-de-Dôme); 4 of manganese, and 1 of nickel. There were 5066 men employed in working these mines, which gave a return of 4,955,515 francs. But these statistics cannot be relied on, except for the year of their publication, as old mines are constantly closed and new ones opened. In 1869, for example, there is no mention of silver mines, and the mines of manganese are 9 in number instead of 4 as given above.

Quarries.

The quarries of France are about 24,000 in number, giving employment to more than 88,000 men. The last valuation of the produce was made in 1846, and amounted to 41,047,519 francs, but it must be much higher now. Marble is abundant, especially in the departments of Pyrénées, Bouches-du-Rhône, Puy-de-Dôme, Hérault, Hautes-Alpes, Corse, Ariége, etc. Alabaster is found in the departments of the Yonne, in the valley of Aspe (Pyrénées), at Lagny (Seine-et-Marne), and at Montmartre (Paris). Lithographic stones are common in the departments of Ain, Indre, and Côte-d'Or. Slates are principally extracted from the quarries of Cherbourg and St. Lô (Manche), Angers (Maine-et-Loire), and Fumay (Ardennes). Limestone is abundant in 50 departments, and 38 yield plaster.

Gold and silver work.

Paris is the chief centre of the manufacture of artistic objects in gold or silver; in 1860 the workmen were 18,731 in number, distributed among 3199 establishments, and the business was transacted to the value of not far from 184 millions of francs. Lyons holds the second place, and then Bordeaux, Marseilles, Nîmes, Besançon, Clermont-Ferrand, and Toulouse. The gross value of the various metals used by the trade at the same period was calculated at 52,625,000 francs, silver forming about a third of the whole.

Watches and clocks. The manufacture of watches and clocks yields a revenue of 30 millions of francs. Large iron clocks are made at Morez (Jura); time-pieces are constructed in part at St. Nicolas d'Aliermont (Seine-Inférieure) and at Montbéliard, and finished at Paris; watches are begun at Montbéliard and Cluses (Haute-Savoie), and finished at Paris and Besançon. This last town is the central place of the trade, and represents 99½ per cent. of the total manufacture; 15,000 persons, men, women, and children, are employed in this trade, and in 1872 they turned out 135,276 gold and 259,626 silver watches.

XIII. *Commerce and Banking Establishments.*

Inland trade. Commerce is naturally divided into home and foreign trade, the former being greatly more important than the latter. It is impossible to give a strict and correct valuation of the inland traffic, but, judging of the whole from the few accessible details, we may, without exaggeration estimate its amount at about 35 or 40 thousand millions of francs. The gross weight of goods conveyed through the canals and navigable rivers has been given above (p. 458); these goods principally consist of coals, wood, stones, metals, wines, corn, and other heavy materials. This mode of conveyance is slow, but cheap, the duty levied varying from 1 to 5 centimes per 1000 kilogrammes per kilometre, *i. e.*, the maximum rate is about $\frac{3}{4}$d. a ton per mile.

The administration of public works published in 1867 a table of the traffic on French railways by goods trains, from which the following is an extract:—

	Metric Tons.		Metric Tons.
Flour and corn	3,233,369	Manures	521,932
Wine, spirits, and vinegar	2,670,424	Coals	11,638,662
Grocery and provisions	1,836,678	Carriages	11,724
Metals	3,298,317	Horses	218,504
Building materials	5,242,354	Cattle	5,929,667
		Miscellaneous	10,124,766

In 1869 the total weight of goods conveyed by *petite vitesse* (goods trains) was 44,013,433 metric tons.[1] Since that time a considerable increase has evidently taken place, the consequence at once of the general progress of commerce and of the great extension of railways.

Coasting trade. The coasting trade has always been of great importance in France, though it is far inferior to that of England. In 1875 the total weight of goods transported by coasters was 2,022,559 tons, an increase of nearly 7000 tons on the preceding year. These goods were of various kinds,—building materials (258,174 tons), wines (225,595 tons), salt (213,185 tons), wood (207,211 tons), corn and flour (199,461 tons), coals (125,243 tons), being the chief articles in the general traffic. 62,396 vessels, the tonnage of which amounted to 3,207,933 tons, were engaged in this trade, while in 1874 there were only 57,888, of 2,952,414 tons. The harbors most frequented by coasters are Marseilles, Le Havre, Bordeaux, Dunkirk, Rouen, Cettes, Dieppe, Nantes, St. Nazaire, and Boulogne.

Fisheries. The annual produce of river and pond fishing in the interior of France may be valued at about 10 millions of francs. Coast fishing was carried on in 1871 by 8995 boats, manned by 38,150 men, with a tonnage of 68,517 tons, giving a return of 51,609,200 francs. In 1875 the increase was considerable, the number of the boats being 20,159, the tonnage 101,852 tons, the crews 68,651 hands, and the revenue 61,780,160 francs. The same year 178 vessels, with a tonnage of 30,295 tons, and manned by 7800 men, sailed from French ports to fish for cod on the coasts of Newfoundland; the year before the number of the boats engaged in cod fishing was 188. The average value of the Newfoundland fisheries is estimated at about 17 millions of francs. The rearing of oysters has of late made very great progress in France. Large beds are established on almost every suitable point of the coast, as at Cancale, Auray, Marennes, Oléron, and Arcachon. The last-named place is the most important of all, the beds being not fewer than 2427, which gave for 1876 a return of 3,941,309 francs, represented by 196,885,450 oysters, 4,700,000 of which were shipped to England.

Octroi. In 1510 towns a duty is levied on goods, especially upon provisions and liquors, brought to market for public sale, or disposed of privately. In 1871 the total revenue yielded by this tax, which is known by the name of "*octroi,*" was 156,490,935 francs, divided as follows:—

	Francs.		Francs.
Wines	48,427,924	Fuel	17,704,919
Cider	2,771,743	Fodder	7,906,196
Spirits	8,997,298	Building materials	7,891,322
Other drinks	15,624,090	Miscellaneous	5,319,968
Provisions	41,847,475		

The following table shows the returns of the octroi tax, in the towns where it yielded more than 1 million of francs for the years 1874 and 1876:—

	1874. Francs.	1876. Francs.
Paris	98,896,890	124,238,118
Lyons	8,570,618	11,138,497
Marseilles	6,228,699	9,782,279
Bordeaux	3,670,979	4,267,331
Lille	2,971,308	1,317,053
Nantes	2,041,361	2,309,377
Toulouse	2,471,514	2,904,121
Rouen	2,883,526	3,499,820
Le Havre	2,309,623	2,484,347
St. Étienne	2,269,951	2,847,545
Rheims	1,002,037	1,072,340
Roubaix	1,138,525	1,350,249
Nîmes	996,914	1,095,857
Amiens	957,925	1,107,082
Angers	870,540	1,096,869
Nancy	1,095,856	1,363,654
Limoges	958,555	1,140,029
Toulon	1,076,139	1,207,100
Nice	1,087,901	1,277,581
Rennes	1,004,110	1,148,469
Tours	778,876	1,023,582
Versailles	1,089,532	1,146,738
Grenoble	896,999	1,049,734

This tax is far from being uniform, the percentage in some places, as Paris, being as low as 4·76 francs for every 100 inhabitants, and in some others, as high as 13·55 (Amiens), 14·15 (Rouen), 14·98 (Bordeaux), and 15·56 (Versailles). It is fixed by a decision of the municipal council, subject to the sanction of the legislative chambers. If the average of the tax be reckoned at 10 per cent. of the value of the goods liable to it, the returns would show that such goods have a value of about 16 millions of francs, not including, of course, the considerable trade which is carried on in places where no octroi has been yet established.

Foreign trade. Although the principles of free trade are now better understood in France than they were formerly, and are generally considered by French economists and statesmen as most conducive to the interests of a nation, their application is still far from complete, owing to the enormous charges brought upon the country by the late war, but chiefly to the personal influence of M. Thiers, the first president of the republic, who was a determined upholder of protection. This is not the place to enter on any discussion of the merits of the two opposite doctrines; but the fact does not admit of question, that notwithstanding the tax on raw materials and other duties which hamper the commercial intercourse of France with other nations, her foreign trade has been constantly increasing. The imports amounted in 1875 to 3,537,000,000 francs, and the exports to 3,872,000,000 francs (goods in transit not being included in these numbers), which is an increase of 24 millions for imported and 171 millions for exported goods over the year 1874. In 1869 the value of the imports was 3,153,100 francs, and that of the exports 3,074,900 francs. Foreign goods weighing 1,988,770 quintals (195,938 tons) entered and left France in transit during the course of 1875, showing a decrease of 318,745 quintals as compared with 1874. The principal articles of this class are silk goods (value 137 millions of francs), cottons, woollens, jewelry, gold and silver plate, mats, manufactured leather, corn, coffee, etc. The commercial transactions of France with foreign countries and her own colonies are shown in the following table, the returns being those of 1875:—

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[1] The ton here and in what follows (as well as in the table) is the French metric ton of 10 quintals, which is about 33 ℔ less than the English ton,—the latter in commerce being held equivalent to 1015 kilogrammes.

IMPORTS.

Countries.	Value. Francs.
England	624,300,000
Belgium	439,200,000
Germany	349,000,000
Italy	322,500,000
Russia	196,500,000
United States	190,200,000
British India	129,500,000
Turkey	122,500,000
Algeria	108,600,000
Spain	94,100,000
Switzerland	93,700,000
Argentine Republic	90.000,000
China	88,600,000
Austria	57,900,000
Peru	51,600,000
Brazil	50,500,000
Sweden	45,700.000
Haïti	40,700,000
Uruguay	39,700,000
Spanish America	37,600,000
Egypt	36,500,000
Holland	33,200,000
West Coast of Africa	32,500,000
Martinique	24,900,000
Barbary States	24,700,000
St. Pierre & Miquelon	24,300,000
Norway	21,600,000
Island of Réunion	20,000,000
Guadeloupe	17,800,000
Japan	15,900,000
Chili	14,000,000
Venezuela	12,800,000
New Granada	9,900,000
Senegal	9,600,000
Mexico	9,100,000
Dutch Indies	8,900,000
Portugal	8,000,000
French colonies in India	7,800,000
Africa	6,000,000
Greece	5,800,000
English colonies in Africa	5,300,000
English possessions in Mediterranean	2,300,000
British America	2,100,000
Cochin-China	1,900,000
Siam	1,700,000
Mayotte, Nossi-Bé, etc	1,700,000
Philippine Islands	1,300,000
Guatemala	900,000
Equator	900,000
Dutch colonies in America	400,000
Wrecks and Salvages	400,000
Denmark	300,000
St. Thomas	300,000
French Guiana	300,000
Islands of Oceania	200,000
Bolivia	100,000
Australia	
	3,536,700,000

EXPORTS.

Countries.	Value. Francs.
England	1,067,200,000
Belgium	527,200,000
Germany	426,900,000
Switzerland	315,200,000
United States	264,400,000
Italy	218,700,000
Algeria	146,100,000
Spain	140,600,000
Turkey	75,600,000
Argentine Republic	74,500,000
Brazil	73,200,000
Holland	50,200,000
Russia	47,300,000
Egypt	42,100,000
Chili	31,200,000
Portugal	25,400,000
Peru	23,800,000
Spanish America	22,100,000
Haïti	21,800,000
Austria	21,400,000
New Granada	19,000,000
Greece	17,800,000
Mexico	17,600,000
Martinique	15,400,000
Uruguay	14,100,000
Barbary States	13,700,000
Sweden	13,200,000
Guadeloupe	12,200,000
Japan	11,800,000
St. Thomas	11,200,000
Norway	10,600,000
British America	9,000,000
Island of Réunion	8,300,000
English Indies	8,200,000
West Coast of Africa	8,100,000
Venezuela	7,600,000
Denmark	7,000,000
English colonies in Africa	6,600,000
English possessions in Mediterranean	6,600,000
St. Pierre & Miquelon	6,200,000
French Guiana	5,200,000
Senegal	4,800,000
Cochin-China	4,800,000
Islands of Oceania	3,300,000
Dutch Indies	3,200,000
China	3,200,000
Guatemala	2,300,000
Dutch colonies in America	1,600,000
Equator	1,200,000
Africa	900,000
French colonies in India	900,000
Australia	600,000
Philippine Islands	600,000
Bolivia	400,000
Mayotte, Nossi-Bé, etc	300,000
Siam	200,000
	3,872,600,000

The whole export and import trade, along with the salt tax, brought in the same year to the custom house a return of 267,907,791 francs, divided thus:—

	Francs.
Import duties	228,457,837
Export duties	353,013
Droits de statisque	5,844,999
Navigation duties	4,717,688
Accessory duties	3,985,645
Salt tax	24,907,791

The foreign trade is for a great part carried on by sea. France, however, has a very limited number of trading vessels; and foreign ships, chiefly English, convey about two-thirds of her goods, both imports and exports.

With regard to the nature of the goods, the values of the imports and exports (1875) were as follows:—

IMPORTS.

	Francs.
Silk and floss-silk	330,100,000
Wool	326,500,000
Raw cotton	321,300,000
Hides, skins, and furs	203,300,000
Coals	183,200,000
Common woods	164,100,000
Corn	138,600,000
Cattle	111,600,000
Coffee	105,100,000
Flax	90,500,000
Oleaginous grains	90,500,000
Cotton stuffs	84,400,000
Woollen stuffs	78,100,000
Foreign sugar	58,400,000
French colonial sugar	51,200,000
Cotton yarns	42,600,000
Vegetable oil	42,600,000
Tanned hides	42,200,000
Oleaginous fruits	38,800,000
Silk stuffs	37,200,000
Ores of all kinds	36,500,000
Copper	34,100,000
Engines and machinery	32,400,000
Guano and other manures	29,700,000
Cheese and butter	28,800,000
Fruits for the table	27,800,000
Sea fish	26,600,000
Nitrates of soda and of potash	24,100,000
Straw hats	23,500,000
Greases	22,900,000
Lead	21,800,000
Exotic woods	21,800,000
Tobacco (in leaf)	21,100,000
Indigo	19,500,000
Woollen yarns	18,300,000
Fresh and salt meat	17,900,000
Horses	17,500,000
Zinc	16,400,000
Rice	16,300,000
Mats	15,200,000
Hops	15,200,000
Jute	14,600,000
Iron and steel	14,000,000
Wines	13,800,000
Mineral oils and essences	13,400,000
Hemp	13,300,000
Implements and tools	13,200,000
Paper, books, and engravings	12,600,000
Cocoa	12,500,000
Tin	12,200,000
Flax or hemp yarns	11,200,000
Pease, beans, and pease-meal	8,300,000
Brandies and spirits	7,900,000
Sulphur	7,300,000
Cast-iron	6,700,000
Seeds	6,400,000
Manufactured tobacco	4,100,000
Jewelry, gold and silver plate	3,600,000
Articles made of leather or skin	2,700,000
Saffron	2,500,000
Watches and clocks	2,200,000
Eggs of silk-worms	900,000
Miscellaneous	412,600,000
	3,536,700,000

EXPORTS.

	Francs.
Silk stuffs	376,700,000
Woollen stuffs	346,400,000
Wines	247,500,000
Corn	202,700,000
Mercery, toys, and fancy articles	181,100,000
Manufac. skins	173,300,000
Refined sugar	152,100,000
Silks	133,000,000
Cheese and butter	96,100,000
Tanned hides	89,500,000
Readymade garments	86,100,000
Wools	84,100,000
Cotton stuffs	81,500,000
Horses, mules, cattle	80,700,000
Brandies and spirits	79,500,000
Implem'ts and tools	70,600,000
Jewelry, gold and silver plate	60,500,000
Earthenware, glass, and crystal	60,000,000
Paper and its applications	58,800.000
Raw sugar	53,000,000
Raw cotton	52,000,000
Eggs	46,500,000
Chemicals	45,800,000
Millinery	42,200,000
Common woods	41,400,000
Raw skins and furs	41,100,000
Fruits for the table	39,400,000
Woollen yarns	36,700,000
Linens	35,500,000
Sea fish	30,200,000
Seeds	29,700,000
Engines and machinery	25,000,000
Potatoes, pease, beans	23,900,000
Flax and hemp	19,800,000
Articles bearing "fancy" prices	17,500,000
Watches and clocks	17,400,000
Greases	17,200,000
Oil-cakes	17.000.000
Building materials	16,800,000
Oleaginous fruits and seeds	14,100,000
Rags	13,900,000
Vegetable oil	13,700,000
Weapons	13,300,000
Mus. instruments	13,100,000
Flax or hemp yarns	12,700,000
Hair	11,200,000
Coals	10,700,000
Colors	10,300,000
Drugs	10,100,000
Copper	10,100,000
Felt hats	9,800,000
Iron, cast-iron, steel	9,000,000
Soaps	8,900,000
"Parisian" articles	8,600,000
Candles	8,100,000
Perfumery	7,200,000
Garancine	4,900,000
Ores of all kinds	4,500,000
Salt meat	4,200,000
Cotton yarns	4,100,000
Madder	4,000,000
Saffron	3,200,000
Indigo	2,700,000
Manufac. tobacco	2,400,000
Miscellaneous	349,500,000
	3,872,600,000

Banks.

Besides the two banking companies especially founded with a view to assist agriculture, of which notice has been taken under that heading (*crédit foncier, crédit mobilier*), there are other establishments of credit which partake of the nature of public institutions, and must not be passed over in silence when speaking of French trade. The first of them is the *Banque de France*, founded in the year VII. (1799), and definitely organized by the law of the 26th April, 1806, which gives the management of the bank to a governor and two deputy governors appointed by the chief of the state, and assisted by a council of fifteen *régents* and three *censeurs* elected by the shareholders. The capital of the Bank of France is 182,500,000 francs. Besides issuing bank notes, which circulate as freely as gold, the bank has the power to discount bills and letters of exchange at three months, when endorsed by three signatures; to collect bills payable given to it by private persons or commercial houses for that purpose; to receive deposits and open current accounts; and to keep in trust the coupons, deeds, silver and gold bars, bullion, and jewels which may be entrusted to it, at the rate of one per cent. per annum. The Bank of France has now a branch in each department. In the following towns, Bourg, Cahors, Tarbes, Aurillac, Mende, Tulle, Digne, Belfort, Foix, Gap, Mont-de-Marsan, La Roche-sur-Yon, and Meaux, these branches are not yet open; but the law has been passed, and their being opened is only a question of time. This establishment is the great instrument of credit in the country. It has more than once supported the Government by loans in difficult circumstances. The Government, which holds a great number of its shares, is therefore interested in its preservation, and, when money is unusually scarce, gives to its notes the value and privileges of coin, by decreeing what is called the *cours forcé*. This measure was resorted to during the late war, and confidence in the bank remained unshaken. During the year 1876 the quotation of the shares of the Bank of France fluctuated between 3875 and 3470 francs. Of other banks the *Comptoir d'Escompte*, which dates from 1848 and was reorganized in 1854, the *Société générale de Crédit industriel et commerciel*, founded in 1859 after the model of the London joint stock banks, the *Société générale pour favoriser le développement du Commerce et de l'Industrie en France*, established in 1864, whose special feature is to endeavor to make the use of cheques popular in France, and the *Caisse des Dépôts et Comptes courants*, are also worth mentioning. Among the local banks, the *Crédit Lyonnais*, the Colonial Banks, and the Bank of Algeria may be named, as the most important.

Coinage.

The coining of money is carried on by private contractors under the strict superintendence of the state. There are now in France six *hôtels des monnaies* (mints), in Marseilles, Bordeaux, Lille, Lyons, Paris, and Rouen respectively. Paris is the chief centre, and the other mints hardly now issue anything except copper coins. From 1795 till the 1st January, 1874, the quantity of gold and silver moneys coined in France was as stated below:—

GOLD.[1]

	Value, francs.
Coins of 100 francs	44,346,400
" 50 "	46,568,700
" 40 "	204,432,360
" 20 "	6,273,174,360
" 10 "	965,051,690
" 5 "	210,947,190
	7,744,520,700

SILVER.

	1795–1871.	1872.	1873.
	Value, francs.	Value, francs.	Value, francs.
Coins of 5 francs	4,685,641,250	389,190	154,649,045
" 2 "	70,512,344	7,547,588	1,056,152
" 1 "	86,998,118	15,958,333	19,101
" 0·50 centimes.	40,480,856	2,943,258	545,862
" 0·20 "	2,504,728		
	4,886,137,296	26,838,369	156,270,160
	Total, 5,069,245,825 francs.		

This amount (with 307,232,889 francs value re-coined) is apportioned thus among the different governments which have ruled France during the period specified:—

	Gold.	Silver.	Total.
	Value, francs.	Value, francs.	Value, francs.
First Republic	......	106,237,255	106,237,255
Bonaparte and Napoleon I	528,024,440	887,830,055	1,415,854,495
Louis XVIII	389,333,060	614,830,110	1,004,163,170
Charles X	52,918,920	632,511,320	685,430,240
Louis Philippe	215,912,800	1,756,938,333	1,972,851,133
Second Republic	427,282,860	459,248,282	886,531,142
Louis Bonaparte and Napoleon III	6,151,961,600	626,294,792	6,778,256,392
Third Republic	50,169,880	221,505,707	271,675,587
	7,815,603,560	5,305,395,854	13,120,999,414

Measures and weights.

Measures, Weights, and Money.—The basis of all French measurements is the *mètre*, the length of which is the ten-millionth part of the arc from the pole to the equator. Multiples of this, increasing by tens, are expressed by Greek prefixes (the decametre, hectometre, and kilometre being 10, 100, and 1000 metres respectively), while the subdivisions have Latin prefixes (the decimetre, centimetre, and millimetre being $\frac{1}{10}$, $\frac{1}{100}$, and $\frac{1}{1000}$ of a metre). Similar decimal systems are formed from the other units of measure. The *are* is 100 square metres, and the *litre* the thousandth part of a cubic metre. The *gramme* is the weight of a cubic centimetre of distilled water at 4° C. (its maximum density). The measures in common use are here given, with their English equivalents:—

Lineal Measure	Metre	= 39·3707904 inches.
	Kilometre	= ·6213824 mile.
Square Measure	Hectare	= 2·471143 acres.
	Kilometre carré (100 hectares)	= ·386116 sq. mile.
Capacity	Litre	= 1·7607734 imp. pints.
	Hectolitre	= 22·0096677 gallons.
Weight	Gramme	= 15·43234 grains troy.
	Kilogramme (or kilo).	= 2·20462 ℔ avoird.

In commerce 10 kilos = 22 ℔, but 1015 kilos = 1 ton.

Money.

Money is reckoned by the franc of 100 centimes, in value a little over 9½d. £1 sterling = 25 francs.

XIV. *Colonies.*

Algeria.

Algeria is the most important colonial possession of France. Its extent, between the Mediterranean in the north, Tunis in the east, Morocco in the west, and the Sahara in the south, is about 47,000,000 hectares (181,474 square miles), 4,597,000 hectares of which are peopled by 1,132,414 inhabitants, ruled by the ordinary laws of the mother country. A part of the rest is divided into *douars*, dependent on regularly administered *communes*, 166 in number. This portion extends to 1,511,000 hectares (5834 square miles), with 555,807 inhabitants, 127,321 of whom are French, 32,660 Jews, 113,018 foreigners, and 282,808 Mussulmans. Another portion of the *douars* is administered by French functionaries, either civil or military, assisted by native and European councillors; the territory under civil authorities measures 3,086,000 hectares (11,915 sq. miles), and contains 576,007 inhabitants; 9888 are French or naturalized Jews, 1683 foreigners, and 567,036 Mussulmans. Finally, 32 communes are still directly managed by native chiefs, although their authority is subordinate to that of French officials; the number of inhabitants is 1,219,285, 1747 of whom are French, 93 Jews, 649 foreigners, and 1,216,796 Mussulmans.

The European colonists who have settled in Algeria number about 117,175. They have received from the state (1875) 565,000 hectares (2181 square miles); they have bought from the natives 260,000 hectares (1004 sq. m.), and 130,000 hectares (502 sq. m.) have been conceded to the *Société générale Algérienne* and to the *Société génévoise*. The budget of Algeria in 1876 amounted to about 27 millions of francs, of which two-thirds was devoted to public works or works of general interest. In 1869 the surface of ground under tillage was 1,684,000 hectares (6502 sq. m.), which produced 10,676,500 quintals (1,051,871 tons) of grain. In 1874, 2,950,000 hectares (11,390 sq. m.) gave a harvest of 16,676,290 quintals (1,642,984 tons), more than two millions of which were exported, representing a value of about 40 millions of francs. Vineyards occupied a surface of 11,360 hectares (28,072 acres), without taking into account the plantations made by the natives, and yielded 230,000 hectolitres (5,062,236 gallons) of wine; in 1866 this crop did not give more than 99,000 hectolitres (2,178,957 gallons). The importance of the cultivation of flax has doubled during the last five years, this plant covering now about 9000 hectares (22,240 acres) of ground. The same progress is to be noticed everywhere; thus the last census (1874) showed that there were in Algeria about 4,500,000 head of cattle and 10 millions of sheep, double the numbers returned in 1869. Algeria contains mines of iron, copper, lead, and zinc, which give a produce of about 600,000 metric tons, of a value of 7 millions of francs at least,—that is, a fifth part of the production of those metals in France. Alfa (a plant which gives excellent material for the manufacture of paper) and tobacco are the other products of importance. Alfa was exported in 1874 to the extent of 45,000 metric tons, 72 per cent. of this being sent to England. About 9000 planters are engaged in the cultivation of tobacco, which gave in 1875 a crop of more than 4,300,000 kilogrammes (84,629 cwt.), representing a value of about 3,300,000 francs. See ALGERIA.

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[1] It is to be remarked that no gold money was coined in 1872 or 1873.

Other colonies.

The other colonies of France are—in Asia, Pondichéry, Karikal, Mahé, Yanaon, Chandernagor and Surate, and the French Cochin-China; in Africa, Senegal, with the island of Gorée, the island of Réunion or Bourbon, the islands of Sainte-Marie de Madagascar, Mayotte, and Nossi-Bé; in America, Martinique, Guadeloupe, St. Barthélemy, French Guiana, and the islands of St. Pierre and Miquelon; in Oceania, the Marquesas Islands, Tahiti, and New Caledonia. Among these settlements, Martinique, Guadeloupe, La Réunion, and Guiana are, properly speaking, the only colonies, the rest being rather mercantile stations, except perhaps the French possessions near Madagascar and in the Pacific Ocean, which have better prospects, and one of which, New Caledonia, now contains the principal penitentiary establishments maintained abroad by France.

All these colonies submitted, till 1861, to what was called the colonial pact, which bound them to France so closely and jealously that they could trade with no other nation than the mother country. This state of affairs has been greatly changed, chiefly for Martinique, Guadaloupe, and La Réunion; and but for some privileges of navigation and some special taxes, trade with the colonies is almost as free as trade with France itself.

Produce and trade of colonies.

An account of the colonies of France will be found under the particular headings. It is only necessary here to give some statistical information about their produce and trade, so far as it concerns the general state and interests of French commerce.

The island of Martinique specially produces sugar canes; they were cultivated in 1874 on a surface of 19,314 hectares (47,727 acres), more than a third of the entire area of the island, and yielded a return of 38,653,000 francs. Cocoa trees came next, covering 262,000 hectares of ground (647,539 acres), and giving a crop of 284,000 francs; then coffee, planted on 210,000 hectares (518,940 acres), representing a yearly income of 203,000 francs; and lastly, cotton, which occupies only 42,000 hectares (103,788 acres) and does not bring more than 34,000 francs. The foreign trade amounts (1874) to 61,810,481 francs, 28,398,309 francs for imports, and 33,412,172 francs for exports. In these totals the trade with France amounts to 36,700,560 francs.

The large island of Guadeloupe, with its dependencies La Désirade, Les Saintes, and the French part of St. Martin, imported in 1874 goods to the value of 24,526,212 francs, and exported 22,470,302 francs value, making a total of 46,996,414 francs, to which trade with France contributed 27,825,183 francs. The value of the natural produce is as follows:—sugar canes (20,686 hectares or 51,100 acres), 40,775,732 francs; coffee, 676,846 francs; cotton, 35,470 francs; cocoa trees, 120,300 francs.

Cod fishing is the principal industry of the islands of St. Pierre and Miquelon. The imports amount to 8,285,416 francs, the exports to 10,825,336 francs, and the trade with France to 9,913,532 francs.

French Guiana (Cayenne), which also contains penitentiary establishments, produces the same articles of trade as Guadeloupe, as follows:—coffee to the value of 48,028 francs; sugar canes, 243,984 francs; cocoa trees 52,430 francs; cotton, 1750. Its trade with France amounts to 4,914,002 francs; its imports to 6,571,067 francs, and its exports to 681,211 francs.

La Réunion or the island of Bourbon produces sugar canes to the value of 34,474,825 francs; coffee, 294,850 francs; tobacco, 494,100 francs; cocoa trees, 43,959 francs. The imports amount to 24,819,421 francs, and the exports to 30,219,829 francs. The trade with France is 34,869,267 francs.

The imports of Senegal (St. Louis and Gorée) amount to 12,134,631 francs, the exports to 16,628,069 francs, and the trade with France to 16,346,032 francs. The chief articles of trade are gum, gold powder, wax, ivory, a kind of vegetable oil, and valuable woods.

For Mayotte, Nossi-Bé, and Sainte-Marie de Madagascar the value of the imports is 4,080,229 francs, and of the exports, 3,773,280 francs. The trade with France amounts to 2,973,941 francs. The principal productions are sugar (5,088,750 francs), rice (1,799,008 francs), rum (334,480 francs), and coffee 11,275 francs).

For the French establishments in India (Pondichéry, Karikal, Yanaon, Mahé, Chandernagor, Surate) the imports are 6,675,583 francs; the exports, 17,671,100 francs; and the trade with France, 7,600,116 francs. Pondichéry and Karikal are the most important centres of cultivation, the former having 19,835 hectares under culture, which produce 1,494,714 francs, and the latter 9114 hectares yielding 1,122,525 francs.

The imports of French Cochin-China amount to the value of 67,044,022 francs, and the exports to 88,011,123 francs. This settlement comprises extensive cultivated grounds, distributed thus: rice, 279,703 hectares; fruit trees, 32,989; vegetables, 30,938; sugar canes, 8052; water palm trees, 5640.

In Oceania, the returns for the Society Islands, Tahiti and Mouréa, are—imports, 3,458,735 francs; exports, 3,112,989 francs; and trade with France, 562,369 francs.

For New Caledonia the returns are—imports, 12,561,577 francs; and exports, 880,970 francs. This large island might afford an extensive and profitable field to the enterprise of colonists, but it has hitherto been too much neglected by the Government, which considers it almost exclusively as a penal settlement, and has not even taken the necssary steps to secure the few plantations around the town of Nouméa against the inroads of the native tribes, who still possess the greatest part of the country.

France has lately acquired from Sweden the island of St. Barthélemy, in the Antilles. It is an islet of 25 kilometres (16 miles) in circumference, without drinkable water. This acqusition was made, it is reported, with the view of founding there a new penal settlement less distant from the mother country.

Bibliography.

Bibliographical Sources.—Annales and *Annuaires de l'administration française; Bulletin des lois;* publications of the Bureau de la Statistique de la France; Dufrénoy and Élie de Beaumont's *Carte Géologique;* Elisée Reclus, *Nouvelle Géographie universelle; La France,* Paris, 1877, 4to; M. Block, *Statistique de la France comparée avec les divers pays de l'Europe,* 2d ed., Paris, 1875, 2 vols. 8vo; M. Block, *Annuaire de l'Économie Politique et de la Statistique,* Paris, 1877, 24mo; Ib., *Dictionnaire de l'Administration française;* F. Germain, *Dictionnaire du Budget, exercice 1877,* Paris, 1877, 8vo; L. de Lavergne, *L'Agriculture et la Population,* Paris, 1875, 12mo; L. de Lavergne, *Économie rurale de la France depuis* 1789, Paris, 1877, 12mo; *Annuaire de l'armée,* Paris, 1877, 8vo; *L'Année maritime,* Paris, 1877, 12mo; Moreau de Jonnès, *Statistique de l'Industrie de la France,* Paris, 1856, 12mo; T. Duval, *L'Algérie et les Colonies françaises,* Paris, 1877, 8vo. (H. GA.)

PART II.—HISTORY.

I. INTRODUCTORY.

Early inhabitants of Gaul.

The extinct tribes which once thinly peopled the soil of France have left but scanty traces of their existence in the weapons and ornaments dug out of gravel-beds and river-courses. However interesting they may be to the student of ethnology and of the origin of man, they find no place in history; for neither in blood, nor manners, nor speech have they left any mark on the land they inhabited. Very different are those tribes whom Cæsar met when he first entered Gaul. The history of France may well begin with the words which open his famous chronicle—"Gaul is all divided into three parts."

Iberians.

Of the inhabitants of these divisions, the Belgians, Gauls, and Iberians, the third were in all ways different from the others; for the Iberians were a race of other origin, shorter, darker of complexion, less sociable, less bright, of more tenacity, possessed of that power of resistance which those whom stronger races drive out of the plains into the mountains quickly learn. On the northward and southward slopes of the Pyrenees, amid the fastnesses of that great chain, and in the Basque provinces of Spain, this race still dwells, easily discerned by characteristics of speech and appearance, which mark them off alike from Spaniards and Frenchmen.

Belgians and Gauls.

The Belgians and the Gauls were blood-relations. The former, dwelling chiefly in the northern districts of France, were later comers than their kinsmen the Gauls, stronger men and of a finer development. The Gauls, the men of central France, were a bright intelligent people, full of vivacity, frank and open of disposition, brave and scornful of tactics, as though all strategy were a lie and a disgrace. The Belgians seem to have been more staid, less active, less easily cast down, more thoughtful; they were not without a physical and moral resemblance to their neighbors and distant cousins the Germans. From these two tribes has sprung the modern Frenchman, who to this day, according to his part of France, bears the mark and sign of one or other origin.

When Julius Cæsar entered Gaul (58 B.C.), he found these natives in a half-barbarous state, split up into clans, each with its elected chieftain, its Druids or priests, and its body of warriors or horsemen; while below these was an undistinguished company of servile men, women, and children, who did all works of peace for their idle fighting aristocracy. Each clan lived to itself, with little or no power of combining even with its nearest neighbors. Its home was usually an open village of circular wattled huts, with one family dwelling in each hut. Sometimes, in places of strength and importance, the Gaul built himself a fortified town enclosed by earthworks, perched sometimes, like Alesia, on a strong hill-top, or entrenched in dark recesses of wood and marsh. The more close the tightening of the Celtic clanship, the more completely did each little community live to itself, apart from other clans; so that in spite of the great difficulties of the country, Cæsar found the reduction of it a tolerably easy task.

Before Cæsar's days Gaul had already known something of foreign invasion. On her northern and eastern frontiers were the Germans; in the south stood the Greek city of Massilia, the ancient rival of Carthage; and in 122 B.C. Caius Sextius had founded the town which bore his name, Aquæ Sextiæ, now Aix in Provence, whence, as from a centre, the Roman occupation spread through the district watered by the Rhone and its tributaries, until it received the name of Gallia Braccata, and became a province of the republic. Narbonne (Narbo Martius, founded 118 B.C.) was the new capital of the district, the first Roman municipium on the soil of Gaul. But invasion took an entirely new character when Cæsar was made proconsul (59 B.C.). He entered on his great conquest in the following year, and the reduction of the whole country was complete by 50 B.C. In the course of those years the great Roman penetrated to the utmost limits of Gaul, beat down all opposition, crushed the Helvetians back into their Swiss home; he defeated the Germans who had made secure lodgment in the Sequanian lands, and drove them into the Rhine; broke the resistance of the Nervii, all but exterminating that gallant tribe; severed the connection between Gaul and Britain, on which the Armoricans especially relied, by two expeditions across the Channel, in which he gained a great addition of glory, if little fresh power; the conquest of far-off Britain fired the imaginations of men: finally he brought the long wars to a close by the submission of Vercingetorix under the walls of Alesia.

Cæsar in Gaul.

Thenceforward Cæsar, having conquered the Gauls, became their emperor. He saw what boundless supplies of force, of enthusiasm and intelligence, were now at his disposal; with Gallic support and his own devoted legions, he was now able to give law to Rome herself. Meanwhile, he did all in his power for Gaul,—lightened her tribute, mitigated slavery, forbade human sacrifices, repressed the Druids. The country lost its independence, and became the docile pupil and follower of Roman civilized life.

For more than four hundred years the Roman domination influenced Gaul. At the beginning of the time the natives were savages, dwelling in a wild land of forests and wastes, a thinly scattered company of unsociable clans, without towns or roads or industries; at the end they had fine cities, and much cultivated land, wore the Roman dress, had adopted the Roman law, and had exchanged their own tongue for a new form of the common Latin language.

Augustus.

After the murder of Julius Cæsar, the administrative genius of Augustus found wide scope for its activity in Gaul. Lyons was the new capital, whence his four great roadways and his civilization radiated out in every direction. Several of the later emperors vied with him in their interest in Gallic affairs: Caligula spent much time at Lyons, and, in his grotesque way, encouraged letters there; Claudius was a native of that city, and threw open the senate to the Gallic chiefs; he established schools, emancipated slaves, and taught the Gauls the equality of all men under the law; Nero, with his Greek sympathies, delighted in Provence, though he cared little for the rest of the country—then called "Imperial" Gaul. All through this period new ideas, new pleasures and efforts, characterize the life of Gaul; and after the fall of Civilis in 70 A.D., no one in all the country dreams of any further struggle in behalf of the independence she had finally lost.

Christianity in Gaul.

All things were now preparing for the next great influence which should affect the Gallic race. For nearly a century, though Gaul and Rome seemed together to tread the downward path towards ruin, the Roman ideas as to justice, law, and order, were fitting the Gallic mind for the reception of Christianity. And Christianity soon came. In 160 or 161 A.D. we find a bishop of Lyons, Pothinus, and with him the well-known name of Irenæus. These men ministered at first to Greek and other settlers, for the early church of Lyons long bore marks of a Greek not a Latin origin. Gradually, however, the life-giving ideas and doctrines of Christianity spread abroad among the Gauls, and churches sprang up at Autun, Dijon, Besançon, and other towns within comparatively easy reach of Lyons. Roman Christendom, however, did little for Gaul till the middle of the 3d century (244 A.D.), when seven Latin bishops were sent thither, and formed new centres of Christian life in the land at Limoges, Tours, and even Paris, whither came Dionysius with a little company of brethren in 251. Henceforward Christianity spread swiftly; and though in the next century St. Martin of Tours still found heathen temples to overthrow and multitudes of country pagans to convert, still we may say generally that in three generations from the time of the Roman mission of 244 A.D. all Gaul had embraced the Christian faith.

These were also the days of what is called "the Gallo-Roman empire;" of the provincial emperors who strove to sever the Eastern from the Western world. Along her northern frontier also Gaul saw the establishment of the two Germanies, districts on the left bank of the Rhine, where German warriors held their lands by feudal tenure of the sword. Thus as Gaul herself languished under the loss of her independence and the influence of the moral corruption of Rome, she began to become aware of the two powers which were destined to mould her character—the Christian Church, and the fierce Germans. They advance upon her from south and north; when they meet, the Gaul bows the head before them, and in new union the feudalism of the Teuton and the Christianity of the Latins begin their task of education. The combination of the institutions of Germany with those of the church forms the basis on which the history of France is reared.

The Germans.

The Germans, who now began to overrun the soil of Gaul, were a very different race from those with whom they came into contact. Stronger and larger in frame, they were also more stable and enduring than the Gauls. Far back they claimed the same ancestry; in language and in personal characteristics alike we can trace the connection. Yet, thanks to climate and circumstances, the two races were by this time completely severed, alien in speech, ideas, institutions, and tastes. The German was a hunter, a man of independence of character; the Gaul lived in his clan, and shrank from personal freedom; slaves were unknown in Germany, while they swarmed in Gaul; the Gaul had an organized faith, a regular hierarchy between him and the supernatural; the German worshipped, independent and alone, without human mediator, in the depths of his forests. The fighting-men who grouped themselves round a German chief were his free comrades, connected with him only by a personal tie, each prepared to act independently if his time came, and to build up for himself a lordship of his own. On many sides these men now began to press into Gaul. The Goths, after wandering apparently from Scandinavia to the Black Sea and thence into western Europe, settled down,—the Ostrogoths in Italy, the Visigoths in Spain and southern France. The Burgundian Vandals, from Low Germany about the Elbe and Vistula, now began to stream over into eastern Gaul, giving their name to a large district of the country; the Franks, an aggregate of northern tribes, Low Germans of the centre and the west, were destined to be the chief conquerors of the land, the authors of her modern name.

Church organization.

But before the German had become master of Gaul, the Christian Church had already firmly established itself. Thanks to the support he received from Christianized Gaul, Constantine was enabled (312 A.D.) to enter Rome in triumph, and to assure the victory to the church in her struggle against paganism. Henceforth the church, which had always endeavored in her organization to copy the civil power, was officially modelled on the lay institutions of the later empire; her dioceses corresponded in position and extent to those of the civil administration; the chief clergy became important magistrates. The bishop of each city with his clergy took the place of the older curials, the members of the civil municipality; the old relations of church and state were profoundly modified by the rise of the bishop of Rome to the position of supreme pontiff, a title given up by the emperor. In the downfall of Roman society in the fourth century, the clergy alone retained some power, and showed promise of the future. The lay power struggled hard for a while against the German invasion, specially against the Franks; the church stayed in the cities, secure and growing stronger against the day when she too would have to face the invader, and to convert him from a heathen foe into a firm ally and friend.

The Visigoths.

The Franks.

In the 5th century the Germans ceased to plunder and ravage, and began to settle; it is the age in which Gaul exchanges her Latin for her Teutonic masters. Early in the century a vast horde crossed the Rhine on the ice in mid-winter, and streamed over northern, central, even southern Gaul, passing thence a little later into Spain. In 412 Ataulf the Visigoth settled down in the valley of the Rhone, and allied himself with Rome; the Burgundians also occupied the Sequanian lands. These two tribes were friendly towards the older inhabitants, and were recognized as peaceable settlers by the imperial power; they showed that they deserved well of the falling empire by the gallant and successful resistance with which in 450 the Visigoths and Gallo-Romans defeated the terrible hordes of Attila at Chalons-sur-Marne. Yet the empire thus saved for a time could not be saved from internal decay; confusion reigned throughout Gaul, the Germans and the Gallo-Romans struggling as it were in the dark for possession; and when in 476 the empire of the West finally went under, Ewarik (or Euric), the prudent Visigoth, was left as master of all that had belonged to Rome beyond the Alps towards the west. The Arian Goths, with Toulouse as their capital, might have secured their authority over all France if the church had accepted the views of Ewarik, and if that vigorous prince had lived. He died, however, in 485, leaving behind him only a weak boy as his successor; and far to the north the fierce Frankish warriors had already taken as their chief the youthful Hlodowig (Clovis). The Franks, a loose confederation of Germanic tribes, were in existence in the third century on the right bank of the Rhine, and for a long time showed no wish to migrate into Gaul. By degrees one of these tribes, the Salians, headed by a family called the Merewings or Merwings (the Merovingians), began to take the lead; they soon made themselves formidable by their incursions on northern Gaul, and established themselves masters of the left bank of the lower Rhine. As the Roman power declined along that district, their authority increased; early in the 5th century they had spread from the Rhine to the Somme. Another leading tribe of Franks, the Ripuarians, whose home lay on the Rhine about Cologne, less tempted towards Gaul, seemed to hold themselves in reserve for the future.

Hlodowig or Clovis.

In 481 Hilderic, chief of the Salian Franks died, leaving behind him a boy of fifteen, Hlodowig or Clovis. This youth, endowed with unusual vigor and fierceness, soon won a great reputation among the Franks, and in 486 broke in on the only Roman power now left in northern Gaul, the degenerate legions commanded by the patrician Syagrius of Soissons. These were swept away like the autumn leaves before the wind, and Hlodowig settled down in the lands which he had won. Here he at once came into contact with Christianity; Remigius bishop of Rheims becoming his friend and adviser long before he adopted the Christian faith. It was probably through his influence that the young king married Hlotehild, niece of the Burgundian king, a Christian maiden. In the quiet years which followed Hlodowig doubtless became more and more inclined towards his wife's belief; and when, in repelling the invasion of the Allemans in 496, he believed that the "god of Hlotehild" had heard his vow, he at once declared his gratitude and his conversion. Some thousands of his wild warriors followed him to the font, as willingly and with as little thought as they would have followed him to death or victory. From this moment the firm alliance between the church and the Frank began, an alliance which affected both; the church became more warlike and aggressive, the Frank grew more civilized, and learnt the art of ruling.

With their headquarters fixed in northern Gaul, the Franks, under Hlodowig's command, reduced first their cousins, the Burgundians (500 A.D.) and then (507) the Visigoths under Alaric. All France, with exception of a rich strip of land between the mountains and the Gulf of Lyons, afterwards called Septimania, was overrun and plundered. This done, Hlodowig spent the rest of his days securing his dominion by the destruction of all powerful neighbors or competitors; for the grim Frank, vigorous and ambitious, knew neither scruple nor pity, and the clergy round his throne passed over crimes which they were powerless to prevent. When he died in 511 the settlement of the German on the soil of Gaul had been accomplished, and Hlodowig, who has no claim to honor as a man of constructive power, still stands out in history as the founder of a new world in France. To him France owes that feudal relation which has so deeply marked her story; in him the church first made that connection with feudalism which lowered her character, while it strengthened her power and influence. Not without reason does France inscribe on the first page of her history this German conqueror, a robber, a liar, a murderer,—for it is from him that modern France rightly dates her beginning.

Feudalism.

The origins of feudalism are simple enough. When the Franks came in under Hlodowig, they were a host of free and equal Germans under the king of their choice. The belief that he brought with him a graduated hierarchy of chieftains, who at once established a complete "feudal system" on the conquered soil, is no longer tenable. No doubt the most influential and vigorous of Hlodowig's followers got most in the distribution of lands and spoils; still, in theory at least, all free Franks were equal, and in the new settlement of the country each man according to his strength took what he could get. The older conditions of the Germanic peoples had died out of the Salian's life; the institutions which appear in an indistinct form in the *Germania* of Tacitus had already undergone great change; the family of tribes, with common rule of usage and very slight bonds of political union, is, as Professor Stubbs remarks (*Constitutional History*, i. p. 36), "singularly capable of entering into new combinations; singularly liable to be united and dissolved in short-lived confederations." It was one of their late-formed confederacies over which Hlodowig, with the vigor of barbarous youth, had now come to rule. The Salian law, a collection of the customs of Frankish law in the 5th century, gives us a fairly clear view of the condition of those who streamed over into Gaul at this great chieftain's back. We learn from it that among the Franks the kingly office was fully recognized, and though the form of election by the nation is preserved, the choice is limited to the members of a single family, so that hereditary succession partly prevails. The king, once chosen, is the real head of the nation; he has not as yet run any risk of becoming a *fainéant*; he appoints the rulers of provinces, if we may use this Roman term,—that is, the grafs who are set over certain aggregations of hundreds; and the graf or reeve, to take the English form of the word, is an administrative officer, who carries out the sentences of the courts of justice. The king also appoints the officers who collect the royal dues in the "vills" which had succeeded in the place of the primitive "marks" of the Germanic peoples. Round the king's person is his "comitatus," his aggregate of immediate followers, who form his guard, and are the germ of the later feudal nobility. The nation in arms forms the equal council, in which all men give voice and vote alike; justice is administered by a hundred-court or mall, composed of qualified landowners; if any one is aggrieved by their decision, he can appeal directly to the king. It is round this "hundred" that the Frankish system really moves, for it is out of a group of hundreds that a district with its graf is formed; and there seems to be no court of law superior to that of the hundred. All political questions are of course the affair of the national council. There is in the Salian law no trace of a primitive nobility; though the old system of common land has disappeared, giving place to separate ownership, the land does not carry with it any special honor; the Franks are still very far from any ideas as to a territorial nobility.

These were the institutions which Hlodowig transplanted out of the districts of the lower Rhine into Gaul. They came into contact with the tenacious Gallic temper, and the masterful organization of the Romans. The Franks, with singular energy and success, adapted themselves to their new place as conquerors; and, giving and taking, laid the foundations of modern French life. Their settlement was slow and unsystematic; the king, receiving a large portion

511-558.

of the soil as his domain, granted out of it benefices for his immediate friends and followers. These gifts were at first held on pleasure, and were liable to be resumed at any time; after a while this precarious tenure suited neither party; these fiefs became first life-holdings, and finally hereditary possessions, held on tenure of service of some kind. The greater chiefs, with the king, took their share of conquered lands, asserting their rights to an alodial holding, and, if they chose to do so, granting out benefices from these districts to their followers. The common sort of Franks, who were neither king's friends nor independent chiefs and their friends, took what they could get, their share of the spoil as it fell to them; and as their strong arms were useful and marketable possessions, we may be sure that many of them grouped themselves round the king, and, if they were fortunate, were rewarded with small benefices. A considerable part of the land was left in the hands of the Gallo-Romans undisturbed, and became tributary—the tribute being a kind of rent paid by the old owners to their new masters.

Thus the Franks were spread over the whole surface of the soil; they were at home in the country, and shunned the cities; civic life was distasteful to them; the air of the streets too confined for those who loved the forest and the chase as all Germans did. Consequently, in the towns the Gallo-Roman bishops retained sole authority, ruling by the Roman law, and preserving the last remains of the civilization of the past. The church, however, was far from confining herself within these civic limits; though she stood aloof from feudalism at first, deeming her own ways better, she soon showed a consciousness that the centre of power no longer lay in the cities, and that her influence must be felt at the king's court. Consequently, we soon find the bishops grouping themselves round the king, acting as his advisers, modifying the Germanic ideas, and in turn receiving new ambitions from their masters. Ere long the bishops will begin to take place in the feudal hierarchy, and will form a recognized part of the new nobility of the realm; though for a very long time the Franks clearly regarded the clerical life as unsuited to their character, and left the influence and fortunes of the church entirely in Gallo-Roman hands.

Before Hlodowig died (511) he had destroyed all the old chieftains and knights who ruled in Gaul. He took the place of Roman and Goth; the Visigoth shrank away southward; the Burgundian became tributary; the Frank was recognized as undisputed master of all the country; the northern barrier lines between Gaul and Germany perished; as fresh bands of Franks poured into northern France from time to time, the Austrasian princes renewed the Germanic influence over Gaul; and for five centuries the history of France must be regarded as in most respects subordinate to that of Germany.

Partition of the Frank kingdom.

Germanic use prevailed in the new kingdom, and when Hlodowig was gone, his four sons all became kings, each representing one of the divisions of the original invasion. Theodorik, the eldest, took the north-eastern part, and became king of what ere long began to be called Austrasia; he lay on both banks of the Rhine, and was almost entirely German, with his capital at Metz. Hildebert, eldest son of Hlotehild, had the central district, the country round Paris, with Paris as his capital. Hlodomir, the next, was king of Orleans, and had western Gaul along the Loire. The youngest, Hlothar, was king over the old Salian land, the north-western corner of Gaul, with his capital at Soissons. The partition was a division of estates rather than of governments; the four kings regarded the country north of the Loire as their home, and divided out all beyond that river at will by arbitrary lines. As yet a king was little more than a leader in war, and his free men, his "leudes," looked to him to give them plentiful employment in that way, even compelling him at times to go on expeditions against his own better judgment. Thus it fell out that this first partition did not weaken the Franks; they attacked their neighbors on every hand. In one of these wars (in 524) Hlodomir, king of Orleans, was killed; his brothers seized his inheritance, and on Hildebert's death (558) Hlothar of Soissons became sole king of the Franks; in 555 he had taken possession of Austrasia. Hlothar's rule brings the name of Neustria into prominence. The two branches of the Frankish power become clearly distinguishable,—the German Austrasians coming down to Lorraine, and including the eastern part of Champagne, as these districts were later called, and the Gallic Neustria covering almost all modern France. And Neustria settled quickly into a monarchy of more modern type. Round Hlothar were grouped his reeves or counts; the clergy made their court to him; the "leudes" now became the king's "trusty men;" not a few Gallo-Romans also held office under him.

Neustria.

558-598.

Second partition of Frankish kingdom.

On Hlothar's death (561) the Frankish kingdom was once more divided into four parts—Austrasia, Paris, Soissons, and Burgundy,—the eldest son, Sigebert (as in the earlier partition), taking the north-eastern country. When Haribert, king of Paris, died in 567, Hilperik, his brother, king of Soissons, seized his share, and became king of Neustria. And now the three Frankish kingdoms of Austrasia, Neustria, and Burgundy take definite forms. Speaking generally, Austrasia lay between the Meuse and the Rhine, Neustria between the Meuse and the Loire, though Austrasia trenched somewhat on Neustria on one hand, and stretched far up and even beyond the Rhine on the other side. Burgundy included the upper waters of these rivers, and of the Saone as well. The rivalry lay between the Austrasians and the Neustrians; the Burgundians, being the weakest and most peaceful of the three, sided sometimes with the one, sometimes with the other. This rivalry finds its expression in the half-legendary strife between the haughty high-born Brunhild, wife of Sigebert, king of Austrasia, and Fredegond, the low-born mistress of Hilperik, king of Neustria.

The mayors of the palace.

Before the end of the 6th century we discern a new power rising into distinctness,—the power of the mayor of the palace, an officer, as his name denoted, having great authority in the king's court, elected by the chiefs, and acting almost independently of his master. In Neustria we usually find the mayor of the palace siding with the royal power; in Austrasia, where the nobility were much stronger, he checks and overshadows the king; in Burgundy he is only an insignificant person, being of inferior importance to the patrician, whose office, as the name tells us, was a relic of past Roman days. Another, and a far more beneficial influence, also appeared at this time; the Benedictines came across from Italy, and spreading throughout France, formed many centres of fresh life in the confusion of the land. They revived the faith in industry, well-nigh destroyed by the Franks; they did something to rescue the older inhabitants from misery, and culture and letters, thanks to their well-directed energies, again raised their heads.

At the end of the century the two queens, Brunhild and Fredegond, were the two rulers of all the country; for Brunhild had charge of her two grandsons, Theodebert II., king of Austrasia, and Theodoric II., king of Burgundy, while Fredegond governed Neustria for the youthful Hlothar II. So early does the extraordinary prominence of regency appear in French history. After Fredegond's death in 598, Brunhild seized on almost the whole of Neustria, and for a while seemed once more to unite the Merwing lordship under her rule. Her chief aim was the establishment of a solid monarchy in Austrasia, which should curb the power of the nobles; they, in opposition to her, placed at their head two brothers, Arnulf bishop of Metz, and Pippin of Landen, the ancestor of that great family under the auspices of which modern society laid its foundations in both Germany and France, the great Karling or Carolingian dynasty. Led by these two men, heads of the lay and spiritual aristocracies, the Austrasian nobles met the aged queen; her army deserted her, leaving her with her four great-grandchildren in the hands of Hlothar II., the nominal chief. He put the children to death at once, and after shameful indignities, the queen, it is said, was tied to the heels of a wild horse and so dashed to pieces. Her death was a triumph of aristocracy over monarchy. Hlothar II., now sole king of Franks, was entirely in the hands of the mayor of the palace, who became a real power in the state, representing the interests of the nobles as against the centralizing tendencies of the kings.

This victory of Neustria, though it paved the way for the eventual domination of the Carolings, was in itself "the triumph of weakness over strength, of the Gallo-Romans and the priests" (Sismondi). The victorious nobles endeavored to secure their supremacy. The bishops, who were now found sitting in the assembly of the "leudes," drew up

628–732. a new ordinance, a "perpetual constitution," a first attempt to substitute ideas of justice in the place of custom based on force. This, however, in the nature of things, could not check the growing power of the nobles, especially in Austrasia; though for a time royalty, under Dagobert (628–638) showed a good front in Neustria. In him the Merwing monarchy reached its highest point; his splendid court at Paris laid the foundations, not altogether sound ones, of the civilization of France. At his death his monarchy crumbled away. Children were kings in both Austrasia and Neustria; we reach the days of the "do-naught" princes, the *rois fainéants*, and of the struggle between the mayors of Austrasia and Neustria. Ebroin, the Neustrian, for a time held out against his rivals; but the Austrasians placed at their head the representatives of the Caroling family, Martin and Pippin, grandsons of Pippin of Landen; and, Ebroin having been assassinated, Neustria had nothing wherewith to resist the onslaught of the German Franks. Led by Pippin of Heristal, they burst into the valley of the Seine, and at Testry in the Vermandois, the long struggle of the two Frankish powers came at last to an end (687). There the Neustrians under Berthar, mayor of the palace to Theodoric III., were entirely defeated, and henceforth, though the line of Merwing kings lasts till 752, they become insignificant and powerless. We turn our eyes with pleasure towards the rising splendor of the Caroling house. France finds herself on the skirts of a new Roman empire, of which the seat is in Germany, and which in its main features belongs to German not to French history.

The Carolings.

To no small extent the Neustrian Franks had lost their old Germanic vigor before this time; perhaps among the chief symptoms of change is the fact that many Frankish names may be read among the upper clergy of the time. In the absence of sufficient evidence it is impossible to say how far they had condescended to learn the "rustic Latin" which the older inhabitants all spoke, the parent of the modern French language; still, there can be no doubt that they must have spoken it to some extent, if not as their sole speech. Now, however, the Austrasian conquerors began to bring things back to a German form. The ancient "Fields of March" are held again; thither come the warriors in arms as of old; German conceptions as to justice seem again to prevail over the more orderly Roman law. The new-comers are above all things an army; and it is the fortune of the Austrasians, not only that they have soldiers and love fighting, but that they have great captains at their head. From Testry (687) to the end of his life in 714, Pippin of Heristal was unquestioned master of all Franks, the kings under him being utterly insignificant. While he kept his Neustrian subjects submissive, he applied the enthusiasms of the sword and the cross to the wild Germans on his eastern border. Under him began the heroic labors of those English monks whose is the high honor of having first introduced the Christian faith among the pagan Teutons.

Charles Martel.

On Pippin's death things seemed likely to fall back into confusion; the Neustrians shook off the yoke of their German lords, and Austrasia was threatened at once from every side; Frisians and Saxons, as well as Neustrian Franks, overran the country, vainly opposed by Pippin's widow, Plectrude, who ruled in the name of her grandson, a child. Austrasia, however, was saved by the energy of Pippin's natural son Charles, whom Plectrude had thrown into prison, and who now emerged as a strong leader of the nobles. He defeated the Neustrians at Vincy, near Cambrai, in 717, repelled the Saxons from the Rhine, reduced Plectrude, who had taken refuge at Cologne, and became undoubted head of the Franks, as his father had been before him. His father's rise had been the work of the lay and spiritual nobility; the power of Charles was based on the sword alone; he was regarded by the churchmen as their foe; he took of their lands to reward his soldiers, punishing the noble bishops while he encouraged the more popular monks. Though the clergy treated his memory with vindictive anger, the lay lords were firm on his side, and enabled him to found the great dynasty of the Carolings. For it was their ready sword which won him the victory of Poitiers (or Tours), in which Europe set a limit to the advance of Asia, in 732. The Arabs, possessors of almost the whole of Spain, had for several years poured over the Pyrenees into southern Gaul; held in check a while by the vigorous Odo (or Eudes) king of Aquitaine, they proved at last too strong for him and he appealed to Charles to rescue him. The Franks responded nobly to the call, and in a few years Charles had driven the Saracens out of all their points of vantage north of the Pyrenees. It is said that to the battle of Poitiers Charles owes his name of "Martel," the Hammer, for the vigor with which he smote the Mussulmans. Other accounts have been given of this sobriquet; on the whole the common explanation of it is the most probable and the best supported. All the rest of his life this great duke of the Franks struggled against the pertinacious foes who attacked his frontiers. His power may be said to have been limited by the Rhine to the north and east, and by the Loire to the south.

732–771.

Just before his death he divided his dukedom between his sons Carloman and Pippin the Short. As usual, the elder had the Germanic share, but under the influence of Boniface, the English monk and missionary, whom he made archbishop of Mainz, he, after six years of successful rule, laid down the burden of power and became a Benedictine monk. His ducal rights he handed over to his brother Pippin who had become sole duke of Franks. His father and brother had opposed the power of the bishops by the help of the monks; it remained for Pippin to go a step farther, and linking together the monks with the papacy, to win for himself the name of king. The monks had been the papal militia for the conversion of Germans; the converted Germans in their turn became firm friends of the Frankish dukes. The head of the whole movement was St. Boniface the founder of the church in Germany; he it was who, acting under command of Pope Zachary, crowned Pippin king of Franks in the cathedral at Soissons. Pippin thereby became lord by a new title of the eastern and western Francia, or Frank-land, ruling over a large part of modern Germany and of modern France north of the Loire at least. The last of the Merwing shadow-kings, Hilderik III., was deposed, and thrust into the convent of St. Omer, where he shortly after died, and the race became extinct. On three sides Pippin was called to combat three powers, foes of his new royalty, foes also of the Church of Rome. The pagan Saxons did not detain him long: in one campaign he extorted from them the right to send his monks among them as missionaries; the rest he left to time. The Lombards, under their king Haistulf (Adolphus), had seized Ravenna, and threatened Rome herself, and Pope Stephen fled to Pippin for help. The Frank king crossed the Alps, and compelled Haistulf to give up to the Church of Rome the town of Ravenna, the Emilia, the Pentapolis, and the duchy of Rome itself. This is the famous "Donation of Pippin," the foundation of that temporal power of the papacy the end of which we have seen with our own eyes. The papacy raised up the Franks as their champions and defenders; they were set as a counterpoise to the grand claims of the empire at Constantinople, and as antagonists to enemies in Italy. No wonder if before long the papacy saw its advantage in the restoration of an empire of the West under new auspices, and if Germany in return willingly interfered in the affairs of Italy. The political life of modern Europe now begins. The rest of Pippin's reign was chiefly occupied with the resistance he found in southern Gaul. In 758 he took Narbonne, the capital of the Arabs, and drove the Mahometans out; he attacked the Aquitanians, who, after their wont, made tenacious resistance. On the death of their duke Waiffer, he overran their whole country, though he never occupied it permanently. Centuries must elapse before northern and southern Gaul could become one France.

Pippin the Short.

Charles the Great.

In 768 Pippin died at Paris, leaving his dominions to his two sons Charles and Carloman. In 771 Carloman also died, and Charles became sole king of Franks. The reign of "Charlemagne" is begun, the great German lord who in fact and legend filled all the world. The seat of his father's power lay, on the whole, in Neustria, and his chief struggles had been for dominion over Aquitaine; the seat of the power of Charles himself lay on or near the Rhine; his three chief palaces were at Engelenheim, Aix-la-Chapelle, and Nimwegen. His whole temper, history, relations, were strictly German; the part played in his life by Neustria and Aquitaine was, by comparison, insignificant, for Charles the Great belongs to world's history, not to the history of France.

771–814. His first task after his father's death was to complete the reduction of Aquitaine; for here war had broken out again when Pippin's death seemed to the southerners to give them their opportunity. Charles beat the old Duke Hunold in the field, and drove him to take refuge with the Lombards, where some time later he fell, helping to defend Verona against his and their hereditary foe. The struggle in Aquitaine, hopeless if vexatious, lingered on, until at last the wise king, as imperial ideas grew stronger in him, saw that his one hope of success with them lay in giving them an independent life of their own, under due restrictions. He therefore set over them his little son Hlodowig as king, and appointed William Courtnez, count of Toulouse, as his tutor. The child was established at Toulouse, and brought up as an Aquitanian. The south retained its distinctive characteristics, and was saved from the degradation of having to fall back to the lower level in art and civilization which prevailed among the Franks. The kingdom of Aquitaine had for its southern frontier the river Ebro in Spain, and crossing the mountains reached the open sea just below Bayonne; the northern frontier at first was less well defined; before the end of the 8th century it was pushed on as far as to the Loire.

And just as Hlodowig was established in Aquitaine, so in 776 Charles set his second son Pippin over the Lombards, thereby securing his permanent influence over the see of Rome. The papacy throughout leant on him for support, and was even content to recognize his supremacy. For a quarter of a century Charles's life was spent in ceaseless wars on every side, in which he slowly though surely beat down the resistance of heathen Saxons, of Huns, of Lombards, of Saracens. Within the limits of modern France, after the pacification of Aquitaine, the only war was that against the Armoricans, inhabitants of Brittany,—a slow, stubborn contest, which lasted till near the end of his life. For a short time Brittany became a portion of the empire, without, however, in the least losing any part of its independent character.

Charles crowned emperor. By 796 Charles had secured his ascendency throughout Europe, so that when in 799 Pope Leo III. was ejected from Rome by the citizens, he fled to him for refuge and help; and Charles, in the autumn of 800, replaced him on the pontifical throne, receiving in return, on Christmas day, the solemn titles of Emperor of the Romans, Augustus; and certainly, if ever the great echoes of the past were to be awakened, they could not have been aroused for a worthier prince. "A Latin priest gave to a German soldier the name of that which had ceased to exist," says La Vallée. None the less was Charles a real emperor, ruling over subject princes; the Germans and the Romance peoples alike accepted his sway; and for fourteen years, with less of fighting and more of organization, Charles the Great proved that he was worthy of his high title and revived office of Emperor of the West. In 806 at Thionville he settled the succession to his empire; but as death bereft him of his eldest son Charles and his second son Pippin, he was obliged in 813 to make a fresh arrangement. He made Hlodowig, the one surviving son of his second wife Hildegond, his heir and successor, crowned him, and saw him saluted emperor. After this, he lingered a few months, and died early in 814 at Aix-la-Chapelle. It was doubted whether he should be buried there or at St. Denis, where his parents' bones had been laid. Austrasia, however, prevailed over Neustria, the Germans over the Frenchmen, and he lies at rest these thousand years past in the church he himself had built in the city he loved so well.

State of France in his reign. The state of what is now France under his care was this. The land was cut asunder at the Loire; to the north of that river was Francia Occidentalis, the earlier Neustria and Burgundy; to the south of the Loire lay Hlodowig's kingdom of Aquitaine, governed by Roman law, and home of precious remains of Roman culture. In Francia Occidentalis were Frankish nobles, the clergy, the free Franks, the inhabitants of cities, and the slaves, the last in ever-growing numbers. The first and second of these classes soon began to secure their position as great feudal lords, half independent. They laid the foundations of that system of feudal noblesse which became almost omnipotent under the weaker Carolingian princes, which brought about the revolution placing Hugh Capet on the throne, which resisted the centralizing tendencies of the monarchy under Louis XI. and Louis XIII., which became the devout servants of the Great Monarch, and finally ended with the monarchy at the Revolution. The reign of Charles the Great is the time at which these nobles began to see that their strength was based on the land; their position grew more territorial, their allegiance and honors less personal. Charles endeavored to resist this tendency, but his hand could not be everywhere, and the nobles on the whole held their own, though so long as he lived they still bent before his power. 814.

The administration of Gaul at this time was in appearance fairly complete, though it doubtless often failed in its practical application. Handed down from former days, in the larger towns there were always two chief personages, the count and the bishop, of whom the former officer was of Frankish origin, the latter of Roman. To a considerable extent, as was the case throughout all early Christendom, the functions and jurisdiction of the bishops originally answered very closely to those of the lay power, the church-organization being copied from the organization of the empire. Now each of these greater officers had its own jurisdiction and court; each administered therein law, the bishop according to the Roman order, the count according to Frankish usage; and, though their functions might sometimes clash, on the whole they joined in preserving peace and quiet within the walls. The counts also attended to the war-force and collected the taxes; while the bishops, on their side, were charged with the teaching and the moral life of their flocks. Between them they preserved a considerable amount of municipal life and character in the ancient cities. Under the counts we find local officers whose business it is to hold lesser courts in the bourgs and villages round about. These were the centeniers, or hundred-men; there were also here and there traces, as in England, of a lower division into decuries or tythings; the counts had also their "viguers," their "viscounts," as they were afterwards called, who represented them, and they also appointed (if the work were not done by the Missi Dominici, the imperial commissioners) officers called scabini (échevins, or in German Schöffen), local judges who held lesser courts in country places. In addition to these courts each chief and each considerable churchman held his own pleas; by these the condition of the free Franks, of the slaves, and of such persons as were still just above the servile state, was decided, all questions between them and those above them adjudged, with no very happy results in the main.

The emperor, honestly desiring, so far as he could, to arrest the downward progress of the feeble free Franks and of the still more wretched slaves, sent forth the above named Missi Dominici to travel through the different districts of the empire, and to see with their own eyes the state of the people. Usually, they went out in pairs, a layman and an ecclesiastic, so that the secular and church courts and benefices should each be inspected by a man of the same order as the lord whom they visited. They traversed the districts assigned to them in circuit four times a year, held courts to which even the counts were bound to come, looked into the details of government, reformed gross abuses, reported to their master on all persons, even the highest, appointed when needed fresh scabini and others, removed unworthy persons, looked to the poor, protecting them as far as possible from want and want's kinsman the oppressor. The great evil of the time was injustice defended by bribery; the local judges could not resist the powerful or wealthy ill-doer, and so the wrongs of the poor remained unredressed. The Missi, with more or less success, endeavored to lessen these evils. We may believe that in the main the clergy worked willingly with them: they had closer relations with and warmer sympathies for the poor folk; they administered a more stable and intelligent code of laws; they were the depositories of learning, and desired to educate those around them; even in the worst times the humane morality of the Gospel gleams forth. In the days of Charles the Great all churchmen turned to the emperor and paid willing allegiance to him; the ancient political coolness between the Carolings and the episcopate entirely disappears.

The elements of society in Gaul at this time may be easily summed up. There were great Frankish lords, gradually diminishing in numbers as they grew in power and territorial independence; there were great bishops, chiefly in the cities, and lordly abbots in country places, who were all by degrees becoming assimilated in condition to the Frankish

814-840.

nobles; there was also a rustic clergy, whose state was poor in the extreme; then there were the free Franks, scarcely above the level of slaves, and ever slipping down into the servile class; then Gallo-Romans in much the same condition; and lastly the slaves, who are said to have formed nine-tenths of the population. The picture is one of great wretchedness, oppression, injustice; the great Charles himself felt no sure ground under his feet in dealing with the social condition of his subjects. It is clear that society must pass through vast changes before anything like an orderly and flourishing community could exist, and that even the splendid climate and soil of Gaul would long do little to better the condition of its inhabitants. The wretched period which comes to Gaul after the death of Charles is the time in which, from the older relations of chief, free Frank, and slave of war, we pass gradually and almost insensibly to the later feudal relation of lord and vassal and serf. The coming time was, as has been said by Hallam, "the age of the bishops;" but in fact the bishops were only doing in their sphere what the lay chiefs were also achieving in theirs,—laying the foundations of a feudal independence which was for ever striving to lapse into feudal anarchy.

Louis the Pious.

On the death of Charles the Great, the eyes of all turned hopefully to his only surviving son the gentle Hlodowig, Louis the Pious. His father had summoned him to Aix-la-Chapelle, had made him emperor, and then had sent him again to Aquitaine till his time should come. In him all sweet qualities of piety, morality, culture, seemed to find their home. His Aquitanian rule had brought with it untold blessings to the south; he, too, had learnt their best lore, had become acquainted with their art, their poetry, above all with the Roman law; he was a man of thirty-five when he became emperor, vigorous, pure-souled, intelligent. Men thought that his father had done the rough-hewing of his great work, and that the new emperor would be the organizing Augustus following the creative Cæsar. His soul was full of high and conscientious aims; he would make reforms which should regenerate without weakening society; he would restore the clergy to high authority, would give full powers to the great lords, would save free Franks from slavery, and thus secure harmony and peace throughout his vast dominions. How different was the actual result! This noble prince, so dignified, earnest, right-minded, of "sound mind in sound body," gentle and simple, had all the dangerous virtues which grow to be calamities in rough times; his monkish tastes, his Christian forbearance, his want of an unscrupulous will, all pointed towards failure. Even within his house he was not master; and in the broad wild territories of the empire he was destined to a like failure. On the death of his first wife, Hermingond, who had borne him three sons, Hlothar, Pippin, and Hludwig, he married Judith, daughter of Welf the Bavarian, a dangerous and ambitious lady. Her son Charles, afterwards styled "the Bald," brought the emperor many troubles, for the natural jealousies sprang up between the children of the first bed and the second wife and her son. War soon followed, in which personal ambitions were seconded by the ancient enmity between German and Gallic Franks. Struggle followed struggle, partition led to partition; there is no drearier piece of history than Nithard's short chronicle of those years. The unlucky Hlodowig was buffeted about, now deposed, then restored again; now bowing his head before the clergy of Roman France at Compiègne, now recalled to rule, as it seemed, by the unanimous voice of his sons and his subjects. The main result was the separation, which then began, of France from Germany. In the midst of it Hlodowig the Pious died in 840, and was buried at Metz.

His death was the signal for the final disruption of the empire of Charles the Great. Hlothar, his eldest-born son, took the imperial name, and claimed supreme headship over the Franks. The Bavarian or German Hludwig, and Charles, who represented the Franks in France, both resisted; the Franks in Italy, Aquitaine, and Gothia, rallied to the emperor. War broke out at once. As soon as ever the Aquitanians had joined his forces Hlothar challenged his brothers to battle, and they at once accepted his wager.

On the banks of the Cure, near Troyes, was fought the great battle of Fontanet, which brought the griefs of the age to a point. There the whole Frankish race struggled for the mastery. From Italy, Austrasia, Aquitaine, Gothia, came the emperor's supporters; Germany, Neustria, Burgundy, supported Charles and Hludwig. The carnage was terrible; Fontanet is the burial ground of the old Frankish life; free Franks are heard of no more; "there remained in Gaul only lords and serfs; all things are made ready for the increasing of feudalism." Hlothar was entirely defeated and fled northwards to Aix-la-Chapelle; Charles and Bavarian Hludwig were masters of the field. When next year the two brothers found themselves once more menaced by the emperor, they met with all their forces at Strasburg, and took solemn oath each to other, Hludwig swearing in the "Roman" tongue, the earliest French in existence, and Charles the Bald in the "Teudisc" or German; and the armies standing round them repeated the words, the German Franks in German, the Gallic Franks in French. The text of the oaths is preserved for us in Nithard;[1] they are a striking evidence of the way in which Germany and France were asserting each its independent character. The "Romance tongue," the speech of the common people in France, their modification of the Latin they had learnt long before, henceforth took the place of the Latin language on the one side, and of the native Germanic speech of the Franks on the other; henceforth the name of Frenchman may come into use.

840-843.

As a result of this agreement between Charles and Hludwig, Hlothar was driven back to Aix-la-Chapelle. He thence fled to Lyons, to be near his southern friends; and, finally, finding himself completely overborne by their opposition, he made with them the famous Treaty of Verdun in 843, in which three kingdoms were distinctly marked off:—France for Charles the Bald; Germany for Ludwig the Bavarian; for the emperor Italy and a long narrow strip lying between Germany and France, a conventional district, which a little later received from its lord, the second Hlothar, the conventional name of Lotharingia or Lorraine. Charles the Bald had for his kingdom all Gaul west of the Scheldt, the Meuse, the Saone, and Rhone; it ran down to the Mediterranean, and was thence bounded by the Pyrenees and the Atlantic. It included therefore the chief part of modern France. It was Charles the Bald also who allowed the county of Paris to become a part of the duchy of France, so that the dukes of France were also counts of Paris; from this arrangement sprang eventually the decision of the momentous question as to what city should become the capital of modern France. In this manner the magnificent empire of Charles the Great came to an end, and in its place arose the nations of Europe. Speaking of the year 841, Nithard tells us that throughout the breadth of France the utmost confusion and rapine oppressed the people; in thirty years there had been five partitions of the Frankish empire, each marked with its own violence and misery; and the condition of the inhabitants, groaning under the ambitious foreign rule of quarrelsome princes, was as bad as well could be. The time, however, was now coming in which the greater lords of Neustria began to forget their German interests and nature, and to move towards a national French life. At first their action was chiefly disruptive, aiming at a local territorial independence; lay lords and great bishops alike pushed their pretensions to the farthest point; hostile to the imperial ideas of Germany, they had no sympathy with any national ideas for France. Nor is this strange, for France can hardly in any sense be said to have existed in their day. We have reached the time in which feudalism emerges from its earliest stages, and strives to lay the foundations of its independence. From the Treaty of Verdun in 843 to the accession of Hugh Capet in 987, France passes through a dreary and confused period of formation.

Charles the Bald.

Charles the Bald is a fit representative of such an age; he passed a long life sweeping together territories under his nominal sovereignty, and endeavoring to secure to himself the imperial dignity and the commanding position of his great namesake and grandfather; and though he was at the outset king of Neustria, his interests lay far more outside than inside France; the instincts and sympathies of Charles, as of all his family, were German. His schemes and struggles, rewarded in the end with apparent success,—for just before his death he was crowned king of Italy and emperor,—in reality were fatal to the Caroling dynasty. He bought his advancement first by subservience to the greater clergy, and afterwards by granting to the feudal lords the charter of their independence. After the Treaty of Verdun had apparently given to

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[1] Nithard, *Hist.*, iii. (ed. Pertz, pp. 38, 39).

843-875.

Charles the Bald undisputed lordship over the western portion of the empire, three states still resisted his authority:—Brittany, which, under Nomenoe, asserted and secured her independence; Septimania, which drove out his armies for a while; and Aquitaine, in which the vices of Pippin gave Charles a footing, and made a way to his success. For several years his whole energies were engaged in these bootless struggles, while at the same time his coasts were being ravaged by the Northmen. He was obliged to pay a heavy scot before he could deliver at one time the rich valley of the Somme, at another the walls of Paris herself, from their devastations. In a capitulary of 877, the last year of his reign, we have the levy of a contribution in order to buy them off from the Seine. In 855 the death of the emperor Hlothar was the signal for a fresh division of lands, in which Charles got his share in Lorraine and the kingdom of Provence. His fortunes, however, scarcely mended; overshadowed by nobles and bishops, his tenure of his kingly throne was ever precarious. The great lords, seeing in him a tendency towards resistance of their claims, called in German aid to dispossess him; and Ludwig the German came to their help. The inhabitants of Gaul, roused by the appearance on their soil of these German antagonists, rose and drove them back to the Rhine. Charles seized the opportunity of strengthening himself, as he hoped, by appealing to the church; the church by its spokesman, the great Hincmar of Rheims, replied by accepting the call, by declaring her authority over kings, and by tracing the lines of episcopal and royal power:—"If kings rule after God's will, they are subject to none; if they be great sinners, then is their judgment in the hands of the bishops." Hincmar, in these words, stretched wide the rule by which the clergy had claimed to exercise judicial functions in the case of ordinary malefactors. And thus the clergy rewarded themselves for having saved Charles from the hands of the nobles and the Germans. The reins of power were now entirely left in Hincmar's hands, and the dreary capitularies of the reign bear evidence in every page of the overwhelming influence of the clergy. Not satisfied with his supremacy in church and state, the great archbishop pressed forward into philosophical and theological controversy, and took his share in those discussions which heralded the incoming of scholasticism. He opposed the views and influence of John Scotus Erigena, the head of the palace school of Charles, and may be perhaps said to have given that direction to thought and speculation which marks in the main the course of the whole philosophy of the schools.

Towards the end of his reign there was only one prince, Ludwig the German, who shared with him the vast empire of Charles the Great. And in 875 on the death of Ludwig II., emperor and king of Italy, a handful of bishops and counts assembled at Pavia offered the imperial crown to both these princes. Charles arriving first was forthwith proclaimed "protector, lord, and king of Italy" by the pope. In the next year Ludwig the German also died, and Charles, not content with the imperial dignity, which he already possessed, nor with the ample extent of the territories nominally subject to him, desired to restore the old imperial unity, and to obtain the crown of Germany in addition to those of the west and south. The sons of Ludwig naturally resisted; and then, in order to secure the hearty aid of his followers, he held the diet of Quiersy-sur-Oise (Carisiacum) in which was drawn up the great capitulary sometimes styled the Magna Charta of French feudalism. Beneath a cumbrous covering of words, and connecting the hereditary succession of his own son with his large concessions to his nobles, Charles in fact conceded hereditary rights to all freeholders. Any lord who should desire to renounce the world might leave his benefices and honors to his son, or otherwise as might seem good to him; and any lord whose hold on his worldly goods was brought to an end by death might leave his dignity to his son (Baluze, *Capitularies,* ii. p. 259), and thus in definite terms the hereditary usage of centuries became hereditary right. Hitherto, in France at least, a fiefholder held at his lord's pleasure, and was, in theory, liable to deprivation at any time; henceforth, he was as secure in law as in fact, and could transmit his lands and dignities to his son without risk of loss. The title of duke or count is henceforth attached to one family; as the royal and the imperial power become weaker, the great families grow in strength; until a century of *fainéant* Carolings comes at last to an end, and their place is taken by the representative of one of the great houses, the duke of France and count of Paris. Then the new kingdom of France with its new capital will begin with Hugh Capet in 975. For the family of the counts of Paris had come to occupy the ground abandoned by the Carolings; they were the champions of the Gallic people against the Northmen. Only twenty-seven years after the death of Charles the Great, in 841, Rouen had fallen into Norman hands, opening the way for them up the rich Seine valley as far as to Paris. From that moment the city had no peace; and in 861 Charles the Bald invested a brave adventurer, Robert the Strong, with the county of Paris, and set him to resist the invaders. Bravely he struggled against them, and in the end gave up his life in defence of his people. In so doing he laid the foundations of the first French monarchy; his two sons were, to all practical intents, local kings of France; his great-grandson was Hugh Capet. Very different was the career of Charles the Bald. His famous order to his assembled lords, "Let each man defend himself in his fortress," with which high sanction for castle building and local independence he dismissed his feudal levies to shift for themselves, showed that the centre of power was completely gone. The king abandoned his people to any one who would defend them; their defenders rose to greatness, and the Caroling house sank into supine nothingness. Yet he still struggled, though in vain, against the sons of Ludwig the German; after an unsuccessful campaign in North Italy, death overtook him as he was recrossing the Mont Cenis pass (877).

875-893.

Louis his son succeeded him, the Louis II. of French historians, the "Stammerer." He had been for ten years king of Aquitaine, and, when he succeeded to his father's throne, found himself little but the slave and puppet of the great nobles. He soon died (879), leaving a kingship weakened and divided. His two sons, Louis III. in the north and Carloman in the south, were set on their thrones by the nobles, headed by Count Hugh, "first of abbots." These also soon died,—Louis in 882, Carloman in 884; and the representatives of the Caroling family were reduced to two princes of the name of Charles,—Charles the Fat, the emperor, son of Ludwig the German, and Charles "the Simple," "the Fool," a child of five years, youngest son of the stammering king. To the emperor fell the nominal sovereignty over the chief part of the Caroling territories. He, however, was incapable, lazy, a most degenerate shoot of the great house of Pippin. In France he did almost nothing; the Northmen scourged the land incessantly, and in 885-886 laid terrible siege to Paris. The citizens, led by their bishop Gozlin, by Hugh, "first of abbots" (for he was abbot of St. Martin at Tours as well as of St. Denis), and by Odo (or Eudes), count of Paris, made heroic and dauntless resistance. In vain did Hrolf the Northman press the town with active siege or dull blockade; the death of Gozlin and Hugh could not shake the fortitude of the defenders; Count Eudes repulsed attack after attack, and held his own. At last Charles the Fat appeared on Montmartre with a great host of Germans; and the Parisians hoped to see vengeance taken on their pagan foes. Charles the Fat, however, had none of their heroism; he contented himself with buying the Northmen off. As they retired, the citizens rushed out and inflicted one great blow on them, and the great siege was over. Charles withdrew into Germany, and in 887 was deposed and abandoned by all. He died the next year at Reichenau.

The Capetian line begins.

On his death in 888 the nobles of France, irritated against their half-foreign Caroling lords, chose Eudes, the stout defender of Paris, the elder son of Robert the Strong, as their king; he ruled over the land between the Meuse and the Loire, and was the forerunner of the Capetian line of princes, the first person who may be spoken of as a French king. The Carolings still spoke German, and had small love for France; the family of Robert the Strong was patriotic and vigorous, and had shown in the great siege that it might be trusted for defence. In the election of Eudes we see the victory of the feudal lords over the imperial or royal power; we feel that the Frankish name and influence are dying out, and that another set of lords and defenders is rising up to cope with the Northmen and to reduce the land into something like order. Eudes ruled from 888 to 893, striving manfully against the Northmen, whom he so far quelled

893-987. as to induce them to cease from their devastations of France, and to turn their arms against the English shores. He tried in vain to conquer the southern part of France, and after a long struggle was fain to leave them in their independence. Then the southern lords held a great assembly with the Caroling party of the north at Rheims in 893, and elected Charles the Simple their king. He placed himself under the protection of Arnulf, king of Germany, who formally invested him with the kingdom of France, and sent soldiers to assert his claims. This was quite natural; for in the eyes of the Carolings the head of the German branch was the head of the whole family; all other members of it were his vassals, them he protected, to him they swore allegiance. After a struggle of some years Eudes died, and Charles then became sole king of France. Robert, brother of Eudes, received the great title of duke of France; and these two personages headed the two parties, the Germanic Carolings and the French-speaking nobles.

Charles the Simple. Charles the Simple reigned undisturbed for many years: perhaps he was not altogether so foolish as his name declares him. In his day the Northmen, hitherto mere depredators, became permanent settlers in France. Everything there was so weak and defenceless that the invaders had only to choose; the miserable people, the old Celtic inhabitants of Gaul, welcomed their settling; it was a relief from the infinite woes under which the land was suffering. One band of Northmen established themselves on the Loire; another, under Hrolf, the fierce leader of the attack on Paris, settled at Rouen (911) and subdued all the country round, on both sides of the Seine. An orderly and strong government once more grew up in France, and Charles the Simple, advised by the churchmen, made terms with Hrolf, giving him his daughter Gisela to wife, and on due feudal tenure granting him the lands he had won by the sword (912). The stout pagan was baptized by the name of Robert; his followers, after their fashion, loyally did as he had done, and the history of Normandy began: Hrolf becomes Duke Robert, his people become Frenchmen. The duchy soon grew into a compact and orderly state, prosperous and vigorous; Norman towns and churches sprang up on all hands, French manners and speech soon ruled supreme, and in all the arts of peace, in building, commerce, letters, the Normans forthwith took the lead. The noble Scandinavian race, destined to influence so large a portion of the world's history, herein made worthy mark on the soil and the institutions of France.

Soon after this time the French lords, headed by Robert, duke of France, the "king of the barons," second son of Robert the Strong, rose against their Caroling king, and shut him up in Laon, the last stronghold of his family; thence he fled into Lorraine. On the death of Robert, the barons made Rodolf of Burgundy their king, and continued the strife; and Charles, falling into the hands of Hubert of Vermandois, was held by him as a hostage till his death in 929. Rodolf then became undisturbed king till he too died in 936. The barons under the guidance of Hugh "the White" or "the Great," son of Robert, the greatest man of his age, sent over to England for Louis, son of Charles, who had been carried thither by his mother for safety. This is that "Louis d'Outremer," "Louis from Over-sea," who now became king; after showing unusual vigor in a struggle with Otho the Great of Germany, who claimed the kingship over France, he was recognized by all in 941. His reign could be nothing but the miserable record of a struggle against the great lords, Hugh the Great and Richard of Normandy. In this perpetual and wearisome strife he spent his latter days, and died, still a young man, in 954. He was the only man of energy among all the later Carolings. His son Lothair succeeded; his was a long and inglorious reign, ending in 986. His son Louis followed, ruling for a single year. He died childless in 987; and the only heir to the throne—if the feudal lords chose to recognize an hereditary claim—was his uncle Charles, duke of Lorraine. The barons did not choose to be so tied; they set the Caroling prince aside, and elected Hugh, duke of France, to be king. He was afterwards solemnly crowned at Rheims by Archbishop Adalberon.

Thus did Hugh Capet, founder of a great dynasty, come to the throne. With him begins the true history of the kingdom of France; we have reached the epoch of the feudal monarchy.

II. The Feudal Monarchy.

987-996. Hugh Capet, first true king of France. Hugh Capet, eldest son of Hugh the Great, duke of France, was but a Neustrian noble when he was elected king. The house of the Carolings was entirely set aside, its claims and rights denied, by the new force now growing up, the force of feudalism. The head of the barons should be one of themselves; he should stand clear of the imperial ideas and ambitions which had ruled the conduct of his predecessors; he should be a Frenchman in speech and birth and thought, and not a German; but, above all, he must be strong enough to hold his own. And among the great lords of northern France, the representative of the house of Robert the Strong held the most central position, and united in himself most elements of strength. His lands lay between the Burgundians and the Normans, and stretched, north and south, from Flanders to Aquitaine. Not so long ago the duke of France had been the champion of the whole land against the invasions of the Northmen, and the successful defence of Paris had assured to the duke that position of protector of French interests which passed naturally into a kingship. The connections of the house were also a great source of strength; the duke was abbot of St. Martin near Tours, the spiritual lord of the Loire, and abbot of St. Denis near Paris, the spiritual lord of the Seine. And not only in connection with the church was he strong; his alliances with the lay-lords were equally fortunate. The lesser barons looked up to him; he was brother to Eudes Henry, duke of Burgundy, on the one side, and Richard the Fearless, duke of Normandy, on the other side, was his brother-in-law. Lastly, his was a compact and central territory: he was feudal lord of all Picardy, and held a large part of Champagne; Paris, Orleans, Chartres, the counties of Blois, Perche, Tours, Maine, were also his. The domains of the dukes of France formed a long and rather narrow strip; the western border running nearly north and south, touched the sea just above the mouth of the Somme, and reached the Loire a little below Orleans. Paris was as nearly as might be the centre of this district, which was bounded to the north by Flanders and Hainault, to the east by Champagne and a corner of Burgundy, to the south by Aquitaine, to the west by Normandy. The lords of these districts regarded themselves as at least the equals of the new king; the chief of them were the dukes of Normandy, Brittany, Burgundy, and Aquitaine, and the counts of Flanders, Champagne, and Vermandois.

The accession of Hugh to the throne was not undisputed. Charles of Lorraine, rightful heir to the Caroling throne, resisted him for a time, and was upheld by a formidable party among the nobles and churchmen. Their headquarters were at Laon, on the northern frontier of Hugh's domain; their strongest friend was William Fier-à-bras, duke of Aquitaine, on its southern limit. The hearty support of the Normans alone secured the new king's throne. After a short, sharp struggle, in which clerical treachery was as prominent as knightly valor, Hugh got his rival into his hands, and imprisoned him at Orleans, where he died. In a short time all the princes north of the Loire had recognized his authority. The clergy of his domains and territories looked up to him as their friend and champion, and willingly, as an end of strife, deposed Archbishop Arnulf of Rheims, who was nephew of the fallen Caroling prince, and elected in his room the famous Gerbert (afterwards pope as Sylvester II.), the most learned man of his age, who had dared to visit Saracenic Spain, and to bring thence to the north some of that science which gave him the fascinating reputation of being a sorcerer. He had been also in Italy, welcomed and rewarded by Otho the Great; he had taken the lead in the election of Hugh Capet. His elevation to the archbishopric of Rheims placed Hugh in direct antagonism to the papacy, and added much to the troubles of the king's life. And in truth his reign was a constant struggle; he won his kingly name with a life-time of anxious work, and with loss of much of his own domain, which he had to grant out as rewards to the faithfulness of his followers. At the time of his death in 996 it looked as if he was a weaker man than he had been nine years before. The Norman and Aquitanian dukes were stronger than he was, stronger than they themselves had been nine years before; in Burgundy his brother's power was little more than a nominal lordship; the eastern frontier of France seemed to be split up into a chain of independent principalities.

996-1041.

Hereditary principle in France.

On the Christmas day after his election in 987, Hugh Capet had called together his friends at Orleans, and had persuaded them to elect his eldest son Robert as a joint-king. Himself king by the will of his peers, he clearly desired to give the new kingship the hereditary impress, and to secure it to his family; and it may be noticed that in no country has the strict law of hereditary succession been so potent as in France, overbearing, as it did in the extreme case of Henry IV., even the opposition which that prince aroused, and securing an unbroken male descent down to the Revolution.

Robert.

Robert succeeded as sole king in 996,—not a good exchange for the infant kingship. For if the vigorous Hugh was embarrassed by both friends and foes, Robert, with far more piety and far less force of character, seemed certain to be overwhelmed. For Robert "the Pious" or "the Debonair," was an easy kindly man, the delight of monkish chroniclers, endowed with all the charming and dangerous virtues which commend themselves in the man, and often prove fatal to the king. His was a long inglorious reign of twenty-five years,—a constant struggle, first with the church for his wife, afterwards with his barons for his existence.

His first wife had been his distant cousin. The papacy, which could do nothing against his father, forced him to put her away; and though he did so very reluctantly, he speedily took another wife, Constance of Aquitaine, politically an important alliance, though she led him but a wretched life. The followers who came with her from the south introduced new tastes and ideas into the ruder north, and were regarded with detestation by the clergy as effeminate and vicious foreigners. We note a national feeling springing up,—for nationality is nowhere so marked as in its hatreds; to the barons and clergy of the Seine the people of the Garonne were aliens. The opposition also which existed between feudal nobles and churchmen, and the oppressed people struggling for some liberty of action and belief, expressed itself in the futile rising of the peasantry in Normandy (997), and in the slaughter of the Manichæan heretics of Orleans. The whole country was also vexed with civil strife; the king had to contend with his masterful queen, backed by her rebellious sons Henry, heir to the throne, and Robert, duke of Burgundy; in Normandy Richard the Fearless died in 1027, leaving war between his sons; the successful brother Robert secured the dukedom, and, thanks to dark suspicions as to his methods, went by the title of "the Devil."

Henry I.

Robert I. died in 1031, to the great grief of his poor people, to whom, after his way, he had tried to be as a father. His son Henry, whom he had crowned as joint-king in 1017, succeeding to the throne, had to face the bitter hostility of his mother, and of the duke of Burgundy. The duke of Normandy, following the policy of his house, sided with the king, and, crushing the revolted barons on his flank and that of France, made his already terrible name a curse to central France. A peace was patched up by Fulk Nerra, count of Anjou; Robert was confined in his duchy of Burgundy, and ere long Constance, by dying, smoothed the way to tranquillity; the weak king gave in before the strong nature of Robert le Diable, and Normandy became the most powerful state in France. The condition of the whole country, scourged with incessant private war, and lacking all central authority, became so bad that the church at last intervened; in 1036 the "Peace of God" was proclaimed, and accepted in southern and eastern France; the bishops of Burgundy also did their best for peace, and at last the bishops of the north also followed their example. In 1041 was proclaimed the famous "Treuga Dei," the Truce of God, in which all fighting was forbidden from Thursday evening to Monday morning, on all feast days, in Advent and in Lent; religion thus endeavored to extend her protection over almost all the year, and greatly mitigated, if it did not abolish, the evils of private warfare. Many were the signs that some great change was coming. The terrors and hopes roused at the millennial year; those feelings renewed and strengthened, only to be disappointed, at the date of the thousandth year from the crucifixion of our Lord; the fearful contrast between the famine and misery desolating France and the brilliant dreams of the coming kingdom of the just; the slow but real entry of Oriental learning into the west of Europe; the steady set of a stream of pilgrims toward the Holy Land, pre-eminent among whom was Robert of Normandy; the renewal of Norman adventure and conquest, specially in southern Italy; the establishment of the ascendency of monasticism with its champion Hildebrand at Rome, and its renewed vigor in both France and Germany,—all these things mark the reign of Henry I. as a time of preparation for the world's struggle that was coming, for the terrible strife of Christian and Saracen over the holy places of Palestine. The conquest of Sicily and southern Italy, as well as that of England a few years later, made the Normans the foremost champions of the papacy, and the leading power in Europe.

1059-1096.

During these years the kingship of France was in very unworthy hands: Robert, weak and pious, had done nothing to strengthen his throne; his son Henry, immersed in petty warfare, fared no better, and feeling his end to be drawing near, in 1059 had his son Philip crowned as joint-king with himself. He died in 1060, leaving his throne to a prince weaker even than himself. The contrast between these petty kings of France and the grim dukes of Normandy must strike every one: Richard the Fearless, Robert the Devil, William the Conqueror, colossal figures, strong and fierce, take all the sunlight from gentle Robert, weak Henry, dissolute Philip, kings of France. And, in fact, a history of France which should take account only of her kings and their reigns would be completely delusive; the royal power is felt in this 11th century over a very small part of the surface of the country; the great lords are stronger by far than the king in their midst. Normandy rises to very great eminence; Aquitaine is fairly consolidated into a strong southern power; though towards the east the more Germanic princes split the land into petty lordships, the two Lorraines are sometimes under one duke; on the other side Brittany was entirely independent. Across the whole northern frontier the German influence was supreme. Philip was little able to cope with these antagonists. He made an attempt, which failed, to secure Flanders; he withstood William the Bastard in 1076, and made peace with him; and when, after the Conqueror's death, Norman and English interests were somewhat parted, the dangers of a Norman ascendency over France diminished. Somewhat later (1094) Philip was involved in a contest with Rome, the church being now the champion of Fulk of Anjou, whom the king had wronged by carrying off his wife,—a struggle as honorable for the papacy as it was discreditable to Philip. The church, however, was not now led by the mighty hand of Hildebrand. Gregory VII. had died in 1085, and in the reaction which followed, it looked as if the papacy itself might fall. Germany, ever protesting, opposed its claims, often with an anti-pope of her own; the French king, a weak man, with a wretched cause, was yet able to defy the pontiff; William the Bastard, even in Hildebrand's days, had refused to acknowledge his claims; the Normans in Italy were at best but turbulent friends; the Saracen was still a threatening neighbor. In these dark, cloudy times the papacy, by a wise instinct, took for its motto the ancient "ex Oriente lux," and placed itself in the van of that general movement which led to the crusades. The pope who took the great step was Urban II., a Frenchman by birth; it seemed to him that if he could stir the warm blood of turbulent French nobles, and the sterner valor of the Norman character he might head a holy enterprise, and so doing deliver the papacy from all its difficulties, and perhaps assert its lordship over the world.

Philip I.

The crusades.

Urban crossed the Alps in 1095, and came to Clermont in Auvergne. There he was in a central position, within reach of both southern and northern France, and yet not within the domain of the excommunicated Philip, sitting sulkily at Paris. The pope's famous sermon at the council, though at the moment it seemed to fall flat on princely ears, set the crusades in motion, and was the prelude to great events, great changes in Asia and Europe. France took the foremost part in the movement; she seemed to lead the half-formed nations of Europe in the common enterprise; her great men are the heroes of the epoch; "the crusades," says Michelet, "had their ideal in two Frenchmen; they are begun by Godfrey of Bouillon [who, however, was not strictly a Frenchman], and Saint Louis closes them." The latent uneasiness and misery of the people needed only the call; a countless multitude of the common folk flocked to the banner of Peter the Hermit. The excitement went on increasing throughout the year 1096, and as it slowly

1096-1100. gathered force and form, bystanders must have looked with amazement at the strange materials out of which so great a movement grew. The first crusade was altogether popular in character; there was in it little of knowledge or discipline; it was rather like those instinctive emigrations which, flowing from the north or east from time to time, have overwhelmed the more civilized portions of the world. In the pope's sermon at Clermont there was a striking passage which contrasted the wretchedness of men's daily life in France with the comfort of the "land flowing with milk and honey" towards which he directed their eyes. Religious enthusiasm joined with present misery; the dream of a millennial home in Palestine instead of famine and pestilence in France—here is the force which set the first army moving towards the East. And, naturally enough, that first army was almost entirely composed of the common people; the feudal lord felt none of the stings of want, and as yet had no interest in Eastern adventure.

The first crusade. The vast throng of crusaders who set off eastwards in the summer of 1096 was divided into three hosts. The van was led by the one soldier of the company, Walter the Pennyless,—he had at his back about fifteen thousand footmen; the main body of French pilgrims, led by Peter the Hermit, followed next; then came a rabble of German peasants, under the guidance of Godescalc, a monk; on the skirts of the whole force hung an independent body of horsemen. A small band of Norman knights alone saved this crusade from absolute contempt. With great loss the host traversed Europe and were put across the Bosphorus by the emperor Alexius. There they met the Turk at last, and found him more than their match. The energy of Kilidg Arslan, the sultan of Nicæa, soon destroyed them all; they perished far from the walls of Jerusalem.

Meanwhile the interest in the holy places was far from growing less in France. It at last attracted the attention of the lord as well as of the vassal, and the second expedition promised to be very different from the first. Like the first, it was also divided into three hosts,—a northern, a central, and a southern. The northern army was composed of Flemings and Lorrainers, under command of Godfrey of Bouillon, duke of Lower Lorraine, a Caroling prince; it had little or no French blood in it. The central army was French, Norman, and Burgundian, headed by Hugh, count of Vermandois, King Philip's brother, who commanded the Frenchmen; by Robert, duke of Normandy, leading Englishmen and Normans; by Alan of Brittany, with his Celtic following; and by Stephen of Blois, head of that powerful house, who had espoused Adela, the daughter of William the Bastard, and was father of Stephen afterwards king of England. The third army, by far the most complete and best equipped, was composed of the southerners subject to Raymond of Toulouse. The Italian Normans, under Tancred and Bohemond, set forth by themselves. These all, by sea or land, converged on Constantinople, and great was the anxiety of Alexius, who had but one wish, that he might see them safely across the narrow strait which severs Europe from Asia. At last they were all passed over; and William of Tyre declares that at a great muster held on the Asiatic shore there stood forth seven hundred thousand men in all. The figures may be extravagant; there is no doubt that the host was vast and strong. And so Kilidg Arslan found it. He attacked them again and again as they moved southwards through Asia Minor; but they defeated and crippled him so that he could not stay their advance. They reached Antioch, and took it after a long siege and fierce fighting, which broke the power of the Seljukian Turks. They left Bohemond the Norman as prince of Antioch, and marched onwards. Baldwin, Godfrey's brother, moving eastward to succor the Christian lord of Edessa, took the place for himself, and founded the Frankish county of Edessa in 1097. The main body, reduced by many causes to about forty thousand warriors, reached Jerusalem, and after a desperate siege, signalized by prodigies of valor, stormed the holy city on the 15th of July, 1099. The crusaders at once elected Godfrey of Bouillon king of Jerusalem; and though he did not accept so sacred a title, he became lord of the holy city, and the Latin kingdom of Jerusalem began. So long as he lived, he ruled with vigor and success; and the year 1100 seemed to have almost fulfilled the millennial hopes which had been so bright a century before. The battle of Antioch in 1098 had broken the Seljukian power; that of Ascalon in 1099 checked the Fatimites; and Godfrey seemed likely to found a permanent 1100. Christian lordship in the East. But death soon closed his career, and the organization of the great conquest was left to others. Four Latin principalities, Jerusalem, Tripolis, Antioch, and Edessa, were formed, and arranged on the strictest principles of conscious feudalism: the new kingdom of Jerusalem held only of the papacy.

At home the French monarchy was far from quiet, indolent Philip being threatened by the vigorous attack of William II. of England, who claimed once more the French Vexin, and also made war on the count of Maine. In this obscure warfare Philip's eldest son Louis, to whom was entrusted the defence of the western frontier, showed ample promise of his vigor, though it was the arrow in the New Forest which in 1100 relieved the French king of all fear of his rival. Henry Beauclerc, the Conqueror's youngest son, succeeded William in England, and before long (1106) had conquered and captured at Tinchebray his elder brother Robert Courthose, the crusading duke of Normandy. Under his capable government England and Normandy enjoyed repose and prosperity.

When it was known in the West that Godfrey of Bouillon was dead, and that the infant kingdom of Jerusalem was in danger, William IX. of Aquitaine, who, now that Raymond of Toulouse had settled at Tripolis, had become the foremost prince of southern France, set forth with new levies to the succor of the cause. He was joined by some few northern barons, one of whom, Herpin of Bourges, sold his lordship to Philip of France, and began that transfer of feudal territory which was of the highest service to the kingly power. With Bourges the French monarchy for the first time got footing on the south bank of the Loire. The expedition failed ignominiously; William came home to Aquitaine almost alone; and an attempt made somewhat later by Bohemond of Antioch on Constantinople itself came also to nothing. With these two failures the first crusade ended. As yet its effects on France could hardly be felt; the papacy alone was at first seen to be a gainer by the movement. For the new and rigid feudalism of Jerusalem, with its hierarchy of lords, and its code of justice, the famous Assises, all eventually looked to the papacy as its head. While the Western monarchs all strove against the pope, the pope was the sole support and undisputed master of the monarchy of the East. In one respect this first crusade is specially interesting to France; her language, newly assured of independent life, no longer a patois or a dialect of the common Latin, received fresh recognition, and spread abroad in the world. As Latin was the common speech of the church, so French became the common speech of warlike Christendom. It had been carried by the Normans into England and Sicily; now it was the recognized tongue of the Latinized East; and from this time onward it was adopted as the language of feudal and political life.

Louis VI. In the year 1100 Philip, following the traditional usage of his house, had made his son Louis joint-king, and put off the burdens of his royalty. The young man, full of vigor and a true king, had a hard struggle at the first; the limits of the royal power were very narrow; Louis is said to have built the greater Châtelet at Paris as a defence against the neighboring lord of Montmorency, who disputed with him the mastership over the plain of St. Denis; on the other side, he had much ado to come by the castle of Montleheri, which barred his way southwards to Orleans; his mastery over his own barons was very slight; his suzerainty in districts farther off, over Champagne and Burgundy, over Normandy and elsewhere, was scarcely more than nominal. But Louis had force of character; his nicknames testify thereto, for was he not styled "the Eveillé, the Wideawake," and "the Batailleur, the Bruiser"? He knew how to rouse enthusiasm among his followers; no prince ever had a more loyal household or a stronger; the crusades relieved him of some of his most turbulent neighbors; the upspringing of the communes, with their civic liberties, afforded a counterpoise to the feudal violence of the baron's castle; above all, the royal domains under him were well administered. First of Capetian kings, he was felt to be the fount of justice, and it was seen that, as his wise biographer Suger says, "he studied the peace and comfort of ploughmen, laborers, and poor folk, a thing long unwonted," and all the more grateful for its novelty. The most marked of these charac-

1100-1131. teristics of King Louis VI.'s reign was the growth of town liberties, which began just before and after the year 1100. France has always been remarkable for the large number of her small towns and her deficiency in large ones; the time we have reached gives us the beginning of this phenomenon. The little towns all through central France now became the refuge of the population against feudal lawlessness and oppression; and in the very centre, in the district round Paris, they took up the defence of the royal power against its most dangerous feudal neighbor, the duke of Normandy. "At this period," says Ordericus Vitalis, "popular communities were established by the bishops, in such sort that parish priests accompanied the king to siege or battle, bearing the parish flag, and followed by all the youth of the township." This movement showed itself most clearly in the towns just to the north of Paris. Laon, Noyon, Beauvais, the three seats of the clerical party, Saint Quentin, and a few others, all at this time bargained for and bought their liberties. The king placed himself at their head. As each parish priest, representing some little town, marched with the banner of that saint to whom his church was dedicated, so did King Louis go forth with the flag of his own church, the oriflamme of St. Denis. He is the first king of France who bore it officially; by it he declared himself champion of the Church of France, and of the new burgher-life which was springing up around him. The peasant also was glad to be on the same side. In the king's struggle against feudal independence we see continually how well he was seconded by the aggrieved rustics as well as by the civic levies, or by the "damsels," the young gentlemen who formed his warlike court. It would be misleading to say that this new burgher-life was the king's doing; he seems to have felt but little interest in it, great as was its influence on the future. He granted and withdrew charters according as it suited him, or as men offered him more or less. Even to the larger towns, the chief cities of the royal domain, Paris, Orleans, Melun, Étampes, and Compiègne, he only granted privileges, not any real constitutional rights. It is one of the misfortunes of French history that constitutional liberties never seem possible,—that even in the outset they are blighted, and in the end they perish.

By degrees Louis VI. secured his frontiers to the east, the north, and the south; with the west, where lay the fiercer Norman, it was a harder task. In 1119 he lost the battle of Brenneville, and had to abandon the cause of William Clito, son of Robert duke of Normandy, who claimed the duchy against Henry I. of England. In 1124 he was once more in collision with his Norman neighbor; for Henry Beauclerc had allied himself with his son-in-law Henry V. of Germany, who promised to attack the French king from the east, while Henry I. should assault him in the west. Louis VI. raised all central France to the rescue; it was seen how powerful he had become. His own men came in at once, and formed the nucleus of his army; his body-guard and the men of Paris, Orleans, and Étampes were in the centre round the sacred oriflamme, which Louis now brought forth for the first time. Champagne and Burgundy were there; Vermandois also with horse and foot; Pontoise, Amiens, and Beauvais sent the men of their communes. The greater lords farther off, though they held back, did not contest the king's right to call them out. The emperor, struck by this show of energy, or aware of troubles behind his back in Germany, abandoned all his plans of revenge against Rheims, where the council of French clergy had excommunicated him. The king soon made peace with Henry of England, and the storm passed over.

The fortunate issue of this war, and the king's interposition in the affairs of his neighbors, the submission of William of Aquitaine to his judgment, his attempt to find a lordship in Flanders for his friend William Clito, marked Louis VI. out as a powerful king, who had in fact triumphed over opposition at home and abroad. He followed precedent, and had Philip his eldest son crowned in 1129; he, however, was killed by accident in 1131, and the king then took his younger son Louis, "Louis the Young," as men called him, and crowned him as joint-king. The troubles of England, connected with the reign of Stephen, relieved him of anxiety for the rest of his days on his western borders; and the offer of William of Aquitaine to wed his daughter Eleanor to the young joint-king seemed to promise the happiest future for France. Louis VI. just lived to arrange the marriage, and then, on his way to St. Denis, where he yearned to end his days, for it was the school of his youth and the home of Abbot Suger his dearest friend, he was taken ill at Paris, and there died in the year 1137. 1137-1147.

This was the first real king of France, a man of noble nature and true kingly gifts. His greatest cross was his unwieldy bulk, though it could not hinder his activity; he was of humble heart and kindly, cheerful in health or sickness, a true father to his people. Had his successor been a man like himself, the task of welding France into one kingdom might have been achieved centuries ere it was at last brought to pass.

Louis VII.

But Louis VII., the Young, and his queen Eleanor of Aquitaine, left by her father's death at this same time heiress of his great possessions in the south, were far below the level of the fat king, and retarded instead of forwarding the growth of the French monarchy. The advance of the country in mental and material prosperity during the late reign had been immense. Thanks to the crusades, and to the tranquillity which prevailed at home, town-life flourished, religion woke to new life, church-building took a fresh departure, philosophy began to feel her strength. If these are the days of St. Bernard, last of fathers, they were also the days of Abélard, one of the first of intellectual inquirers. To him is due the mental reputation of Paris, which in its turn led on at the end of the century to the establishment of the university of Paris, mother of all the learned corporations of modern Europe.

The second crusade.

The abbot Suger.

Louis VII. was no sooner sole king than he began to show how far he was below his great father; he was weak, timid before the church, vexed with a scrupulous conscience, the delight of monkish chroniclers, the contempt of men. From the beginning his ventures failed. He tried to coerce the great count of Toulouse into submission, and was ignominiously repulsed; he carried on a quarrel with the papacy over the cathedral at Bourges; declared, with Suger's support, that he had the right to nominate to that archbishopric; found Theobald count of Champagne for his own purposes opposed to him; attacked him impetuously, and burnt down Vitry church, in which a crowd of poor folk had taken refuge. The village bears in consequence to this day the name of Vitry le Brûlé, the Burnt. Then, stung with remorse, he gave way before the pope, who enjoined on him a crusade as a penance. In vain did the prudent and patriotic Suger oppose the royal impulse. Weak and excitable, the young king could not be held; the passionate appeals of St. Bernard were far more to his taste. It is interesting to note these two great and rival churchmen pitted against one another: St. Bernard champion of the universal lordship of the papacy, Suger endeavoring to defend the independence of the French monarchy. St. Bernard was the life of the movement; he was, however, too prudent to undertake the leading of it; he would provide the impulse, others must shape it to its end. In this crusade (1147) Germany preceded France, and the expeditions were headed by Conrad the emperor, and by the French king, who entrusted the charge of his country to his old preceptor Suger, although he would not follow his advice. This great churchman, a little man, weakly and thin, was of obscure and ignoble origin; he was educated at St. Denis, side by side with the good king Louis VI., and afterwards appointed abbot of that famous church. While St. Bernard represented patristic learning, and Abélard Greek philosophy, Suger was noted as a diligent student of holy scripture. He was the trusted adviser of both Louis VI. and Louis VII., and by his conduct as regent justified their confidence, and earned the name of Pater Patriæ. He has left in his writings more than one proof of his interest in the well-being of the French people, and of their wretchedness under their feudal masters,—one village "under the lord's castle trodden down and as miserable as if it were under Saracen oppression;" another, "subject to three talliages,—almost entirely destitute through the rapacity of its masters;" another, "so ravaged by the lord that it became utterly unfruitful and useless;" or again, in a fourth place, "the poor folk could scarce exist under the burden of so wicked an oppression." Under Suger's eye prosperity in part came back; but he could not hinder the failure of the crusading king, whose career in the East was a discredit and calamity. It alienated Queen Eleanor, lost him south-

1149-1180.

ern France, made him the contempt of his subjects. In 1149 he returned home with the merest fragment of an army, and Suger humbly withdrew from public life to St. Denis, spending the remnant of his days in good works and wise reforms within that narrower sphere.

The fortunes of Henry II.

At once Queen Eleanor sent to the pope for a divorce, and Louis VII. made but a half-hearted opposition, for she was in truth far too proud and vehement for him. The pope granted her wish in 1152, and immediately after Henry of Anjou wooed and won her, becoming thereby the strongest prince in France. The king tried in vain to make a league against him. Henry compelled all his foes to make peace with him, and became lord over France from the Norman frontier across to the Gulf of Lyons. In 1154 he ascended the English throne as Henry II. Vigorous and determined, fortunate in his marriage, his own resources, his kingship in England, it seemed certain that he would overthrow his feeble rival, and wear on his head the two crowns of France and England. Forthwith began the struggle which lasted all his life. He made Rouen his chief and favorite capital,—for he was far less English than French,—attempted Toulouse, attacked the Bretons, reduced Louis VII. to peace, getting Margaret the daughter of Louis as wife for his eldest son Henry. She brought him some frontier castles, which much strengthened his hold on Normandy. By about the year 1160 Henry II. had reached the highest limit of his almost imperial power. He had planted out his sons as vassal kings in Normandy, Anjou, Ireland; he completely overshadowed all the other princes of Europe. It was not till he tried to restrain the clergy that his troubles began. The Constitutions of Clarendon were passed in 1164; the quarrel with Becket did not tarry. The French king gladly supported Henry's foe, and the struggle lasted till Becket's murder in 1172, a crime which was fatal to the fortunes of Henry II. In 1172 Eleanor, deeming herself wronged by her spouse, set her Aquitanians in revolt against him; her sons also joined her, and Louis VII. entered once more into the strife. He was soon taught that it was folly for him to measure swords with Henry; the great Angevin monarch held firm hold of all his Continental possessions.

Then Louis in 1179, feeling himself old, caused his son Philip, then aged fifteen, to be crowned as joint-king. At the coronation of Philip Augustus at Rheims it is said that the twelve peers of France,—six laymen, six ecclesiastics,—were all present. They were the dukes of Normandy, Burgundy, and Guienne, the counts of Flanders, Champagne, and Toulouse, the archbishop of Rheims, and the bishops of Laon, Noyon, Chalons, Beauvais, and Langres.

This was the last act of this long-reigning prince, who died in 1180. He had been sole king since 1137, and in the main had done little harm if little good. He was kindly and pious, learned beyond the princes of his age; and so long as he listened to the sage counsels of Suger he reigned not amiss. In his days agriculture largely improved, lands were brought under tillage, the countryman had peace and felt some sunshine of prosperity; the lesser towns also flourished, for Louis VII. was friendly on the whole to the communal advance, and issued no less than twenty-four civic charters. His greatest misfortune was his spouse, his greatest blunder his crusade; for a weak well-meaning man, it is wonderful how little harm he did. As so often occurs in history, he is the mean prince between two great men; we are obliged to contrast him with Louis VI., his active and able father, and with Philip Augustus, his proud, unscrupulous, and vigorous son. It is under these three princes that the French feudal monarchy takes definite shape.

Philip Augustus.

Philip Augustus, cold and patient, proud and firm, without high impulses, lacking in enthusiasm, ungenerous, sometimes even deceitful and mean, a hard man and terrible rather than noble, a man who trusted in law and cared little for justice, was clearly a formidable person. His reign of forty-three years—just the same in length with that of his father—could not fail to have great influence on the fortunes of his country. History must favor him: the contrasts, "Louis the Young," his father, and John Lackland of England, are all entirely in his favor; the rivalry between the houses of Capet and Anjou turned to his advantage; the sum of results in his reign leaves on us the sense of greatness and strength, supported by good fortune.

1182-1199.

Philip Augustus began his long reign with acts of vigor and severity. His gentler father could not be persuaded to touch the Jews: but Philip banished them from the realm in 1182; he issued edicts, which he also enforced, against vices, and against heretics; in all he showed signs of a strong and unpleasant character. In 1185 he began with his neighbors,—had a little war with the count of Flanders, which won him the county of Vermandois and the border city of Amiens, key of the line of the Somme. Next, he fell to blows with the duke of Burgundy, and reduced him to submission. In 1186 we find him holding peaceful discussions with his most formidable neighbor, the duke of Normandy, and beginning a movement which after long years ended in the annexation of the proud duchy to the kingdom. Richard Cœur de Lion was too turbulent a prince to let things long remain at peace. Disputes sprang up as to frontier districts, such as the Vexin, and as to the falling-in of the Breton dukedom. Sometimes with Henry II., sometimes with his rebellious son, Philip was constantly conferring or quarrelling, though the grandeur of the old king of England overawed his young rival, whose policy with respect to him looks to us timid and irresolute, and sometimes mean. So things went on till 1187, when tidings of the fall of Jerusalem seemed to still all lesser controversy; and Philip and Henry, meeting once more under the Gisors oak, made peace and took the cross. All Europe was stirred into action; the emperor Frederick Barbarossa and the chief German dukes, Richard Cœur de Lion, with all the greater lords and barons, prepared to set forth. But ere they went troubles again broke out between the two kings, and Henry, deserted by his sons, was forced to a shameful peace, which involved the cession of Berri to France, and involved also the death of the broken-hearted monarch (1189).

With the death of Henry II. we feel that we have passed the highest point in the fortunes of the house of Anjou, and that now the Capets must prevail in France.

The third crusade.

Now followed the third crusade, which brought much barren glory to the new king of England, which caused the death of Barbarossa, drowned in the little river Cydnus (Carasu) in Cilicia, which added nothing to the honor or the power of Philip Augustus. He saw the taking of Ptolemais, and ere long, wearying of the uncongenial sport, handed over his Frenchmen to his kinsman the duke of Burgundy, and, swearing not to molest Richard's territories, set sail for Europe. He broke his word at once by allying himself with John, and fanning that mean prince's jealousy of his nephew Arthur of Brittany. When tidings reached Philip that Richard had been taken prisoner by Leopold of Austria, the French king did not hesitate at once to take advantage of his misfortune. He attacked Normandy, and, in concert with John, laid siege to Rouen. When, however, the emperor let Richard go free, his onward course was checked, and the war ended by a truce, Philip becoming master of Auvergne and withdrawing his hand from Normandy (1196). Richard at once did his best to raise up obstacles against him. Now rose the noble walls of Château Gaillard to protect Rouen, which, since Gisors had returned to France, was entirely open towards the east. For a while his warlike genius and skill in fortification seemed to check the French king's ambition. His end, however, was at hand; besieging Chalus, he was wounded by an arrow, and the wound was fatal. He died in 1199, leaving his crown to his brother John, whose weakness was sure to be Philip's opportunity. Of all the great house of Anjou none remained save John and little Arthur of Brittany; it was clear that ill-will must spring up between these two princes, and what so clear as that Philip would be ready to pluck advantage from the quarrel? At once, on John's accession, while England and Normandy accepted him, the other French-speaking districts, Anjou, Maine, Poitou, and Touraine, as well as Brittany, declared for Arthur, and placed themselves under the willing protection of Philip, who suggested a fair division—the French-speaking lands, including Normandy, for Arthur, England for King John. It was clearly impossible that John, with his un-English character and bringing up, should accept banishment to the island; war broke out, and Philip, in Arthur's name, seized on Brittany, and presently making peace with John, abandoned Arthur's cause. He made his profit out of the short war and peace, no doubt; but the true reason for his peaceable humor was his controversy with the pope, who had interfered with him over the old royal difficulty, his wife. Philip had sent away Ingeborg, his Danish queen, and had taken the fair Agnes of Meran. The pope, Innocent III., came to the rescue of the wronged lady, threatening Philip with excommunication and France with interdict. In 1200 he carried out his threat. The proud king struggled a while against papal interference; in the end he found it better to yield, and replaced Ingeborg on his throne. He was now ready to interpose once more between King John and hapless Arthur. In 1202 John gave him the chance. Arthur fell into his uncle's hands, was lodged in the castle at Rouen, and from that day vanished from life and history. His subjects at once rose in his behalf, and Philip marched southwards into Poitou. Having there secured his authority as Arthur's avenger, he turned north again and swiftly fell on Normandy. In the autumn of 1203 he laid siege to Château Gaillard, then defended by Roger de Lacy, constable of Chester. In vain did Innocent III. interfere between the kings. Philip now had justice and an outraged people on his side, and soon showed the pope that his intervention would not be allowed. Early in 1204 the great fortress fell. John, who had done nothing to avert the blow, had actually fled from his capital Rouen to England; from that day onward the centre of the kingdom was destined to be at London; the controversy for precedence between England and Normandy on that day came to an end. Philip passed triumphantly through Normandy. Poitou, Touraine, Anjou, also placed themselves in his hand, and King John retained a few places near the coast, with Rochelle as his one port of entry into France. Brittany, hitherto a fief of Normandy, henceforth must pay homage to the conqueror of that duchy.

The Albigensian crusade.

The next decade of years was marked by the beginning of great troubles in the south. There flourished sciences, literature, the arts; there men thought and spoke as they would; there the Jew and the infidel could live side by side with the Christian; there the church was weak and feudalism had no hold. The earlier efforts of Innocent III. bearing little fruit, in 1208 his vengeance fell on Raymond of Toulouse, and the Albigensian crusade began. The pope called on the French to help; and, though Philip himself did not interfere, he did not hinder crowds of his ecclesiastics and lay lords from taking the cross. Under the command of St. Dominic, the spiritual power plied its merciless arms; led by Simon of Montfort the elder, the lay sword vigorously supported the thunders of the church. Languedoc was laid waste, her fair culture trodden in the dust, her ancient cities, centres of civilization, burnt and ravaged. No war was ever more atrocious; the grim fanaticism of Simon ably seconded the pitiless orthodoxy of Dominic. The war raged till 1212, when Raymond was forced to flee into Aragon, while Montfort seemed certain to found for himself a great southern principality. The attempt of Peter of Aragon to drive him out, and to keep back the northerner from his borders, ended in that prince's defeat and death, and by 1215 Simon was lord of almost all the south; the great Lateran Council held in that year, confirmed him and his crusaders in possession of it. The two Raymonds of Toulouse, father and son, now made yet one more effort; the south was weary of the foreign invader, and made common cause with them; Toulouse rose against Simon, and in the siege which followed he was killed (1217). Philip now interfered at last, with an army reinforcing Amaury, Simon's son; the heroic south resisted gallantly, and the elder Raymond was able to bequeath his whole inheritance to his son. For a few years the invader and the persecutor were driven out of the land.

Meanwhile Philip had not been idle; the crusade was doing his work in the south, and the incapacity of King John of England gave him an opening in the north. In both he showed himself as the chief friend of the papacy; but while in the south he mainly contented himself with passive approval till towards the end of the struggle, in the north he set himself to take an active part, and in 1213 called an assembly of barons at Soissons, to prepare for an invasion of England. From this, however, he was stayed by Pandulf, the pope's legate, and turned his hand instead against Ferrand of Flanders, who had refused to obey his summons. His fleet, sent up to occupy the mouth of the Scheldt, was attacked and ruined by English ships, and Philip got but a poor consolation by pillaging some of the wealthy Flemish cities. In 1214 he had to face a grand coalition of enemies. Ferrand was supported on one hand by the king of England, on the other by the emperor Otho,—the former undertaking to attack Poitou, the latter to enter Flanders. The moment was very critical for Philip; his barons went in heart with the feudal lords against their royal master. John, however, though he landed at La Rochelle and took Angers, fell back on the first resistance, and was of no avail. Otho entered Flanders, and Philip came up to meet him. They met at Bouvines (29th Aug., 1214), and there Philip won a great victory over Flemings, Germans, and English. Otho fled, a ruined man; Ferrand of Flanders, the earl of Salisbury, and Renaud of Boulogne were prisoners. To the battle of Bouvines are due on the one hand the firm establishment of the French monarchy, on the other the security of English baronial liberties by Magna Charta. Philip had now secured the west, weakened the south, and crushed the great coalition of the north. Little remained for him but to consolidate his power. He had sent his son Louis into England to support the barons against King John; when, however, John died the English barons and people refused to depose his son Henry III.; Louis had to withdraw to France.

Character of Philip Augustus.

For the remainder of his life Philip lived in peace, save when he interposed to support the northern invaders of the south of France. His government was wise and tranquil; he allied himself closely with the church throughout; and when he died in 1223 he left a large part of the fortune he had amassed to his clergy, while he took care to hand his great territories unbroken to his son Louis VIII.

Philip Augustus was, as has been said, "a great king, not a great man." His name survives to France in the memory of the fact that by conquering Normandy he made royalty great. He was also king of Paris, for he built the present Notre Dame, erected her market, paved and cleansed the streets, built almshouses, secured a good water-supply, strengthened her defences by making new walls around the city; above all, he sanctioned and supported, if he did not actually found, her university. To his action in this and to the abatement of grudges between France and England we owe it that the first of English universities, Oxford, drew her earliest inspiration from Paris, and was established in the main on the same lines. New branches of study were cultivated; medicine, experimental philosophy, and law began to occupy the minds of men. And Philip was, by character and knowledge of his position, a lawyer. If great men are noted for their passion for justice, great kings are irresistibly attracted towards law; and Philip, with his delight in the newly-revived Roman law, stands fair comparison with the "English Justinian," Edward I. For the Roman law provided high sanction for his kingly claims,—a sharp instrument for the punishing of popes and princes. The king's sagacity carried him safely through great crises of the fate of royalty, through his struggles with the papacy and with the powerful feudal princes. Besides Normandy and Brittany, Flanders, Champagne, and Languedoc had to bow before his authority; while he reduced the power of the great lords, he actually had the courage to give them a special organization by establishing the great court of peers, whom he called together to help him in condemning King John. Proud, cold, and sagacious, Philip is among the greatest of the founders of the later French royalty.

Louis VIII.

His successor Louis VIII. reigned only three years (1223–1226). In an attempt to carry out the wishes of the church in the south, and to crush the heretics, he was attacked by camp fever after the siege of Avignon. He died, leaving behind him a young son Louis, then twelve years old, under the care of his vigorous and ambitious widow Blanche of Castile. The early years of the reign of Louis IX. were spent in ceaseless strife. The great lords thought that they discerned in the accession of a child their watched-for opportunity; but the vigor of Queen Blanche, and the hearty support of Paris and the towns, made them accept the treaty of St. Aubin du Cormier in 1231; the king's position was secured, and his troubles came to an end. Henry III. of England, on whose aid the princes had depended, failed them, and they were fain to make the best terms they could. This struggle was followed by a long contest with the bishops, in which the young king learnt lessons which stood him in good stead; it is probably to this contest that he owed the successes of his later life,—that he was able, as few kings had been, to combine earnest devotion with an

Saint Louis.

1242-1249. absolute superiority to priestly rule and influence. In many ways circumstances proved friendly to the young king. Theobald of Champagne, becoming king of Navarre, sold some valuable fiefs to Louis; the Treaty of Meaux a little time before had closed the contest between north and south by the submission of Raymond VII., count of Toulouse; one after another the leading nobles ceased to compete with the crown. During all these early years of his reign Louis had constant help from the strong hand of his mother; imperious and masterful, she ruled him and the land thoroughly and successfully. He stood wisely clear of the great struggle which went on all these years between Frederick II. and the papacy.

In 1242 came the king's first serious warfare. He had tried to set his brother Alphonse over Poitou and Auvergne, whereon the reluctant nobles called in Henry III. to their help. Henry came with a small army and large supplies. Louis, however, hastened down to meet him, reduced all the country north of the Charente, defeated him twice, and that incompetent prince fell back to Bordeaux, where he wasted his time and means. In 1243 he was obliged to make his peace with Louis, and gladly withdrew to England. At this same time, Raymond VII. also rose against the king; he was, however, soon reduced to order. In 1244 the last of the Albigensians perished at Mont Segur, the whole of them preferring to be burnt rather than retract their opinions. Fitly to end this period of his life, Louis IX. issued an edict that no lord should hold fiefs under both the king of France and the king of England; almost all his lords abandoned their English allegiance, and rallied round him alone. This movement made the distinction between English and French feeling stronger, and rendered the wars of the future more really national. In 1245 Charles of Anjou, the king's brother, wedded the great heiress of the south, the Countess Beatrice. This fortunate marriage closed the independent political life of Provence, which thus passed to the house of Anjou; its fortunes were consequently long bound up with those of the kingdom of Sicily.

Up to this time Louis IX., being mostly under the command of his mother, had shown little sign of greater qualities; now came the crisis which called them forth. He had acted with singular prudence in the contests which surrounded his earlier years, had held aloof from the investiture wars, had stood clear of eastern complications, had kept his barons quiet. Now, however, he was no longer to confine himself to affairs at home; the East, with its dazzling attractions of religion and romance, called for his care; by going thither he would escape from the conflict nearer home, the internecine struggle between the emperor Frederick II. and the papacy, under Innocent IV., and would fulfil the devout longings of his pious spirit by succoring the afflicted Christians against the Moslem and the Tartar. Louis took the cross in 1244, with his three brothers, Robert of Artois, Alphonse of Poitiers, and Charles of Anjou; at Christmas, 1245, "the day of new clothes" when his courtiers donned their new-made cloaks, they found the significant cross on every shoulder; still nothing was done a while, for in truth France was rightly very reluctant to embark in eastern politics. It was not till 1248 that Louis set sail from Aigues-Mortes for Cyprus, the rendezvous for this crusade. The sultan of Cairo was now lord of Palestine; the Tartars had destroyed the power of the sultan of Konieh; Jerusalem was a defenceless heap of ruins. It therefore seemed best to attack the Moslem power at its centre; and this crusade, instead of making for Constantinople, Asia Minor, and Jerusalem, began on the other side by an attack on the headquarters of the Mahometan power in Egypt. In June, 1249, the good king landed on the Egyptian shore and took Damietta without a blow. There the crusaders lingered till the place became a Capua to them; for idleness brought on debauch, and debauch disease; and fever, the avenger of war, soon attacked the army. After nearly six months of ruinous delay the king marched southward, fought the heroic though inconclusive battle of Massourah, which finally arrested his farther progress towards Cairo; and after another long delay the Christians were obliged to retire towards Damietta. On the retreat the whole army was taken by the Saracens, who massacred the common folk and held the nobles to ransom. Louis had to surrender Damietta, and to pay a heavy sum before he could sail from Egypt; and even so, he was obliged to leave behind a vast number of Christian captives. Of the remnant of his great host only about one hundred knights followed him to Palestine,—a fever-

1253-1270. stricken company depressed with ill-fortune and defeat; the rest made for home. Louis landed at Ptolemais, one of the very few cities left in Christian hands, and found little to restore his confidence or the spirits of his followers. He remained four years in the Holy Land, chiefly engaged in arranging the ransom of his captive soldiers; he freed all the prisoners left in Egypt, strengthened the few places held by the Christians, and was almost unmolested by the Saracens, who were nearly as weak in Palestine as he was. At last, on the death of his noble mother Blanche in 1253, finding that his army had almost entirely melted away, that he could not hope to achieve anything in Palestine, and that he was much wanted at home, he set sail at last, and reached France in September, 1254, a sorrowful and beaten man. The one bright spot in his crusade was the development of the king's character; men recognized in him the hero and saint, and what was least wise in his career has covered him with greatest glory.

Still, the best part of his reign was to come; nowhere had better government ever been seen in Europe than that which Louis carried on for the sixteen peaceful years which followed his first crusade. Some of his acts have been sharply criticised; all, however, were in the direction and interests of peace. In 1258 he made treaty with King James of Aragon, settling all points of lordship at issue on that frontier; in 1259 he came to terms with Henry III. of England, yielding to him the Limousin, Perigord, and parts of Saintonge, in return for Henry's abandonment of all claims on the rest of France. Louis hoped thereby to secure perpetual peace and amity between the two countries. At home all his action tended to good. His noble character, his recognized justice, fairness, and holiness, enabled him to intervene as a peacemaker between his lords; there was in him a generous vein of sympathy and love for his people, which prompted him to succor those in distress, to govern well because mercifully, to rule in church and state as one who loved justice and judgment, and to whom the welfare of his subjects was a chief object and the aim of life.

Throughout it all, however, he still cherished in heart the enthusiasm of the crusading spirit. He had failed once; he would try again for the faith against the miscreant. And so in 1267 he again took the cross, and in 1270, in spite of the remonstrances of his wisest friends, set sail once more,—this time not for Constantinople or Palestine, or even Egypt, but for Tunis. The probable motive of this attack on Tunis was the ambition of the king's brother, Charles of Anjou; for a strong Saracen power on that shore was always a menace to his newly acquired Sicilian and Neapolitan kingdom. Be that as it may, the expedition, as a crusade, attacking the very outskirt instead of the heart of the Moslem strength, was foredoomed to fail. The failure came from the beginning; hardly were the crusaders landed when fever and dysentery set in. The king caught it and died. With him ended the crusading era (St. Bartholomew's day, 1270).

Louis the Saint had been a great king, as well as a pious and a virtuous one; in this he stands almost alone in French history. Nor was he backward in matters of learning; his age is an epoch in the growth of French literature. The university of Paris under his care rose to high repute; the greatest learned men in Europe are connected with this period of its history; Albertus Magnus, Roger Bacon, Saint Thomas Aquinas, all studied at Paris. In his reign Robert of Sorbon (1252) founded his college for ecclesiastics, and the famous Sorbonne began its long career. Literature flourished in prose and poetry; the arts took a fresh beginning; Saint Louis raised that chief ornament of architecture in Paris, the Sainte Chapelle.

Above all, the king was notable for his justice, and the use he made of the law. The law, the natural ally of the throne in France, came to his help: by its aid he attacked or undermined feudal privileges; he established a higher jurisdiction than that of the feudal courts, appointed itinerant justices, insisted on a real right of appeal in last resort to himself, curtailed the powers of baronial courts, and the freedom of baronial warfare, and finally rendered the king's "parliament" a great law-court. His legists issued a new code, the "Establishments of Saint Louis," in which feudal custom was largely modified by the Roman law. The king also increased and consolidated the royal domain, acquiring

1270-1297. property whenever it was possible, and administering throughout a uniform rule of law. The kingdom also was greatly enlarged by his care; a large portion of the lands of the count of Toulouse, Chartres also, Blois, Sancerre, Macon, Perche, Arles, and Foix, all became his; Normandy was formally made over to him by Henry III. His brother Charles of Anjou not only secured Provence for himself, and eventually for France, but by finally conquering the last of the Hohenstauffen secured, a doubtful good, French influence in southern Italy. Frederick II. had died in 1250; Manfred, his base-born son, became king of Naples; and Charles, invoked against the hated Hohenstauffen by Pope Urban IV., defeated Manfred in 1266, and his nephew Conradin, the last of the house, in 1268, thereby becoming king of the Two Sicilies. Then began that system of traditional savageness and cruelty which characterizes all the mediæval relations of France with Italy. The "Pragmatic Sanction of Saint Louis" is placed in the year 1269, and (if genuine, which is doubtful) laid down the maxims on which the liberties of the Gallican Church are founded. The king and his lawyers were certainly quite as unwilling to allow the church as the baronage to win independence, and to plunge the kingdom into confusion.

Philip III. Philip III., the Rash, succeeded on his father's death,—an unlearned, weak man, whose history is uneventful, save that it is the period in which the foreign influence of France received a great check through the Sicilian Vespers (1282), which deprived Charles of Anjou of his throne, in spite of the urgent efforts of the papacy. Philip was also unlucky in his dealings with Aragon; on his return from an expedition into Spain, in which he ruined a great fleet and army, he fell ill and died, in 1285.

Philip IV., the Fair. In 1274 the count of Champagne, Henry of Navarre, had died, leaving one child, a girl, three years old. She was affianced in 1276 to Philip, son of Philip III., and Navarre was thus brought into the French kingdom. And so it fell out that when Philip IV., the "Fair," that proud young prince, succeeded, he was already master of the fortunes of a larger France than had ever yet been known. Lawyers surrounded his throne from the beginning; he was the fitting leader in a great revival of the Roman law, that terrible enemy to feudalism and the mediæval papacy.

In the beginning of his reign Philip IV. worked by means of his lawyers; they put a stop, in large part, to clerical administration; the parliament fell completely into their hands, and ere long (1302) was permanently fixed at Paris, and became the chief legal authority in the realm. The king's fiscal necessities threatened to overwhelm him; the older system of sustenance, based on the royal domain, had completely given way. To this reign France owes the first beginnings of a formidable system of taxation; to Philip IV. is due the ill-sounding maltôte, the "ill-levied" tax. He seized what he could, wrung the Jews, confiscated the wealth of the Templars, turned everything into hard cash, sold privileges to towns, tampered with the coin; by sumptuary laws he succeeded in taxing even his nobles. This state of need and greed brought on the great strife of his reign, the quarrel with Boniface VIII. It was a many-sided struggle,—that of the temporal against the spiritual authority; that of the civil against the canon law; that of the lawyers against the clergy; that of France against Italy. Soon after his accession in 1294 Boniface VIII. had tried to mediate between the two great lawyer-princes, Edward I. of England and Philip the Fair. The kings took it much amiss; and when in 1296 Boniface issued the famous bull Clericis laicos, which forbade the clergy to pay taxes to the civil power unless the papal power sanctioned them, Philip answered by an ordinance which prohibited the export of valuables of all kinds from the kingdom. The pope's reply created open breach, and Philip let loose his lawyers on the Italian priests. The strife, however, was speedily allayed, and a seeming reconciliation took place over the canonization of Louis IX., which occurred on the anniversary of his death, St. Bartholomew's day, 1297. Boniface also mediated successfully between the French and English kings, securing a large part of Aquitaine to France. It was, however, but a truce, which enabled Philip, not only to win this portion of Aquitaine, but to attach to himself the friendship of the duke of Brittany, and to occupy Flanders. So things went on till the year of jubilee, 1300, when Boniface seemed to have been lifted up above all the princes of the earth. About this time the pope nominated as his legate in France Saisset bishop of Pamiers, an open foe to the French crown. He made use of his new authority to stir up strife in the south, and Philip IV. arrested him at Pamiers as a traitor. Forthwith the old strife broke out again,—a terrible war of words ensuing, lawyer's pamphlets met by papal bulls, which affirmed (as in the great Ausculta fili bull) the supremacy of the pope over all kings. The king threw himself on the patriotism of his people, and called together the three Estates of France, nobles, clergy, and burghers, to sit at Paris and consider his grievances. The nobles and burghers spoke out bravely for their king against the papal claims; the clergy applied for leave to attend the council convoked at Rome. Their request was refused; if they went their goods would be forfeited. 1300-1314.

Just before this had broken out a revolt at Bruges (1302), in which the enraged Flemish had risen on and destroyed their new masters; the French nobles, eager for vengeance and spoil, hastily assembled and marched northwards, under the guidance of Robert of Artois; hard by Courtrai the Flemish burghers, led by Guy of Namur, inflicted on them the worst defeat ever yet sustained by French chivalry; the "Day of the Spurs" was a fitting name for a carnage after which four thousand gilt spurs were hung as trophies in Courtrai cathedral.

The foremost men of France had perished in a ditch; and though for the moment Boniface rejoiced, and deemed his rival to be ruined, in the event this overthrow of feudalism turned completely to the king's advantage. The bishops, thinking also that the royal power was broken, set forth for Rome. For the moment even Philip seemed to lose confidence, and the papacy enunciated its highest claims. The king, however, soon recovered force; he made peace with Edward of England, ceding Guienne to him, and marrying his daugher Isabella to the younger Edward. It was now that he debased the coin and imposed the odious maltôte. William of Nogaret was sent to Italy to lodge with the pope the king's appeal from his authority to a general council and a legitimate pope. In reply the pope announced that he was about to lay an interdict on the kingdom. Then Nogaret called in the help of the Colonnas, the family foes of Boniface, who gladly seized the pope at Anagni; the mortifications and privations of the moment were too much for the aged pontiff, and though the Romans delivered him from captivity, he gave way and died. Thus was Philip IV. delivered from his worst antagonist. In 1304 he made peace with the Flemish, giving up his claim to Flanders, and drawing himself together to complete his victory over the papacy. In 1305 he succeeded in forcing on the conclave of cardinals his nominee Bertrand de Goth, archbishop of Bordeaux, who became pope as Clement V., and was consecrated at Lyons; then the great "captivity" began. Clement, as the price of his elevation, cancelled the bulls of Boniface, and pardoned the king's lawyers; he created nine French cardinals, so as to secure the king's influence in the conclave. Philip pressed him to condemn the memory of Boniface, and to consent to the ruin of the Templars; this, however, the poor pope avoided, with pretexts sufficient for the time. When Philip pressed him still more closely, for the Templars were rich and unpopular, and busy rumor had darkened their character with fancied details of unholy crimes, Clement endeavored to escape by flight. The king arrested him, and brought him back to Poitiers. In 1309 this miserable pontiff was allowed to travel southward, though Philip absolutely refused to let him return to Rome, and was fain to fix his seat at Avignon on the Rhone, a city then in the possession of Charles V. of Anjou, and hard by the papal county of the Venaissin. Here the papacy abode in discredit and subjection to the French crown for seventy years.

The condemnation of Boniface was deferred a while; it was but a barren revenge, and the Templars were a richer spoil. In spite of their heroic defence and resistance, they were condemned in 1310, and perished as martyrs to their cause. In 1312 the abolition of the Order was decreed by Clement V., and their wealth, in large part, fell into the king's hands. These gloomy years fitly close the reign of Philip IV.; he died in 1314 from the effects of a hunting accident. He had not added much to the dimensions of the kingdom; the addition of Lyons (1312) was his greatest achievement in this way; he had immensely increased the royal authority at home, and had triumphed over the papacy, the conqueror of the empire.

The sons of Philip the Fair.

Philip IV., died, leaving three sons, who all succeeded him. In the house of Capet, there had hitherto been alternately weak and strong monarchs; now, however, the vigor of the race was gone. The reign of Louis X., "le Hutin," the quarreller, was brief and unimportant; it was naturally enough a time of reaction, in which things seemed to fall back into feudal anarchy and weakness. There was great distress and famine in France in 1315–1316, and a campaign against the Flemings was a complete failure. In June, 1316, Louis died, leaving his queen with child. She bore a son, named John, who lived seven days, being during that time nominal king of France; on his death, the late king's next brother Philip V., "the Tall," succeeded to the throne, basing his claims on the so-styled Salic law of France, according to which "no woman could succeed to Salian soil," and, *a fortiori*, no woman could succeed to the Salian, that is, to the French throne. He reigned six miserable years, without credit, though he published not a few ordinances. He died in 1322, and was succeeded by his youngest brother Charles IV., "the Fair," whose six years' reign ended in 1328. With him the direct line of the House of Capet came to an end,—cursed with barrenness and incapacity, men held, by the curse of the dying Templars.

The house of Valois.

Charles, count of Valois, was the younger brother of Philip the Fair, and therefore uncle of the three sovereigns lately dead. His eldest son Philip had been appointed guardian to the queen of Charles IV.; and when it appeared that she had given birth to a daughter and not a son, the barons, joining with the notables of Paris and the good towns, met to decide who was by right the heir to the throne, "for the twelve peers of France said and say that the crown of France is of such noble estate that by no succession can it come to a woman nor to a woman's son," as Froissart tells us. This being their view, the baby daughter of Charles IV. was at once set aside, and the claim of Edward III. of England, if, indeed, he ever made it, rested on Isabella of France, his mother, sister of the three sovereigns. And if succession through a female had been possible, then the daughters of those three kings had rights to be reserved. It was, however, clear that the throne must go to a man, and the crown was given to Philip of Valois, founder of a new house of sovereigns.

Philip VI.

The new monarch was a very formidable person. He had been a great feudal lord, hot and vehement, after feudal fashion; he was now to show that he could be a severe master, a terrible king. He began his reign by subduing the revolted Flemings on behalf of his cousin Louis of Flanders, and having replaced him in his dignities, returned to Paris, and there held high state as king. And he clearly was a great sovereign: the weakness of the late king had not seriously injured France; the new king was the elect of the great lords, and they believed that his would be a new feudal monarchy; they were in the glow of their revenge over the Flemings for the day of Courtrai; his cousins reigned in Hungary and Naples, his sisters were married to the greatest of the lords; the queen of Navarre was his cousin; even the youthful king of England did him homage for Guienne and Ponthieu. The barons soon found out their mistake. Philip VI., supported by the lawyers, struck them whenever they gave him opening; he also dealt harshly with the traders, hampering and all but ruining them, till the country was alarmed and discontented. On the other hand, young Edward of England had succeeded to a troubled inheritance, and at the beginning was far weaker than his rival: his own sagacity, and the advance of constitutional rights in England, soon enabled him to repair the breaches in his kingdom, and to gather fresh strength from the prosperity and good-will of a united people. While France followed a more restrictive policy, England threw open her ports to all comers; trade grew in London as it waned in Paris; by his marriage with Philippa of Hainault, Edward secured a noble queen, and with her the happiness of his subjects and the all-important friendship of the Low Countries. In 1336 the folly of Philip VI. persuaded Louis of Flanders to arrest the English merchants then in Flanders; whereon Edward retaliated by stopping the export of wool; and Jacquemart van Arteveldt of Ghent, then at the beginning of his power, persuaded the Flemish cities to throw off all allegiance to their French-loving count, and to place themselves under the protection of Edward. In return Philip VI. put himself in communication with the Scots, the hereditary foes of England; and the great wars which were destined to last 116 years, and to exhaust the strength of two strong nations, were now about to begin. They brought brilliant and barren triumphs to England, and, like most wars, were a wasteful and terrible mistake, which, if crowned with ultimate success, might, by removing the centre of the kingdom into France, have marred the future welfare of England; for the happy constitutional development of the country could never have taken place with a sovereign living at Paris, and French interests becoming ever more powerful. Fortunately, therefore, while the war evoked by its brilliant successes the national pride of Englishmen, by its eventual failure it was prevented from inflicting permanent damage on England.

Beginnings of war between England and France.

The war began in 1337, and ended in 1453; the epochs in it are the treaty of Bretigny in 1360, the treaty of Troyes in 1422, the final expulsion of the English in 1453.

The "Hundred Years' War."

The French king seems to have believed himself equal to the burdens of a great war, and able to carry out the most far-reaching plans. The pope was entirely in his hands, and useful as a humble instrument to curb and harass the emperor. Philip had proved himself master of the Flemish, and, with help of the king of Scotland, hoped so to embarrass Edward III. as to have no difficulty in eventually driving him to cede all his French possessions. While he thought it his interest to wear out his antagonist without any open fighting, it was Edward's interest to make vigorous and striking war. France therefore stood on the defensive; England was always the attacking party. On two sides, in Flanders and in Brittany, France had outposts which, if well defended, might long keep the English power far away from her vitals. Unluckily for his side, Philip was harsh and rash, and threw these advantages away. In Flanders the repressive commercial policy of the count, dictated from Paris, gave Edward the opportunity, in the end of 1337, of sending the earl of Derby with a strong fleet to raise the blockade of Cadsand, and to open the Flemish markets by a brilliant action, in which the French chivalry was found powerless against the English yeomen-archers; and in 1338 Edward crossed over to Antwerp to see what forward movement could be made. The other frontier war was that of Brittany, which began a little later (1341). The openings of the war were gloomy and wasteful, without glory. Edward did not actually send defiance to Philip till 1339, when he proclaimed himself king of France, and quartered the lilies of France on the royal shield. The Flemish proved a very reed; and though the French army came up to meet the English in the Vermandois country, no fighting took place, and the campaign of 1339 ended obscurely. Norman and Genoese ships threatened the southern shores of England, landing at Southampton and in the Isle of Wight unopposed. In 1340 Edward returned to Flanders; on his way he attacked the French fleet which lay at Sluys, and utterly destroyed it. The great victory of Sluys gave England for centuries the mastery of the British channel. But, important as it was, it gave no success to the land-campaign. Edward wasted his strength on an unsuccessful siege of Tournai, and, ill-supported by his Flemish allies, could achieve nothing. The French king in this year seized on Guienne; and from Scotland tidings came that Edinburgh castle, the strongest place held by the English, had fallen into the hands of Douglas. Neither from Flanders nor from Guienne could Edward hope to reach the heart of the French power; a third inlet now presented itself in Brittany. On the death of John III. of Brittany in 1341, John of Montfort, his youngest brother, claimed the great fief against his niece Jeanne, daughter of his elder brother Guy, count of Penthievre. He urged that the Salic law which had been recognized in the case of the crown, should also apply to this great duchy, so nearly an independent sovereignty. Jeanne had been married to Charles of Blois, whom John III. of Brittany had chosen as his heir; Charles was also nephew of King Philip, who gladly espoused his cause. Thereon John of Montfort appealed to Edward, and the two kings again met in border strife in Brittany. The Bretons

1345-1356.

sided with John against the influence of France. Both the claimants were made prisoners; the ladies carried on a chivalric warfare, Jeanne of Montfort against Jeanne of Blois, and all went favorably for the French party till Philip, with a barbarity as foolish as it was scandalous, tempted the chief Breton lords to Paris and beheaded them without trial. The war, suspended by a truce, broke out again, and the English raised large forces and supplies, meaning to attack on three sides at once,—from Flanders, Brittany, and Guienne. The Flemish expedition came to nothing; for the people of Ghent in 1345 murdered Jacques van Artevveldt as he was endeavoring to persuade them to receive the Prince of Wales as their count; and Edward, on learning this adverse news, returned to England. Thence in July, 1346, he sailed for Normandy, and landing at La Hogue overran with ease the country up to Paris. He was not, however, strong enough to attack the capital, for Philip lay with a large army watching him at St. Denis. After a short hesitation Edward crossed the Seine at Poissy, and struck northwards, closely followed by Philip. He got across the Somme safely, and at Crécy in Ponthieu stood at bay to await the French. Though his numbers were far less than theirs, he had a good position, and his men were of good stuff; and when it came to the battle, the defeat of the French was crushing. Philip had to fall back with his shattered army; Edward withdrew unmolested to Calais, which he took after a long siege in 1347. Philip had been obliged to call up his son John from the south, where he was observing the English under the earl of Derby; thereupon the English overran all the south, taking Poitiers, and finding no opposition. Queen Philippa of Hainault had also defeated and taken David of Scotland at Neville's Cross.

The campaign of 1346–1347 was on all hands disastrous to King Philip. He sued for and obtained a truce for ten months. These were the days of the "black death," which raged in France from 1347 to 1349, and completed the gloom of the country, vexed by an arbitrary and grasping monarch, by unsuccessful war, and now by the black cloud of pestilence. In 1350 King Philip died, leaving his crown to John of Normandy. He had added two districts and a title to France: he bought Montpellier from James of Aragon, and in 1349 also bought the territories of Humbert, dauphin of Vienne, who resigned the world, under influence of the revived religion of the time, a consequence of the plague, and became a Carmelite friar. The fief and the title of dauphin were granted to Charles, the king's grandson, who was the first person who attached that title to the heir to the French throne. Apart from these small advantages the kingdom of France had suffered terribly from the reign of the false and heartless Philip VI. Nor was France destined to enjoy better things under John "the Good," one of the worst sovereigns with whom she has been cursed. He took as his model and example the chivalric John of Bohemia, who had been one of the most extravagant and worthless of the princes of his time, and had perished in his old age at Crécy. The first act of the new king was to take from his kinsman, Charles "the Bad" of Navarre, Champagne and other lands; and Charles went over to the English king. King John was keen to fight; the States-General gave him the means for carrying on war, by establishing the odious "gabelle" on salt and other imposts. John hoped with his new army to drive the English completely out of the country. Petty war began again on all the frontiers,—an abortive attack on Calais, a guerilla warfare in Brittany, slight fighting also in Guienne. Edward in 1355 landed at Calais, but was recalled to pacify Scotland; Charles of Navarre and the duke of Lancaster were on the Breton border; the Black Prince sailed for Bordeaux. In 1356 he rode northward with a small army to the Loire, and King John, hastily summoning all his nobles and fief holders, set out to meet him. Hereon the Black Prince, whose forces were weak, began to retreat; but the French king outmarched and intercepted him near Poitiers. He had the English completely in his power, and with a little patience could have starved them into submission; instead, he deemed it his chivalric duty to avenge Crécy in arms, and the great battle of Poitiers was the result (19th September, 1356). The carnage and utter ruin of the French feudal army were quite incredible; the dead seemed more than the whole army of the Black Prince; the prisoners were too many to be held. The French army, bereft of leaders, melted away, and the Black Prince rode triumphantly back to Bordeaux with the captive King John and his brave little son in his train. A two years' truce ensued; King John was carried over to London, where he found a fellow in misfortune in David of Scotland, who had been for 11 years a captive in English hands. The utter degradation of the nobles, and the misery of the country, gave to the cities of France an opportunity which one great man, Étienne Marcel, provost of the traders at Paris, was not slow to grasp. He fortified the capital and armed the citizens; the civic clergy made common cause with him; and when the dauphin Charles convoked the three Estates at Paris, it was soon seen that the nobles had become completely discredited and powerless. It was a moment in which a new life might have begun for France; in vain did the noble order clamor for war and taxes,—they to do the war, with what skill and success all men now knew, and the others to pay the taxes. Clergy, however, and burghers resisted. The Estates parted, leaving what power there was still in France in the hands of Étienne Marcel. He strove in vain to reconcile Charles the dauphin with Charles of Navarre, who stood forward as a champion of the towns. Very reluctantly did Marcel entrust his fortunes to such hands. With help of Lecocq, bishop of Laon, he called the Estates again together, and endeavored to lay down sound principles of government, which Charles the dauphin was compelled to accept. Paris, however, stood alone, and even there all were not agreed. Marcel and Bishop Lecocq, seeing the critical state of things, obtained the release of Charles of Navarre, then a prisoner. The result was that ere long the dauphin-regent was at open war with Navarre and with Paris. The outbreak of the miserable peasantry, the Jacquerie, who fought partly for revenge against the nobles, partly to help Paris, darkened the time; they were repressed with savage bloodshed, and in 1358 the dauphin's party in Paris assassinated the only great man France had seen for long. With Étienne Marcel's death all hope of a constitutional life died out from France; the dauphin entered Paris, and set his foot on the conquered liberties of his country. Paris had stood almost alone; civic strength is wanting in France; the towns but feebly supported Marcel; they compelled the movement to lose its popular and general character, and to become a first attempt to govern France from Paris alone. After some insincere negotiations, and a fear of desultory warfare, in which Edward III. traversed France without meeting with a single foe to fight, peace was at last agreed to at Bretigny in May, 1360. By this act Edward III. renounced the French throne, and gave up all he claimed or held north of the Loire, while he was secured in the lordship of the south and west, as well as of that part of northern Picardy which included Calais, Guines, and Ponthieu. The treaty also fixed the ransom to be paid by King John.

John "the Good."

1356-1364.

Étienne Marcel.

The peace of Bretigny.

France was left smaller than she had been under Philip Augustus, yet she received this treaty with infinite thankfulness; worn out with war and weakness, any diminutio of territory seemed better to her than a continuance of he unbearable misfortunes. Under Charles, first as regent, the as king, she enjoyed an uneasy rest and peace for 20 years The monarchy was disgraced by failure and captivity; th nobles, weakened and discredited in war and peace, heade by factious and self-seeking lords, could offer no hope fo France; the cities had shown, during the effort of Marcel that rare man of energy and genius, that they were unfit t take the command; the Jacquerie had declared the peas antry to be wretched and powerless; the black death wit equal hand had smitten all, and had shown with lurid ligh the scandalous manners of the Avignon papacy, the want of patriotic or religious energy in the clergy; the country wa pitilessly ravaged by the free companies, the inheritance o the war. In all Europe it was a dark and gloomy time; i France men might well despair. King John, after return ing for a brief space to France, went back into his pleasan captivity in England, leaving his country to be ruled by th regent the dauphin. In 1364 he died, and Charles V., "the Wise," became king in name, as he had now been for some years in fact. This cold, prudent, sickl prince, a scholar who laid the foundations of the great l brary of Paris by placing 900 MSS. in three chambers i the Louvre, had nothing to dazzle the ordinary eye; to th timid spirits of that age he seemed to be a malevolent wiz

Charles V.

1364-1378.

ard, and his name of "Wise" had in it more of fear than of love. Yet he was a successful prince for the times; he discerned that nothing could be gained by fighting battles,—that Ennius had given him the clue to victory in describing Fabius as one who "cunctando restituit rem;" and he had the passive coldness of heart needful to carry out such a plan.

Du Guesclin.

He also is notable for two things: he reformed the current coin, and recognized the real worth of Du Guesclin, the first great leader of mercenaries in France, a grim fighting-man, hostile to the show of feudal warfare, and herald of a new age of contests, in which the feudal levies would fall into the background. The invention of gunpowder in this century, the incapacity of the great lords, the rise of free lances and mercenary troops, all told that a new era had arrived. It was by the hand of Du Guesclin that Charles overcame his cousin and namesake Charles of Navarre, and compelled him to peace. On the other hand, in the Breton war which followed just after, he was defeated by Sir John Chandos and the partisans of John of Montfort, who made him prisoner; the treaty of Guerande which followed gave them the dukedom of Brittany; and Charles V., unable to resist, was fain to receive the new duke's homage, and to confirm him in the duchy. The king did not rest till he had ransomed Du Guesclin from the hands of Chandos; he then gave him commission to raise a paid army of freebooters, the scourge of France, and to march with them to support, against the Black Prince, the claims of Henry of Trastamare to the crown of Castile. Successful at first, by help of the king of Aragon, he was made constable of Spain at the coronation of Henry at Burgos; Edward the Black Prince, however, intervened, and at the battle of Najara (1367) Du Guesclin was again a prisoner in English hands, and Henry lost his throne. Fever destroyed the victorious host, and the Black Prince, withdrawing into Gascony, carried with him the seeds of the disorder which shortened his days. Du Guesclin soon got his liberty again; and Charles V., seeing how much his great rival of England was weakened, determined at last on open war. He allied himself with Henry of Trastamare, listened to the grievances of the Aquitanians, summoned the Black Prince to appear and answer the complaints. In 1369 Henry defeated Pedro, took him prisoner, and murdered him in a brawl; thus perished the hopes of the English party in the south. About the same time Charles V. sent open defiance and declaration of war to England. Without delay he surprised the English in the north, recovering all Ponthieu at once; the national pride was aroused; Philip, duke of Burgundy, who had, through the prudent help of Charles, lately won as a bride the heiress of Flanders, was stationed at Rouen, to cover the western approach to Paris, with strict orders not to fight; the Aquitanians were more than half French at heart. The record of the war is as the smoke of a furnace. We see the reek of burnt and plundered towns; there were no brilliant feats of arms; the Black Prince, gloomy and sick, abandoned the struggle, and returned to England to die; the new governor, the earl of Pembroke, did not even succeed in landing: he was attacked and defeated off Rochelle by Henry of Castile, his whole fleet with all its treasure and stores taken or sunk, and he himself was a prisoner in Henry's hands. Du Guesclin had already driven the English out of the west into Brittany; he now overran Poitou, which received him gladly; all the south seemed to be at his feet. The attempt of Edward III. to relieve the little that remained to him in France failed utterly, and by 1372 Poitou was finally lost to England. Charles set himself to reduce Brittany with considerable success; a diversion from Calais caused plentiful misery in the open country; but, as the French again refused to fight, it did nothing to restore the English cause. By 1375 England held nothing in France except Calais, Cherbourg, Bayonne, and Bordeaux. Edward III., utterly worn out with war, agreed to a truce, through intervention of the pope; it was signed in 1375. In 1377, on its expiry, Charles, who in the two years had sedulously improved the state of France, renewed the war. By sea and land the English were utterly overmatched, and by 1378 Charles was master of the situation on all hands. Now, however, he pushed his advantages too far; and the cold skill which had overthrown the English was used in vain against the Bretons, whose duchy he desired to absorb. Languedoc and Flanders also revolted against him. France was heavily burdened with taxes, and the future was dark and threatening. In the midst of these things, death overtook the coldly-calculating monarch in September, 1380.

1380-1390.

Charles VI.

Little had France to hope from the boy who was now called on to fill the throne. Charles VI. was not twelve years old, a light-witted, handsome boy, under the guardianship of the royal dukes his uncles, who had no principles except that of their own interest to guide them in bringing up the king and ruling the people. They selfishly quarrelled round his person; the duke of Anjou stole his money and set off to make good his claims on Naples and Sicily; the duke of Burgundy had great prospects in the Low Countries; the duke of Berri ruled in southern France, and was a man of no character or worth; the duke of Bourbon, the late king's brother-in-law, with Burgundy, had charge of the boy's education; Oliver Clisson was made constable of France in the room of Du Guesclin. Before Charles VI. had reached years of discretion he was involved by the French nobles in war against the Flemish cities, which, under guidance of the great Philip van Arteveldt, had overthrown the authority of the count of Flanders. The French cities showed ominous signs of being inclined to ally themselves with the civic movement in the north. The men of Ghent came out to meet their French foes, and at the battle of Roosebek (1382) were utterly defeated and crushed. Philip van Arteveldt himself was slain. It was a great triumph of the nobles over the cities; and Paris felt it when the king returned. All movement there and in the other northern cities of France was ruthlessly repressed; the noble reaction also overthrew the "new men" and the lawyers, by whose means the late king had chiefly governed. Two years later, the royal dukes signed a truce with England, including Ghent in it; and Louis de Mâle, count of Flanders, having perished at the same time, Margaret, his daughter, wife of Philip of Burgundy, succeeded to his inheritance (1384). Thus began the high fortunes of the house of Burgundy, which at one time seemed to overshadow emperor and king of France. In 1385 another of the brothers, Louis, duke of Anjou, died, with all his Italian ambitions unfulfilled. In 1386 Charles VI., under guidance of his uncles, declared war on England, and exhausted all France in preparations; the attempt proved the sorriest failure. The regency of the dukes became daily more unpopular, until in 1388 Charles dismissed his two uncles, the dukes of Burgundy and Berri, and began to rule. For a while all went much better; he recalled his father's friends and advisers, lightened the burdens of the people, allowed the new ministers free hand in making prudent government; and learning how bad had been the state of the south under the duke of Berri, deprived him of that command in 1390. Men thought that the young king, if not good himself, was well content to allow good men to govern in his name; at any rate the rule of the selfish dukes seemed to be over. Their bad influences, however, still surrounded him; an attempt to assassinate Oliver Clisson the constable was connected with their intrigues and those of the duke of Brittany; and in setting forth to punish the attempt on his favorite the constable, the unlucky young king, who had sapped his health by debauchery, suddenly became mad. The dukes of Burgundy and Berri at once seized the reins, and put aside his brother the young duke of Orleans.

Burgundians and Armagnacs.

It was the beginning of that great civil discord between Burgundy and Orleans, the Burgundians and Armagnacs, which worked so much ill for France in the earlier part of the next century. The rule of the uncles was disastrous for France; no good government seemed even possible for that unhappy land. From time to time the unfortunate king had lucid intervals; he seems even to have tried to put a stop to the great schism of the West, that struggle between rival popes, the scandalous quarrel of "Urbanists," followers of Urban VI.. elected at Rome (in 1378) in opposition to the French power, and of "Clementines," followers of the Avignon pope, Clement VII.

Urbanists and Clementines.

But his lucid intervals were too short and few; and the French court was also too much engaged in the Burgundian and Orleanist contest to care much for the peace of the church. There is no more gloomy period of French history than the coming 50 years. It is the record of party strife of a mean and unscrupulous kind, in which also Paris begins her new rôle of partisan. The struggle in the 15th

1390-1407.

century between royalty and aristocracy is an unlovely sight, whether it be watched in England, in Germany, or in France. In France the contest took a peculiar form; the whole country seemed to be arrayed under two hostile banners—that of the house of Burgundy, and that of the duke of Orleans. The house of Burgundy was headed by men of grasp and power, and its party bore the name of Burgundians, little as it expressed the true position; while the duke of Orleans was a mean and foolish person, and his party did not go by his name, but, by some accident, took that of the count of Armagnac, who was father-in-law to the duke of Orleans, and a prince of great name and vigor in the south of France. The duke of Burgundy was Philip the Bold, fourth son of King John of France, to whom his father had granted the duchy on the death of Philip de Rouvres, who had left no heirs, so that his inheritance had escheated to the crown. The duke was therefore uncle to Charles VI., and to his rival in France, Louis, duke of Orleans. By his marriage with Margaret of Flanders, to whom the county of Burgundy had descended by female succession, he reunited the duchy and county, and also became lord of Flanders. Though the county (Franche Comté) carried him to the east of France into the empire, his chief power lay in the north. His connection with Germany led him to espouse the side of the Urbanists against the corrupt Avignon papacy, the policy of the duke made him popular with the cities of the north of France, and specially with Paris,—a popularity in no way impaired by his terrible punishment of Liége, which opposed him in 1408; that policy professed to relieve the cities of their worst burdens, and to give them a position of some independence in the presence of their unhappy sovereign and the corrupt court around him. In his foreign politics the duke had also added much to his strength by supporting the house of Lancaster in its successful attack on Richard II.; the friendship of Henry IV. and Henry V. of England was the result. In resources the house of Burgundy was deemed the richest in the world, and its magnificence on great occasions rivalled all that had been dreamt in fable. Lastly, while the French monarchs were a weary series of diseased or dissolute princes, their Burgundian cousins were all strong men—men of faults enough, no doubt, but not of weak vices.

On the other hand, the duke of Orleans, with his following of nobles, was of the south; all his strength lay beyond the Loire, and his party represented the old aristocracy against the modern princes and the popular instincts of the cities. There is no greater mistake than that of speaking of the Burgundian dukes as the last great leaders of feudalism; the feudalism of the age was far more definitely on the side of the Armagnacs. In his church politics Orleans supported the southern Avignon pope against the Germanic and Italian Urbanists; in his foreign politics he and the court went with the losing Yorkist party in England, Richard II. having in 1396 espoused Isabelle of Valois, eldest daughter of Charles VI. At the beginning the Armagnacs were a mere court and noble party; no general or patriotic feelings seemed to be in question; as, however, time went on, and the house of Burgundy drew closer and closer to that of Lancaster, and when England and Burgundy in the days of Henry V. and Bedford seemed to be subjecting France for ever to the foreigner, then the Armagnac party gradually asserted a far higher position for itself, took up the national cause, and rousing the hitherto unconscious patriotism of the people, swept away the invader and his friends.

Party strife in France.

An obscure strife went on until 1404, when Duke Philip of Burgundy died, leaving his vast inheritance to John the Fearless, the deadly foe of Louis of Orleans. Paris was with him, as with his father before him; the duke entered the capital in 1405, and issued a popular proclamation against the ill-government of the queen-regent and Orleans. Much profession of a desire for better things was made, with small results. So things went on till 1407, when, after the duke of Berri, who tried to play the part of a mediator, had brought the two princes together, the duke of Orleans was foully assassinated by a Burgundian partisan. The duke of Burgundy, though he at first withdrew from Paris, speedily returned, avowed the act, and was received with plaudits by the mob. For a few years the strife continued, obscure and bad; a great league of French princes and nobles was made to stem the success of the Burgundians; and it was about this time that the Armagnac name became common. Paris, however, dominated by the "Cabochians," the butchers' party, the party of the "marrow-bones and cleavers," and entirely devoted to the Burgundians, enabled John the Fearless to hold his own in France; the king himself seemed favorable to the same party. In 1412 the princes were obliged to come to terms, and the Burgundian triumph seemed complete. In 1413 the wheel went round, and we find the Armagnacs in Paris, rudely sweeping away all the Cabochians with their professions of good civic rule. The duke of Berri was made captain of Paris, and for a while all went against the Burgundians, until in 1414 Duke John was fain to make the first peace of Arras, and to confess himself worsted in the strife. The young dauphin Louis took the nominal lead of the national party, and ruled supreme in Paris in great ease and self-indulgence.

1412-1422.

Henry V. of England.

The year before Henry V. had succeeded to the throne of England,—a bright and vigorous young man, eager to be stirring in the world, brave and fearless, with a stern grasp of things beneath all,—a very sheet anchor of firmness and determined character. Almost at the very opening of his reign, the moment he had secured his throne, he began a negotiation with France which boded no good. He offered to marry Catharine, the king's third daughter, and therewith to renew the old treaty of Bretigny, if her dower were Normandy, Maine, and Anjou, not without a good sum of money. The French court, on the other hand, offered him her hand with Aquitaine and the money, an offer rejected instantly; and Henry made ready for a rough wooing in arms. In 1415 he crossed to Harfleur, and while parties still fought in France, after a long and exhausting siege took the place; thence he rode northward for Calais, feeling his army too much reduced to attempt more. The Armagnacs, who had gathered at Rouen, also pushed fast to the north, and having choice of passage over the Somme, Amiens being in their hands, got before King Henry, while he had to make a long round before he could get across that stream. Consequently, when on his way he reached Azincourt, he found the whole chivalry of France arrayed against him in his path. The great battle of Azincourt followed, with frightful ruin and carnage of the French. With a huge crowd of prisoners the young king passed on to Calais, and thence to England. The Armagnacs' party lay buried in the hasty graves of Azincourt; never had there been such slaughter of nobles. Still, for three years they made head against their foes; till in 1418 the duke of Burgundy's friends opened Paris' gates to his soldiers, and for the time the Armagnacs seemed to be completely defeated; only the dauphin Charles made feeble war from Poitiers. Henry V. with a fresh army had already made another descent on the Normandy coast; the dukes of Anjou, Brittany, and Burgundy made several and independent treaties with him; and it seemed as though France had completely fallen in pieces. Henry took Rouen, and although the common peril somewhat silenced the strife of faction, no steps were taken to meet him or check his course; on the contrary, matters were made even more hopeless by the murder of John, duke of Burgundy, in 1419, even as he was kneeling and offering reconciliation at the young dauphin's feet. The young Duke Philip now drew at once towards Henry, whom his father had apparently wished with sincerity to check; Paris, too, was weary of the Armagnac struggle, and desired to welcome Henry of England; the queen of France also went over to the Anglo-Burgundian side. The end of it was that on May 21, 1420, was signed the famous treaty of Troyes, which secured the crown of France to Henry, by the exclusion of the dauphin Charles, whenever poor mad Charles VI. should cease to live. Meanwhile Henry was made regent of France, promising to maintain all rights and privileges of the parliament and nobles, and to crush the dauphin with his Armagnac friends, in token whereof he was at once wedded to Catharine of France, and set forth to quell the opposition of the provinces. By Christmas all France north of the Loire was in English hands. All the lands to the south of the river remained firmly fixed in their allegiance to the dauphin and the Armagnacs, and these began to feel themselves to be the true French party, as opposed to the foreign rule of the English. For barely two years that rule was carried on by Henry V. with inflexible justice, and northern France saw with amazement the presence of a real king and an orderly government. In 1422 King Henry died; a few weeks later Charles VI. died also; and

The treaty of Troyes.

1423-1429.

Charles VII.

the face of affairs began to change, although at the first Charles VII. the "Well-served," the lazy, listless prince, seemed to have little heart for the perils and efforts of his position. He was proclaimed king at Mehun in Berri, for the true France for the time lay on that side of the Loire; and the regent Bedford, who took the reins at Paris, was a vigorous and powerful prince, who was not likely to give way to an idle dreamer. At the outset Charles suffered two defeats, at Crevant in 1423 and at Verneuil in 1424, and things seemed to be come to their worst. Yet he was prudent, conciliatory, and willing to wait; and as the English power in France,—that triangle of which the base was the sea line from Harfleur to Calais, and the apex Paris,—was unnatural, and far from being really strong, and as the relations between Bedford and Burgundy might not always be friendly, the man who could wait had many chances in his favor. Before long things began to mend; Charles wedded Mary of Anjou, and won over that great house to the French side; more and more was he regarded as the nation's king; symptoms of a wish for reconciliation with Burgundy appeared; the most vehement Armagnacs were sent away from court. Causes of disagreement also shook the friendship between Burgundy and England.

Feeling the evils of inaction most, Bedford in 1428 decided on a forward movement, and sent the earl of Salisbury to the south. He first secured his position on the north of the Loire, then, crossing that river, laid siege to Orleans, the key to the south, and the last bulwark of the national party. All efforts to vex or dislodge him failed; the attempt early in 1429 to stop the English supplies was completely defeated at Bouvray; from the salt fish captured, the battle has taken the name of "the Day of the Herrings." Dunois, bastard of Orleans, was wounded; the Scots, the king's bodyguard, on whom fell ever the grimmest of the fighting, suffered terribly, and their leader was killed. All went well for Bedford till it suited the duke of Burgundy to withdraw from his side, carrying with him a large part of the fighting power of the besiegers. Things were already looking rather gloomy in the English camp, when a new and unexpected rumor struck all hearts cold with fear. A virgin, an Amazon, had been raised up as a deliverer for France, and would soon be on them, armed with mysterious powers.

The Maid of Orleans.

A young peasant girl, one Jeanne Darc, had been brought up in the village of Domrémy, hard by the Lorraine border. The district, always French in feeling, had lately suffered much from Burgundian raids; and this young damsel, brooding over the treatment of her village and her country, and filled with that strange vision-power which is no rare phenomenon in itself with young girls, came at last to believe with warm and active faith in heavenly appearances and messages, all urging her to deliver France and her king. From faith to action the bridge is short; and ere long the young dreamer of seventeen set forth to work her miracle. Her history is quite unique in the world; and though probably France would ere many years have shaken off the English yoke, for its strength was rapidly going, still to her is the credit of having proved its weakness, and of having asserted the triumphant power of a great belief. All gave way before her; Charles VII., persuaded doubtless by his mother-in-law Yolande of Aragon, who warmly espoused her cause, listened readily to the maiden's voice; and as that voice urged only what was noble and pure, she carried conviction as she went. In the end she received the king's commission to undertake the relief of Orleans. Her coming was fresh blood to the defence; a new spirit seemed to be poured out on all her followers, and in like manner a deep dejection settled down on the English. The blockade was forced, and in eight days the besiegers raised the siege and marched away. They withdrew to Jargeau, where they were attacked and routed with great loss. A little later Talbot himself, who had marched to help them, was also defeated and taken. Then, compelling Charles to come out from his inglorious ease, she carried him triumphantly with her to Rheims, where he was duly crowned king, the Maid of Orleans standing by, and holding aloft the royal standard.

She would gladly have gone home to Domrémy now, her mission being accomplished; for she was entirely free from all ambitious or secondary aims. But she was too great a power to be spared. Northern France was still in English hands, and till the English were cast out her work was not complete; so they made her stay, sweet child, to do the work which, had there been any manliness in them, they ought to have found it easy to achieve for themselves. The dread of her went before her,—a pillar of cloud and darkness to the English, but light and hope to her countrymen. Men believed that she was called of God to regenerate the world, to destroy the Saracen at last, to bring in the millennial age. Her statue was set up in the churches, and crowds prayed before her image as before a popular saint.

1429-1439.

The incapacity and ill-faith of those round the king gave the English some time to recover themselves; Bedford and Burgundy drew together again, and steps were taken to secure Paris. When, however, Jeanne, weary of courtly delays, marched, contemptuous of the king, as far as to St. Denis, friends sprang up on every side. In Normandy, on the English line of communications, four strong places were surprised; and Bedford, made timid as to his supplies, fell back to Rouen, leaving only a small garrison in Paris. Jeanne, ill-supported by the royal troops, failed in her attack on the city walls, and was made prisoner by the Burgundians; they handed her over to the English, and she was, after grievous indignities, and such treatment as chivalry alone could have dealt her, condemned as a witch, and burnt as a relapsed heretic at Rouen in 1431. Betrayed by the French court, sold by the Burgundians, murdered by the English, unrescued by the people of France which she so much loved, Jeanne Darc died the martyr's death, a pious, simple soul, a heroine of the purest metal. She saved her country, for the English power never recovered from the shock. The churchmen who burnt her, the Frenchmen of the unpatriotic party, would have been amazed could they have foreseen that nearly 450 years afterwards, churchmen again would glorify her name as the saint of the church, in opposition to both the religious liberties and the national feelings of her country.

The treaty of Arras.

The Pragmatic Sanction of Bourges.

The war, after having greatly weakened the noblesse, and having caused infinite sufferings to France, now drew toward a close; the duke of Burgundy at last agreed to abandon his English allies, and at a great congress at Arras in 1435 signed a treaty with Charles VII., by which he solemnly came over to the French side. On condition that he should get Auxerre and Macon as well as the towns on and near the river Somme, he was willing to recognize Charles as king of France. His price was high, yet it was worth all that was given; for after all he was of the French blood royal, and not a foreigner. The death of Bedford, which took place about the same time, was almost a more terrible blow to the fortunes of the English. Paris opened her gates to her king in April, 1436; the long war kept on with slight movements now and then for several years. In these same days the council of Basel sat, and declared the supremacy of councils over the papacy; the long evils of schism had brought the pontiff very low. In connection with this council Charles VII. in 1438 held a national council at Bourges, and enacted therein his Pragmatic Sanction, in which the French church repeated the conclusions of the Basel council, and affirmed the liberties of the Gallican Church, in close connection with its allegiance rather to the king than the pope; it also claimed for capitular bodies and monasteries the right of electing their heads, declared the worst of the taxes levied by the papacy on the church illegal, and restrained the right of appeal to Rome. The French Church received the proclamation with gratitude and applause, while the papacy protested, and the dukes of Brittany and Burgundy refused to recognize it or adopt its principles within their dominions. It continued to be the church-law of France till the necessities of Francis I. bartered it away in 1516 for the Bologna concordat.

The next year was marked by the meeting of the States-General, and the establishment, in principle at least, of a standing army. The Estates petitioned the willing king that the system of finance in the realm should be remodelled, and a permanent tax established for the support of an army. Thus, it was thought, solidity would be given to the royal power, and the long-standing curse of the freebooters and brigands cleared away. No sooner was this done than the nobles began to chafe under it; they scented in the air the coming troubles; they took as their head, poor innocents, the young dauphin Louis, who was willing

1439–1453.

The Praguerie.

enough to resist the concentration of power in royal hands. Their champion of 1439, the leader of the "Praguerie," as this new league was called, in imitation, it is said, of the Hussite movement at Prague, the enthusiastic defender of noble privilege against the royal power, was the man who afterwards, as Louis XI., was the destroyer of the noblesse on behalf of royalty. Some of the nobles stood firmly by the king, and, aided by them and by an army of paid soldiers serving under the new conditions, Charles VII., no contemptible antagonist when once aroused, attacked and overthrew the Praguerie: the cities and the country people would have none of it; they preferred peace under a king's strong hand. Louis was sent down to the east to govern Dauphiny; the lessons of the civil war were not lost on Charles; he crushed the freebooters of Champagne, drove the English out of Pontoise in 1441, moved actively up and down France, reducing anarchy, restoring order, resisting English attacks. In the last he was loyally supported by the dauphin, who was glad to find a field for his restless temper. He repulsed the English at Dieppe, and put down the count of Armagnac in the south. During the two years' truce with England which now followed, Charles VII. and Louis drew off their free-lances eastward, and the dauphin came into rude collison with the Swiss not far from Basel, in 1444. Some sixteen hundred mountaineers long and heroically withstood at Saint Jacob the attack of several thousand Frenchmen, fighting stubbornly till they all perished. It is said that the experience so dearly bought on the field of Saint Jacob was very useful to Louis in after days, when he was content to leave Charles the Bold to ruin himself by his attacks on Switzerland. The red wine grown on the slope of the graveyard where they fell is called "Schweitzer-blut," Swiss-blood, to this day. It was at this time also that the cardinal of Winchester wedded Henry VI. of England to Margaret of Anjou, the ambitious daughter of King René, the laughter-loving troubadour of Provence, who cared so much for poetry and so little for kingship. The king and dauphin returned to Paris, having defended their border-lands with credit, and having much reduced the numbers of the lawless free-lances. They next set themselves to organize a regular army of fifteen companies of one hundred lances (each lance representing six fighting men), led by fifteen captains appointed by the king, and raised in different districts of France. This army partly absorbed and partly crushed the troublesome free-lances, and became a powerful police, which restored security and made good government once more possible. Round his own person Charles placed those sturdy and faithful fighting men the Scottish guard; under John Stewart d'Aubigné they served the French king well, and at the end of his troubles were placed as a colony at St. Martin d'Auxigny near Bourges, where their descendants still live in the enjoyment of special village-advantages, preserved to them by long use and tradition through all the changes of French history. This army, with the contingent due from the nobles, which was also reduced to order and made to receive pay, raised the power of the French monarchy far above anything that had as yet been seen; and had Charles VII. been more ambitious he might have begun to play the part reserved for his son. The dauphin, discontented again, was obliged once more to withdraw into Dauphiny, where he governed prudently and with activity.

Close of the Hundred Years' War.

In 1449 the last scene of the Anglo-French war began. In that year English adventurers landed on the Breton coast; the duke called the French king to his aid. Charles did not tarry this time; he broke the truce with England, sent Dunois into Normandy, and himself soon followed. In both duchies, Brittany and Normandy, the French were welcomed with delight; no love for England lingered in the west. Somerset and Talbot failed to defend Rouen, and were driven from point to point, till every stronghold was lost to them. Dunois then passed into Guienne, and in a few months Bayonne, the last stronghold of the English, fell into his hands (1451). When Talbot was sent over to Bordeaux with 5000 men to recover the south, the old English feeling revived,—for England was their best customer, and they had little in common with France. It was, however, but a last flicker of the flame; in July, 1453, at the siege of Castillon, the aged Talbot was slain, and the war at once came to an end; the south passed finally into the kingdom of France. Normandy and Guienne were assimilated to France in taxation and army organization; and all that remained to England across the Channel was Calais with Havre and Guines Castle. Her foreign ambitions and struggles over, England was left to consume herself in civil strife, while France might rest and recover from the terrible sufferings she had undergone. The state of the country had become utterly wretched. We are told that from the Loire to the Somme, as fertile a part as any in France, all lay desert, given up to wolves, and traversed only by the robber and the free-lance; the peasant, despairing of his tillage, got him a weapon, and took to the roads; the *danse Macabre*, grimly limned on churchyard-walls, was a parable of the age, in which all men lived in the presence of death; mysteries and moralities were the chief literature of the time; Froissart was gone, and Commines had not yet come; the duke of Orleans, so long a prisoner in England, is the one true poet of the time; the "good king René" is but in his earlier days, and gave himself most to poetry in his old age; within the walls of a few towns rose some splendid examples of domestic architecture, like the house of Jacques Cœur, the great merchant at Bourges; the stir and movement of the Renaissance finds little sympathy in France in these dark days.

1453–1461.

State of France.

With the end of the English wars new life began to gleam out on France; the people grew more tranquil, finding that toil and thrift bore again their wholesome fruits; Charles VII. did not fail in his duty, and took his part in restoring quiet, order, and justice in the land. With the return of peace came also the arts of peace; the poet's song is heard. Olivier Basselin, whose verses were afterwards retouched and published by Jean de Houx, belongs to this period; now, too, comes Villon, the first of French poets, whose writings ring still with some of the misery of the past; and Alain Chartier follows a little later.

The French crown, though it had beaten back the English, was still closely girt in with rival neighbors, the great dukes on every frontier. All round the east and north lay the lands of Philip of Burgundy; to the west was the duke of Brittany, cherishing a jealous independence; the royal dukes, Berri, Bourbon, Anjou, are all so many potential sources of danger and difficulty to the crown. The conditions of the nobility are altogether changed; the old barons have sunk into insignificance; the struggle of the future will lie between the king's cousins and himself, rather than with the older lords. A few non-royal princes, such as Armagnac, or St. Pol, or Brittany, remain, and will go down with the others; the "new men" of the day, the bastard Dunois or the constables Du Guesclin and Clisson, grow to greater prominence; it is clear that the old feudalism is giving place to a newer order, in which the aristocracy, from the king's brothers downwards, will group themselves around the throne, and begin the process which reaches its unhappy perfection under Louis XIV.

Directly after the expulsion of the English, troubles began between King Charles VII. and the dauphin Louis; the latter could not brook a quiet life in Dauphiny, and the king refused him that larger sphere in the government of Normandy which he coveted. Against his father's will, Louis married Charlotte of Savoy, daughter of his strongest neighbor in Dauphiny; suspicion and bad feeling grew strong between father and son; Louis was specially afraid of his father's counsellors; the king was specially afraid of his son's craftiness and ambition. It came to an open rupture, and Louis in 1456 fled to the court of Duke Philip of Burgundy. There he lived at refuge at Geneppe, meddling a good deal in Burgundian politics, and already opposing himself to his great rival Charles of Charolais, afterwards Charles the Bold, the last duke of Burgundy. Bickerings, under his bad influence, took place between king and duke; they never burst out into flame. So things went on uncomfortably enough, till Charles VII. died in 1461, and the reign of Louis XI. began.

Contrast of Charles VII. and Louis XI.

Between father and son what contrast could be greater? Charles VII., the "Well-served," so easy-going, so open and free from guile; Louis XI., so shy of counsellors, so energetic and untiring, so close and guileful. History does but apologize for Charles, and even when she fears and dislikes Louis, she cannot forbear to wonder and admire. And yet Louis enslaved his country, while Charles had seen it rescued from foreign rule; Charles restored something of its prosperity, while Louis spent his life in crush-

1461-1465. ing its institutions and in destroying its elements of independence. A great and terrible prince, Louis XI. failed in having little or no constructive power; he was strong to throw down the older society, he built little in its room. It is the fatal evil of absolute monarchy that it is not bound to replace what it crushes; so that the old order passes away, and no new society springs up in its place. It is to this that France owes the barrenness of her constitutional history.

Reign of Louis XI. The reign of Louis XI. is well divided into three periods. The first six years of it represent his strife with his great lords (1461–1467); the next period, of nine years, is occupied by his rivalry with Charles the Bold (1469–1476); the third, a time of seven years, gives us the king "triumphant and miserable" (1476–1483).

We are so wont to associate the name of Louis XI. with all that is cold, measured, and crafty that we can scarcely believe we are reading his history when we hear the narrative of his first acts on coming to the throne. He appears as a young impulsive prince, whose frank imprudence calculated no cost. He offended the duke of Burgundy's followers who escorted him to his consecration at Rheims, and thence into Paris, by sending them away empty; he deprived the duke of Bourbon of the government of Guienne, which he held; he dismissed all his father's ministers and friends; he set free the noble captives whom his father had been obliged to restrain; he alienated the nobles and clergy by negotiating with the pope and threatening to abolish the Pragmatic Sanction. In all this he seemed inclined to depend on the support of the good towns. Most serious of all was his action with respect to the district of the river Somme, at that time the northern frontier of France. The towns there had been handed over to Philip of Burgundy by the treaty of Arras, with a stipulation that the crown might ransom them at any time, and this Louis succeeded in doing in 1463. The act was quite blameless and patriotic in itself, yet it was exceedingly unwise, for it thoroughly alienated Charles the Bold, and led to the wars of the earlier period of the reign. Lastly, as if he had not done enough to offend the nobles, Louis in 1464 attacked their hunting rights, touching them in their tenderest part. No wonder that this year saw the formation of a great league against him, and the outbreak of a dangerous civil war. The "League of the Public Weal" was nominally headed by his own brother Charles, heir to the throne; it was joined by Charles of Charolais, who had completely taken the command of affairs in the Burgundian territories, his father the old duke being too feeble to withstand him; the dukes of Brittany, Nemours, Bourbon, John of Anjou, duke of Calabria, the count of Armagnac, the aged Dunois, and a host of other princes and nobles flocked in; and the king had scarcely any forces at his back with which to withstand them. His plans for the campaign against the league were admirable, though they were frustrated by the bad faith of his captains, who mostly sympathized with this outbreak of the feudal nobility. Louis himself marched southward to quell the duke of Bourbon and his friends, and returning from that task, only half done for lack of time, he found that Charles of Charolais had passed by Paris, which was faithful to the king, and was coming down southwards intending to join the dukes of Berri and Brittany, who were on their way towards the capital. The hostile armies met at Montleheri on the Orleans road; and after a strange battle minutely described by Commines—a battle in which both sides ran away, and neither ventured at first to claim a victory—the king withdrew to Corbeil, and then marched into Paris (1465). There the armies of the league closed in on him; and after a siege of several weeks, Louis, feeling disaffection all around him, and doubtful how long Paris herself would bear for him the burdens of blockade, signed the peace of Conflans, which, to all appearances, secured the complete victory to the noblesse, "each man carrying off his piece." Instantly the contented princes broke up their half-starved armies and went home, leaving Louis behind to plot and contrive against them, a far wiser man, thanks to the lesson they had taught him. They did not let him wait long for a chance. The treaty of Conflans had given the duchy of Normandy to the king's brother Charles; he speedily quarrelled with his neighbor the duke of Brittany, and Louis came down at once into Normandy, which threw itself into his arms, and the whole work of the league was broken up. The count of Charolais, occupied with revolts at Dinan and Liége, could not interfere, and presently his father the old Duke Philip died (1467), leaving to him the vast lordships of the house of Burgundy.

1467-1472.

Charles the Bold. And now the "imperial dreamer," Charles the Bold, was brought into immediate rivalry with that royal trickster, the "universal spider," Louis XI. Charles was by far the nobler spirit of the two; his vigor and intelligence, his industry and wish to raise all around him to a higher cultivation, his wise reforms at home, and attempts to render his father's dissolute and careless rule into a well-ordered lordship—all these things marked him out as the leading spirit of the time. He was completely free from those mean faults which marked his antagonist: he could not lie nor cheat; he was not cold and heartless; he despised the immoral life, the loose tales, the disorderly company of the dauphin's sojourn at Geneppe. Unfortunately, in this noble and otherwise harmonious instrument there was that "one little rift," which gradually ruined all: his pride, which was high, would not have been fatal to him; it was his anger, combined with a certain strength of obstinacy, which brought him to ruin. His territories were partly held under France, partly under the empire: the Artois district, which also may be taken to include the Somme towns, the county of Rhetel, the duchy of Bar, the duchy of Burgundy, with Auxerre and Nevers, were feudally in France; the rest of his lands under the empire. He had therefore interests and means of interference on either hand; and, in fact, it is clear that Charles set before himself two quite different lines of policy, according as he looked one way or the other. He looked towards Paris, and seeing the king there growing stronger, desired to curb him by a league of princes; he looked towards the east, and saw there a splendid field for his ambition, in the scattered territories which lay on the edge of the Holy Roman Empire. At first he followed the former line, seeking to weaken his neighbors, and by coalition against the strongest of them to become undoubted master of the rest; this was in the times of his active hostility towards Louis XI.; afterwards he made truce with the king, and turned his arms against the east, attacking first Lorraine, and then Switzerland.

At the time of Duke Philip's death a new league had been formed against Louis, embracing the king of England, Edward IV., the dukes of Burgundy and Brittany, and the kings of Aragon and Castile. Louis strained every nerve, he conciliated Paris, struck hard at disaffected partisans, and in 1468 convoked the States-General at Tours. The three Estates were asked to give an opinion as to the power of the crown to alienate Normandy, the step insisted on by the duke of Burgundy. Their reply was to the effect that the nation forbids the crown to dismember the realm; they supported their opinion by liberal promises of help. Thus fortified by the sympathy of his people, Louis began to break up the coalition. He made terms with the duke of Bourbon and the house of Anjou; his brother Charles was a cipher; the king of England was paralyzed by the antagonism of Warwick; he attacked and reduced Brittany; Burgundy, the most formidable, alone remained to be dealt with. How should he meet him?—by war or by negotiation? His court was divided in opinion; the king decided for himself in favor of the way of negotiation, and came to the astonishing conclusion that he would go and meet the duke and win him over to friendship. He miscalculated both his own powers of persuasion and the force of his antagonist's temper. The interview of Peronne followed; Charles held his visitor as a captive, and in the end compelled him to sign a treaty of peace, on the basis of that of Conflans, which had closed the War of the Public Weal. And as if this were not sufficient humiliation, Charles made the king accompany him on his expedition to punish the men of Liége, who, trusting to the help of Louis, had again revolted (1469). This done, he allowed the degraded monarch to return home to Paris. An assembly of notables at Tours speedily declared the treaty of Peronne null, and the king made some small frontier war on the duke, which was ended by a truce at Amiens in 1471. The truce was spent in preparation for a fresh struggle, which Louis, to whom time was everything, succeeded in deferring from point to point, till the death of his brother Charles, now duke of Guienne, in 1472 broke up the formidable combination. Charles the Bold at once broke truce and made war on the

1472-1483.

king, marching into northern France, sacking towns and ravaging the country, till he reached Beauvais. There the despair of the citizens and the bravery of the women saved the town. Charles raised the siege and marched on Rouen, hoping to meet the duke of Brittany; but that prince had his hands full, for Louis had overrun his territories, and had reduced him to terms. The duke of Burgundy saw that the coalition had completely failed; he too made fresh truce with Louis at Senlis (1472), and only deferred, he no doubt thought, the direct attack on his dangerous rival. Henceforth Charles the Bold turned his attention mainly to the east, and Louis gladly saw him go forth to spend his strength on distant ventures; saw the interview at Trèves with the emperor Frederick III., at which the duke's plans were foiled by the suspicions of the Germans and the king's intrigues; saw the long siege of Neusz wearing out his power; bought off the hostility of Edward IV. of England, who had undertaken to march on Paris; saw Charles embark on his Swiss enterprise; saw the subjugation of Lorraine and capture of Nanci (1475), the battle of Granson, the still more fatal defeat of Morat (1476), and lastly the final struggle of Nanci, and the duke's death on the field (January, 1477).

While Duke Charles had thus been running on his fate, Louis XI. had actively attacked the larger nobles of France, and had either reduced them to submission or had destroyed them. By the time of the fall of the house of Burgundy scarcely one great prince was left who could be formidable; even the power of the duke of Brittany was much straitened. The king had, therefore, free hand to make the best profit he could out of the disasters of his Burgundian rival, and the weakness of his heiress, the young duchess Mary. As Duke Charles had left no male heir, the king at once resumed the duchy of Burgundy, as a male fief of the kingdom; he also took possession of Franche Comté at the same time; the king's armies recovered all Picardy, and even entered Flanders. Then Mary of Burgundy, hoping to raise up a barrier against this dangerous neighbor, offered her hand with all her great territories to young Maximilian of Austria, and married him within six months after her father's death. To this wedding is due the rise to real greatness of the house of Austria; it begins the era of the larger politics of modern times.

After a little hesitation Louis determined to continue the struggle against the Burgundian power. He secured Franche Comté, and on his northern frontier retook Arras, that troublesome border city, the "bonny Carlisle" of those days; and advancing to relieve Therouenne, then besieged by Maximilian, fought and lost the battle of Guinegate (1479). The war was languid after this; a truce followed in 1480, and a time of quiet for France. The misconduct of the French cavalry, which had lost the battle of Guinegate, was followed by the abolition of the free-archer army; the cities were ordered to provide money in place of men, and the age of mercenary foreign armies began. In 1480 also, on the death of the old poet-king René, the two important districts of Anjou and Provence fell in to the crown, Margaret of Anjou, René's daughter and heiress, having ceded them to Louis in return for help; and in the end of 1482 the third peace of Arras closed a while the rivalry between France and Burgundy. Charles the dauphin was engaged to marry the little Margaret, Maximilian's daughter, and as her dower she was to bring Franche Comté and sundry places on the border line disputed between the two princes. In these last days Louis XI. shut himself up in gloomy seclusion in his castle of Plessis near Tours, and there he died in 1483. A great king and a terrible, he has left an indelible mark on the history of France, for he was the founder of France in its later form, as an absolute monarchy ruled with little regard to its own true welfare. He had crushed the older feudalism, and substituted autocracy for anarchy; in all ways he did what he could to centralize the administration; he imposed heavy taxes, and enabled his people to bear them; he employed men of middle condition, and cared for commerce and industry; he treated his towns fairly well, travelled much up and down the realm, acted judiciously in retaining the local estates and parliaments. To his rule is due the rise of that official spirit which marks the practical progress of the life of France; there is no lack of intelligence and vigor in his numerous ordinances, which show that his despotism was not unenlightened or selfish. Though not himself a man of learning, he favored the universities, and set up a printing press in the Sorbonne. We may believe that Louis was perfectly sincere when on his deathbed he longed for a few more years to have set the state in order. He had crushed all resistance; he had enlarged the borders of France, till the kingdom took nearly its modern dimensions; he had organized its army and administration. The danger was lest in the hands of a feeble boy these great results should be squandered away, and the old anarchy once more raise its head.

Character and aims of Louis XI.

1483-1494.

Charles VIII.

For Charles VIII., who now succeeded, was but thirteen years old, a weak boy whom his father had entirely neglected, the training of his son not appearing to be an essential part of his work in life. The young prince had amused himself with romances, but had learnt nothing useful. A head, however, was found for him in the person of his elder sister Anne, whom Louis XI. had married to Peter II., lord of Beaujeu and duke of Bourbon. To her the dying king entrusted the guardianship of his son; and for more than nine years Anne of France was virtual king. For those years all went well. Her prudence and high intelligence overcame her brother's ill-will, and defeated the plots of the nobles, and, almost in spite of Charles, won for him a complete triumph over feudalism. She was, in truth, a very remarkable woman, and history, because she was just and true and successful, has left her on one side, neglected and forgotten. Yet France flourished greatly under her: she solaced the people according to her father's dying wish; she also with vigorous and triumphant hand overcame the rivalry of Maximilian of Austria, and the selfish opposition of the princes. She it was who enabled Henry of Richmond to seize the throne of England, and to give peace to that troubled realm; she it was who defeated the allies at the battle of St. Aubin du Cormier (1488), thereby asserting the power of France against Brittany; she it was who compelled Maximilian, in the treaty of Sablé, to close the struggle, and to leave the French monarchy in peace. Finally, it was she who out-manœuvred Maximilian in his wooing of Anne of Brittany, and secured the great prize, the heiress and her lands, for her brother Charles. In 1491 the marriage took place which led to the eventual absorption (in 1515) of Brittany into the kingdom of France. After this "Madame la Grande," as this noble lady was rightly styled, withdrew from public life, leaving the country in a healthier state than it had been in for ages, leaving also to the young king a splendid army and a well-filled treasury.

Anne of France as regent.

The Italian expeditions begin.

With her disappearance from the scene, the controlling hand is lost, and France begins the age of her Italian expeditions, which, while they introduced her into the general arena of modern politics, and formed the platform on which the rivalry between the houses of France and Austria displayed itself, also influenced the home-life of France disastrously, and exhausted resources and energies so much needed for the wholesome development of the country. The Italian wars led to the civil wars, and they, in the end, cleared the ground for the despotism of Louis XIV.

When the house of Anjou came to an end in 1481, and Anjou and Maine fell in to the crown, there fell in also a far less valuable piece of property—the claim of that house, descended from Charles the youngest brother of St. Louis, on the kingdom of Naples and Sicily. There was much to tempt an ambitious prince in the state of Italy. Savoy, which held the passage into the peninsula, was then thoroughly French in sympathy; Milan, under Lodovico Sforza, "il Moro," was in alliance with Charles; Genoa preferred the French to the Aragonese claimants for influence over Italy; the popular feeling in the cities, especially in Florence, was opposed to the despotism of the Medici, and turned to France for deliverance; the misrule of the Spanish kings of Naples had made Naples thoroughly discontented; Venice was, as of old, the friend of France. Tempted by these reasons, in 1494 Charles VIII. set forth for Italy with a splendid host. He displayed before the eyes of Europe the first example of a modern army, in its three well-balanced branches of infantry, cavalry, and artillery. There was nothing in Italy to withstand his onslaught; he swept through the land in triumph; Charles believed himself to be a great conqueror, giving law to admiring subject-lands; he entered Pisa, Florence, Rome, itself. Wherever he went, his heedless ignorance, and the gross misconduct of his followers, left behind implacable hostility, 1495-1501. and turned all friendship into bitterness. At last he entered Naples, and seemed to have asserted to the full the French claim to be supreme in Italy, whereas at that very time his position had become completely untenable. A league of Italian states was formed behind his back; Lodovico il Moro, Ferdinand of Naples, the emperor, Pope Alexander VI., Ferdinand and Isabella, who were now welding Spain into a great and united monarchy, all combined against France; and in presence of this formidable confederacy, Charles VIII. had to cut his way home as promptly as he could. At Fornovo, north of the Apennines, he defeated the allies in July, 1495; and by November the main French army had got safely out of Italy. The forces left behind in Naples were worn out by war and pestilence, and the poor remnant of these, too, bringing with them the seeds of horrible contagious diseases, forced their way back to France in 1496. It was the last effort of the king. His health was ruined by debauchery in Italy, repeated in France; and yet towards the end of his reign he not merely introduced Italian arts, but attempted to reform the state, to rule prudently, to solace the poor; wherefore when he died in 1498 the people lamented him greatly, for he had been kindly and affable, brave also on the battle-field; and much is forgiven to a king.

Louis XII. His children died before him, so that Louis of Orleans, his cousin, was nearest heir to the throne, and succeeded as Louis XII. By his accession in 1498 he reunited the fief of Orleans county to the crown; by marrying Anne of Brittany, his predecessor's widow, he secured also the great duchy of Brittany. The dispensation of Pope Alexander VI., which enabled him to put away his wife Jeanne, second daughter of Louis XI., was brought into France by Cæsar Borgia, who gained thereby his title of duke of Valentinois, a large sum of money, a French bride, and promises of support in his great schemes in Italy.

As a younger man Louis XII. had been idle and dissipated; and to the end self-indulgence clung to him, as a Nessus-shirt, eating into his bones. Yet he was kindly and humane to his people, friendly and without revenge or malice, even in the case of those who had done him most mischief. His reign was the reversal of all the principles of Louis XI. That prince had avoided foreign complications, and had sternly repressed his nobles at home: Louis XII. began at once to interfere in foreign politics, and desired to strengthen the great nobles round the throne. The days were good for France, with this cheerful "pater patriæ" ruling over it. He tried to govern with economy and care, and to develop the resources of the country: it is said that one-third of the realm was brought under cultivation in his time. His ministers were men of real ability. George of Amboise, archbishop of Rouen, the chief of them, was a prudent and sagacious ruler, who, however, unfortunately wanted to be pope, and urged the king in the direction of Italian politics, which he would have done much better to have left alone. Louis XII. was lazy and of small intelligence; George of Amboise and Cæsar Borgia with their Italian ambitions easily made him take up a spirited foreign policy which was disastrous at home. Louis XII. had different aims in Italy from those of Charles VIII. His grandfather Louis had married, in 1389, Valentina Visconti, daughter of Gian Galeazzo, duke of Milan; and it had been agreed that if the duke had no male heirs, Milan should pass to the descendants of Valentina. This had now taken place; and Louis XII., as Valentina's grandson, claimed the duchy; he also asserted his rights to the Two Sicilies. Utterly as the last Italian expedition had failed, the French people were not yet weary of the adventure, and preparations for a new war began at once. In 1499 the king crossed the Alps into the Milanese, and carried all before him for a while. The duchy at first accepted him with enthusiasm; but in 1500 it had had enough of the French and recalled Lodovico, who returned in triumph to Milan. The Swiss mercenaries, however, betrayed him at Novara into the hands of Louis XII., who carried him off to France. The triumph of the French in 1500 was also the highest point of the fortunes of their ally Cæsar Borgia, who seemed for a while to be completely successful. In this year Louis made a treaty at Granada, by which he and Ferdinand the Catholic agreed to despoil Frederick of Naples; and in 1501 Louis made a second expedition into Italy. Again all seemed easy at the outset, and he seized the kingdom of Naples without difficulty; falling out, however, with his partner in the bad bargain, Ferdinand the Catholic, he was speedily swept completely out of the peninsula, with terrible loss of honor, men, and wealth. 1504-1514.

It now became necessary to arrange for the future of France. Louis XII. had only a daughter, Claude, and it was proposed that she should be affianced to Charles of Austria, the future statesman and emperor. This scheme formed the basis of the three treaties of Blois (1504). In 1500, by the treaty of Granada, Louis had in fact handed Naples over to Spain; now by the three treaties he alienated his best friends, the Venetians and the papacy, while he in fact also handed Milan over to the Austrian house, together with territories considered to be integral parts of France. The marriage with Charles came to nothing; the good sense of some, the popular feeling in the country, the open expressions of the States-General of Tours in 1506, worked against the marriage, which had no strong advocate except Queen Anne. Claude, on intercession of the Estates, was affianced to Francis of Angoulême, her distant cousin, the heir presumptive to the throne.

In 1507 Louis made war on Venice; and in the following year the famous treaty of Cambrai was signed by George of Amboise and Margaret of Austria. It was an agreement for a partition of the Venetian territories,—one of the most shameless public deeds in history. The pope, the king of Aragon, Maximilian, Louis XII., were each to have a share. The war was pushed on with great vigor: the battle of Agnadello (14th May, 1509) cleared the king's way towards Venice; Louis was received with open arms by the north Italian towns, and pushed forwards to within sight of Venice. The other princes came up on every side; the proud "Queen of the Adriatic" was compelled to shrink within her walls, and wait till time dissolved the league. This was not long. The pope, Julius II., had no wish to hand northern Italy over to France; he had joined in the shameless league of Cambrai because he wanted to wrest the Romagna cities from Venice, and because he hoped entirely to destroy the ancient friendship between Venice and France. Successful in both aims, he now withdrew from the league, made peace with the Venetians, and stood forward as the head of a new Italian combination, with the Swiss for his fighting men. The strife was close and hot between pope and king; Louis XII. lost his chief adviser and friend George of Amboise, the splendid churchman of the age, the French Wolsey; he thought no weapon better than the dangerous one of a council, with claims opposed to those of the papacy; first a national council at Tours, then an attempted general council at Pisa, were called on to resist the papal claims. In reply Julius II. created the Holy League of 1511, with Ferdinand of Aragon, Henry VIII. of England, and the Venetians, as its chief members, against the French. Louis XII. showed vigor; he sent his nephew Gaston of Foix to subdue the Romagna and threaten the Venetian territories. At the battle of Ravenna in 1512, Gaston won a brilliant victory and lost his life. From that moment disaster dogged the footsteps of the French in Italy, and before winter they had been driven completely out of the peninsula; the succession of the Medicean pope, Leo X., to Julius II. seemed to promise the continuance of a policy hostile to France in Italy. Another attempt on northern Italy proved but another failure, although now Louis XII., taught by his mishaps, had secured the alliance of Venice; the disastrous defeat of La Tremoille near Novara (1513) compelled the French once more to withdraw beyond the Alps. In this same year an army under the duke of Longueville, endeavoring to relieve Therouenne, besieged by the English and Maximilian, the emperor-elect, was caught and crushed at Guinegate. A diversion in favor of Louis XII., made by James IV. of Scotland, failed completely; the Scottish king was defeated and slain at Flodden Field. While his northern frontier was thus exposed, Louis found equal danger threatening him on the east; on this side, however, he managed to buy off the Swiss who had attacked the duchy of Burgundy. He was also reconciled with the papacy and the house of Austria. Early in 1514 the death of Anne of Brittany his spouse, a lady of high ambitions, strong artistic tastes, and humane feelings towards her Bretons, but a bad queen for France, cleared the way for changes. Claude, the king's eldest daughter, was now definitely married to Francis of Angoulême, and invested with the duchy of Brittany; and the king himself, still hoping for a male

1515.

heir to succeed him, married again, wedding Mary Tudor, the lovely young sister of Henry VIII. This marriage was probably the chief cause of his death, which followed on New Year's Day, 1515. His was, in foreign policy, an inglorious and disastrous reign; at home, a time of comfort and material prosperity. Agriculture flourished, the arts of Italy came in, though (save in architecture) France could claim little artistic glory of her own; the organization of justice and administration was carried out; in letters and learning France still lagged behind her neighbors.

Francis I.

His character and aims.

The heir to the crown was Francis of Angoulême, great-grandson of that Louis of Orleans who had been assassinated in the bad days of the strife between Burgundians and Armagnacs, in 1407, and great-great-grandson of Charles V. of France. He was still very young, very eager to be king, very full of far-reaching schemes. Few things in history are more striking than the sudden change at this moment, from the rule of middle-aged men or (as men of fifty were then often called) old men, to the rule of youths,—from sagacious, worldly-prudent monarchs to impulsive boys,—from Henry VII. to Henry VIII., from Louis XII. to Francis I., from Ferdinand to Charles. On the whole Francis I. was the least worthy of the three. He was brilliant, "the king of culture," apt scholar in Renaissance art and immorality; brave also and chivalrous, so long as the chivalry involved no self-denial, for he was also thoroughly selfish, and his personal aims and ideals were mean. His reign was to be a reaction from that of Louis XII.; Francis should set the monarchy once more upright, and secure its autocratic development. He reversed his predecessor's home policy, and was hailed with wild delight by the young nobles, who had found Louis XII. too sparing of gifts. Gifts they wanted now, not power; and they preferred a prince who gave while he crushed them to one who prudently forbore to give while he allowed them to retain their strength. The reputation of Francis I. is infinitely beyond his deserts; his reign was a real misfortune for France, and led the way to the terrible waste and mismanagement which mark her history throughout the century. For Francis was an altogether shallow person: he could not read the character of his great antagonist Charles V., nor the meaning of the vast movement which was but now beginning to develop itself out of, and to take the place of, the Renaissance. He wasted all the energies of France on bootless foreign wars: never has any land been so sinned against as France; her vast wealth of resources, her intelligent and thrifty people, her commanding central position, were all as nothing to her rulers in comparison with that most wasteful and disastrous of snares, a spirited foreign policy.

The concordat of Francis I.

From the beginning Francis chose his chief officers unwisely: in Antoine du Prat, his new chancellor, he had a violent and lawless adviser; in Charles of Bourbon, his new constable, an untrustworthy commander. Forthwith, he plunged into Italian politics, being determined to make good his claim both to Naples and to Milan; he made most friendly arrangements with the archduke Charles, his future rival, promising to help him in securing, when the time came, the vast inheritances of his two grandfathers, Maximilian the emperor-elect, and Ferdinand of Aragon: never was a less wise agreement entered on. This done, the Italian war began; Francis descended into Italy, and won the brilliant battle of Marignano, in which the French chivalry crushed the Swiss burghers and peasant mercenaries. The French then overran the north of Italy, and, in conjunction with the Venetians, carried all before them. But the triumphs of the sword were speedily wrested from him by the adroitness of the politician; in an interview with Leo X. at Bologna, Francis bartered the liberties of the Gallican Church for shadowy advantages in Italy: the Pragmatic Sanction of Bourges, which now for nearly a century had secured to the Church of France independence in the choice of her chief officers, was replaced by a concordat, whereby the king allowed the papacy once more to drain the wealth of the Church of France, while the pope allowed the king almost autocratic power over it. He was to appoint to all benefices, with exception of a few privileged offices; the pope was no longer to be threatened with general councils, while he should receive again the annates of the church.

1516-1529.

The struggle for the empire.

The years which followed this brilliantly-disastrous opening brought little good to France. In 1516 the death of Ferdinand the Catholic placed Charles on the throne of Spain; in 1519 the death of Maximilian threw open to the young princes the most dazzling prize of human ambition, the headship of the Holy Roman Empire. Francis I., Charles, and Henry VIII. were all candidates for the votes of the seven electors, though the last never seriously entered the lists. The struggle lay between Francis, the brilliant young prince, who seemed to represent the new opinions in literature and art, and Charles of Austria and Spain, who was as yet unknown and despised, and, from his education under the virtuous and scholastic Adrian of Utrecht, was thought likely to represent the older and reactionary opinions of the clergy. After a long and sharp competition, the great prize fell to Charles, henceforth known to history as that great monarch and emperor Charles V.

The rivalry of Charles V. and Francis I.

The battle of Pavia.

The Treaty of Cambrai.

The rivalry between the princes could not cease there. Charles, as representative of the house of Burgundy, claimed all that had been lost when Charles the Bold fell; and in 1521 war broke out between him and Francis, the first of a series of struggles between the two rivals. While the king wasted the resources of his country on these wars, his proud and unwise mother, Louise of Savoy, guided by Antoine du Prat, ruled, to the sorrow of all, at home. The war brought no glory with it: on the Flemish frontier a place or two was taken; in Biscay Fontarabia fell before the arms of France; in Italy Francis had to meet a new league of pope and emperor, and his troops were swept completely out of the Milanese. In the midst of all came the defection of that great prince the Constable Bourbon, head of the younger branch of the Bourbon house, the most powerful feudal lord in France. Louise of Savoy had enraged and offended him, or he her; the king slighted him, and in 1523 the constable made a secret treaty with Charles V. and Henry VIII., and, taking flight into Italy, joined the Spaniards under Lannoy. The French, who had again invaded the Milanese, were again driven out in 1524; on the other hand the incursions of the imperialists into Picardy, Provence, and the south-east were all complete failures. Encouraged by the repulse of Bourbon from Marseilles, Francis I. once more crossed the Alps, and overran a great part of the valley of the Po; at the siege of Pavia he was attacked by Pescara and Bourbon, utterly defeated and taken prisoner (24th February, 1525); the broken remnants of the French were swept out of Italy at once, and Francis I. was carried into Spain, a captive at Madrid. His mother, best in adversity, behaved with high pride and spirit; she overawed disaffection, made preparations for resistance, looked out for friends on every side. Had Francis been in truth a hero, he might even as a prisoner have held his own; but he was unable to bear the monotony of confinement, and longed for the pleasures of France. On this mean nature Charles V. easily worked, and made the captive monarch sign the treaty of Madrid (January 14, 1526),—a compact which Francis meant to break as soon as he could, for he knew neither heroism nor good faith. The treaty stipulated that Francis should give up the duchy of Burgundy to Charles, and marry Eleanor of Portugal, Charles's sister; that Francis should also abandon his claims on Flanders, Milan, and Naples, and should place two sons in the emperor's hands as hostages. Following the precedent of Louis XI. in the case of Normandy, he summoned an assembly of nobles and the parliament of Paris to Cognac, where they declared the cession of Burgundy to be impossible. He refused to return to Spain, and made alliances wherever he could,—with the pope, with Venice, Milan, and England. The next year saw the ruin of this league in the discomfiture of Clement VII. and the sack of Rome by the German mercenaries under Bourbon, who was killed in the assault. The war went on till 1529, when Francis having lost two armies in it, and gained nothing but loss and harm, was willing for peace; Charles V., alarmed at the progress of the Turks, was not less willing; and in August, 1529, the famous Treaty of Cambrai, "the Ladies' Peace," was agreed to by Margaret of Austria and Louise of Savoy. Though Charles V. gave up all claim on the duchy of Burgundy, he had secured to himself Flanders and Artois, and had entirely cleared French influences out of Italy, which

1529-1541.

now became firmly fixed under the imperial hand, as a connecting link between his Spanish and his German possessions. Francis lost ground and credit by these successive treaties, conceived in bad faith, and not honestly carried out. His whole policy, throughout, was tortuous and uncertain; he was misled by showy advantages, and not sufficiently sagacious to discern his true interests. He had in fact little grasp of the great movements of his age, and floated to and fro; neither from the enthusiasm of the Reformation, nor from the instinctive loyalty of his subjects, nor even from the threatening power of Charles, could he succeed in creating for himself a consistent and honorable policy. His Italian ambitions proved a fatal hinderance to his reign; in hopes of recovering Milan, for example, he let Charles delude him, and displeased his natural allies. His foreign alliances were insecure; he would not evoke the sympathy and help of his own people.

No sooner had the treaty of Cambrai been effectual in bringing his sons back to France, than Francis began to look out for new pretexts and means for war. Affairs were not unpromising. His mother's death in 1531 left him in possession of a huge fortune, which she had wrung from defenceless France; the powers which were jealous of Austria, the Turk, the English king, the members of the Smalkald league, all looked to Francis as their leader; Clement VII., though his misfortunes had thrown him into the emperor's hands, was not unwilling to treat with France; and in 1533 by the compact of Marseilles the pope broke up the friendship between Francis and Henry VIII., while he married his niece Catherine de' Medici to Henry, the second son of Francis. This compact was a real disaster to France; the promised dowry of Catherine,—certain Italian cities,—was never paid, and the death of Clement VII. in 1534 made the political alliance with the papacy a failure. The influence of Catherine affected and corrupted French history for half a century. Preparations for war went on; Francis made a new scheme for a national army, though in practice he preferred the tyrant's arm, the foreign mercenary. From his day till the Revolution the French army was largely composed of bodies of men tempted out of other countries, chiefly from Switzerland or Germany.

Catherine de' Medici.

While the emperor strove to appease the Protestant princes of Germany by the peace of Kadan (1534), Francis strengthened himself with a definite alliance with Soliman; and when on the death of Francesco Sforza, duke of Milan, who left no heirs, Charles seized the duchy as its over-lord, Francis, after some bootless negotiation, declared war on his great rival (1536). His usual fortunes prevailed so long as he was the attacking party: his forces were soon swept out of Piedmont, and the emperor carried the war over the frontier into Provence. That also failed, and Charles was fain to withdraw after great losses into Italy. The defence of Provence—a defence which took the form of a ruthless destruction of all its resources—had been entrusted to Anne of Montmorency, who henceforward became constable of France and exerted great influence over Francis I. Though these two campaigns, the French in Italy and the imperialist in Provence, had equally failed in 1536, peace did not follow till 1538, when, after the terrible defeat of Ferdinand of Austria by the Turks, Charles was anxious to have free hand in Germany. Under the mediation of Paul III. the agreement of Nice was come to, which included a ten years' truce, and the abandonment by Francis of all his foreign allies and aims. He seemed a while to have fallen completely under the influence of the sagacious emperor. He gave way entirely to the church party of the time, a party headed by gloomy Henry, now dauphin, who never lost the impress of his Spanish captivity, and by the constable Anne of Montmorency; for a time the artistic or Renaissance party, represented by Anne duchess of Étampes and Catherine de' Medici, fell into disfavor. The emperor even ventured to pass through France, on his way from Spain to the Netherlands. All this friendship, however, fell to dust, when it was found that Charles refused to invest the duke of Orleans, the second son of Francis, with the duchy of Milan, and when the emperor's second expedition against the sea-power of the Turks had proved a complete failure, and Charles had returned to Spain with loss of all his fleet and army. Then Francis hesitated no longer, and declared war against him (1541). The shock the emperor had suffered inspirited all his foes; the sultan and the Protestant German princes were all eager for war; the influence of Anne of Montmorency had to give way before that of the house of Guise, that frontier-family, half French, half German, which was destined to play a large part in the troubled history of the coming half-century. Claude, duke of Guise, a veteran of the earliest days of Francis, was vehemently opposed to Charles and the Austro-Spanish power, and ruled in the king's councils. This last war was as mischievous as its predecessors: no great battles were fought; in the frontier affairs the combatants were about equally fortunate; the battle of Cerisolles, won by the French under Enghien (1544), was the only considerable success they had, and even that was almost barren of results, for the danger to northern France was imminent; there a combined invasion had been planned and partly executed by Charles and Henry VIII.; and the country, almost undefended, was at their mercy. The two monarchs, however, distrusted one another; and Charles V., anxious about Germany, sent to Francis proposals for peace from Crespy Couvrant, near Laon, where he had halted his army; Francis, almost in despair, gladly made terms with him. The king gave up his claims on Flanders and Artois, the emperor his on the duchy of Burgundy; the king abandoned his old Neapolitan ambition, and Charles promised one of the princesses of the house of Austria, with Milan as her dower, to the duke of Orleans, second son of Francis. The duke dying next year, this portion of the agreement was not carried out. The peace of Crespy, which ended the wars between the two great rivals, was signed in autumn, 1544, and like the wars which led to it was indecisive and lame. Charles learnt that with all his great power he could not strike a fatal blow at France; France ought to have learnt that she was very weak for foreign conquest, and that her true business was to consolidate and develop her power at home. Henry VIII. deemed himself wronged by this independent action on the part of Charles, who also had his grievances with the English monarch; he stood out till 1546, and then made peace with Francis, with the aim of forming a fresh combination against Charles. In the midst of new projects, and much activity, the marrer of man's plots came on the scene, and carried off in the same year, 1547, the English king and Francis I., leaving Charles V. undisputed arbiter of the affairs of Europe. In this same year he also crushed the Protestant princes at the battle of Mühlberg.

1541-1547.

The Guise family.

The peace of Crespy.

Francis reigned long enough to have been able to do much for France, and, following Louis XII., might have been another "father of his country," setting it in the way of true grandeur and prosperity. And something of this he seemed to see. He liked in the great movements of the age to take that middle course which commends itself to France: like France herself he wished to be Catholic and yet to become champion of the Reformed cause; he loved letters and art; he was a brilliant and chivalrous personage, who had the French qualities strongly marked in character and action. His people felt that he, in the main, represented them; they honored and loved him as a part of themselves. They accepted their position as a united nation—united, that is, under a master who offered them no constitutional rights or liberties; it was enough for them that their master was good-natured and kindly; his vices and weaknesses were little blamed, and much followed. History will record that he was mean and selfish, false and licentious, and that, if he knew what was the nobler path for himself and his country, he could not rise to the heroism of following it, when to do so demanded self-denial. History ought also to remember that he was pitted against the ablest statesman of his age, and that he was called on, with insufficient knowledge and strength, to defend the liberties of Europe against an overwhelming power. That he failed to choose the right weapons, that he failed to make the best use of the weapons he did take up—this was the real weakness of his life. His reign filled those years in which Renaissance passed into Reformation—in which the new enthusiasm for art and letters made the way ready for a more grave and solemn enthusiasm in religion, an enthusiasm which in its simpler side aimed at restoring purity of faith and manners, while in its more extreme developments it mixed itself up with bold political theories, or with a condemnation of all that learning and culture could do for human life. Under the direct kingship of God, men believed that all the older usages,

The character of his reign.

1547.

restrictions, and political principles of life were out of place. The Anabaptists carried out, in harsh developments, many of the ideas proclaimed half a century before by Savonarola at Florence. Now, in the history of France no principle appears so well established as this, that she ever "subordinated her religious feelings to her political interests." It is almost as generally true that her political interests were ever subordinated to the personal interests of her leaders. Consequently, we shall always expect to find very little movement of public opinion in France, and only a weak influence of religious sentiment on the general current of affairs; we shall also find her appreciation of political interests weak and ill-informed, her desire for self-government at home as dimly felt as her desire for a right policy abroad; and lastly, we shall see that for ages her history is the history of men not of institutions, and that her worst struggles are caused by personal not national questions. It is one of the grand results of the Revolution that it raised France from this vicious moral and mental state, introducing the rule of ideas and opinions, and the general participation of citizens in their own affairs.

Why the Reformation failed in France.

In the reign of Francis I. the court looked not unkindly on the Reformers, more particularly in the earlier years, while the new opinions were mostly those of Luther. Margaret, the king's sister, the duchess of Étampes, his mistress, Renée of France, the daughter of Louis XII., who took Clement Marot as her secretary, and was a declared Protestant,—all these ladies patronized and protected the Reformers. The king himself, regarding them as a people having ideas and some education and enlightenment, was well inclined towards them for a time. Later on, the excesses of the image-breakers, and the tendency of some of them to depreciate carnal learning, entirely alienated him from them. He never had any religious sympathy with them; and though both he and his mother sided in the beginning with the learned world against the monks and "hypocrites," as Louise of Savoy calls them, they never were interested in those theological questions which, though they might seem to them often to degenerate into unmeaning subtleties, still in reality gave to the reforming movement its true strength. The nobles went with the court, and beyond it. About half the great families with more or less earnestness adopted the Reformed opinions, and that more specially in their second or Calvinistic development. With them went a not inconsiderable body of the upper clergy. With these strong elements in its favor, how did the Reformation come to fail in France? It failed, first because the general body of the people took absolutely no interest in the matter; no popular feeling had been aroused; no discontent with either the clergy or the monasteries existed; and the people, uneducated and unused to political controversy or expression, were in fact never called on to form a judgment in the matter. Personal religion, or personal judgment as to theological questions, even in their more practical bearings, was but little known or cared for in France. And this was true not only of the people, but of the nobles and the court. There was, too, a want of that wholesome cathartic effect which the Reformation worked elsewhere; men's lives became no purer, the family relation was not strengthened, and from the moral side the movement was a failure also. Lastly, France has few great cities though many small ones, and her cities had little or no use of independence of thought and opinion. The towns were much divided; the capital, with its preponderating influence, was distinctly hostile to the Reformers. The Champagne towns, specially Meaux, showed themselves favorable to the new opinions; in the rest of France they had little sway; the persistent piety of the hill country of the south-east and south was an entirely independent phenomenon, which seemed to exert very little influence on the rest of France. In the later days of Francis I., the politico-religious movement connected with the name of Calvin, the series of ideas which formed the basis of Latin Protestantism, as distinct from the Germanic movement of the north, spread over a great part of the south and west of France. It was warmly welcomed by the dissidents of Dauphiny, the Cevennes, the Garonne valley; the nobles also adopted it with enthusiasm. It became a disruptive force in France. While Paris and northern France cling to the old opinions, round which a good number of the great families group themselves, Poitou and the western provinces are the home of the new ideas in church and state. They utter opinions which combine reform in religion with aristocratic and republican views in politics. France thus divided falls a prey to civil war.

1547-1552.

Henry II.

Henry II., who succeeded in 1547, "had all the faults of his father, with a weaker mind;" and as strength of mind was not one of the characteristics of Francis I., we may imagine how little firmness there was in the gloomy king who now reigned. Party spirit ruled at court. Henry II., with his ancient mistress Diana of Poitiers, was at the head of one party, that of the strict Catholics, and was supported by old Anne of Montmorency, most unlucky of soldiers, most fanatical of Catholics, and by the Guises, who chafed a good deal under the stern rule of the constable. This party had almost extinguished its antagonists; in the struggle of the mistresses, the pious and learned Anne of Étampes had to give place to imperious Diana. Catherine, the queen, was content to bide her time, watching with Italian coolness the game as it went on; of no account beside her rival, and yet quite sure to have her day, and ready to play parties against one another. Meanwhile, she brought to her royal husband ten sickly children, most of whom died young, and three wore the crown. Of the many bad things she did for France, that was perhaps among the worst.

Parties at court.

Mary queen of Scots.

On the accession of Henry II. the duchy of Brittany finally lost even nominal independence; he next got the hand of Mary queen of Scots, then but five years old, for the dauphin Francis; she was carried over to France, and being by birth half a Guise, by education and interests of her married life she became entirely French. It was a great triumph for Henry, for the protector Somerset had laid his plans to secure her for young Edward VI.; it was even more a triumph for the Guises, who saw opened out a broad and clear field for their ambition.

At first Henry II. showed no desire for war, and seemed to shrink from rivalry or collision with Charles V. He would not listen to Paul III., who, in his anxiety after the fall of the Protestant power in Germany in 1547, urged him to resist the emperor's triumphant advance; he seemed to show a dread of war, even among his neighbors. After he had won his advantage over Edward VI., he escaped the war which seemed almost inevitable, recovered Boulogne from the English by a money-payment, and smoothed the way for peace between England and Scotland. He took much interest in the religious question, and treated the Calvinists with great severity; he was also occupied by troubles in the south and west of France. Meanwhile a new pope, Julius III., was the weak dependant of the emperor, and there seemed to be no head left for any movement against the universal domination of Charles V. His career from 1547 to 1552 was, to all appearance, a triumphal march of unbroken success. Yet Germany was far from acquiescence; the princes were still discontented and watchful; even Ferdinand of Austria, his brother, was offended by the emperor's anxiety to secure everything, even the imperial crown, for his son Philip; Maurice of Saxony, that great problem of the age, was preparing for a second treachery, or, it may be, for a patriotic effort. These German malcontents now appealed to Henry for help; and at last Henry seemed inclined to come. He had lately made alliance with England, and in 1552 formed a league at Chambord with the German princes; the old connection with the Turk was also talked of. The Germans agreed to allow him to hold (as imperial vicar, not as king of France), the "three bishoprics," Metz, Verdun, and Toul; he also assumed a protectorate over the spiritual princes, those great bishops and electors of the Rhine, whose stake in the empire was so important. The general lines of French foreign politics are all here clearly marked; in this Henry II. is the forerunner of Henry IV. and of Louis XIV.; the imperial politics of Napoleon start from much the same lines; the proclamations of Napoleon III. before the Franco-German war seemed like thin echoes of the same.

Maurice of Saxony.

Early in 1552 Maurice of Saxony struck his great blow at his master in the Tyrol, destroying in an instant all the emperor's plans for the suppression of Lutheran opinions, and the reunion of Germany in a Catholic empire; and while Charles V. fled for his life, Henry II. with a splendid army crossed the frontiers

1552-1558.

of Lorraine. Anne of Montmorency, whose opposition to the war had been overborne by the Guises, who warmly desired to see a French predominance in Lorraine, was sent forward to reduce Metz, and quickly got that important city into his hands; Toul and Verdun soon opened their gates, and were secured, in reality if not in name, to France. Eager to undertake a protectorate of the Rhine, Henry II. tried also to lay hands on Strasburg; the citizens, however, resisted, and he had to withdraw; the same fate befell his troops in an attempt on Spires. Still Metz and the line of the Vosges mountains formed a splendid acquisition for France. The French army, leaving strong garrisons in Lorraine, withdrew through Luxemburg and the northern frontier; its remaining exploits were few and mean, for the one gleam of good fortune enjoyed by Anne of Montmorency, who was unwise and arrogant, and a most inefficient commander, soon deserted him. Charles V., as soon as he could gather forces, laid siege to Metz, but, after nearly three months of late autumnal operations, was fain to break up and withdraw, baffled and with loss of half his army, across the Rhine. Though some success attended his arms on the northern frontier, it was of no permanent value: the loss of Metz, and the failure in the attempt to take it, proved to the worn-out emperor that the day of his power and opportunity was past. The conclusions of the diet of Augsburg in 1555 settled for half a century the struggle between Lutheran and Catholic, but settled it in a way not at all to his mind; for it was the safeguard of princely interests against his plans for an imperial unity. Weary of the losing strife, yearning for ease, ordered by his physicians to withdraw from active life, Charles in the course of 1555 and 1556 resigned all his great lordships and titles, leaving Philip his son to succeed him in Italy, the Netherlands, and Spain, and his brother Ferdinand of Austria to wear in his stead the imperial diadem. These great changes sundered a while the interests of Austria from those of Spain.

Charles V. lays down his dignities.

Henry endeavored to take advantage of the check in the fortunes of his antagonists; he sent Anne of Montmorency to support Gaspard Coligny, the admiral of France, in Picardy, and in harmony with Paul IV., instructed Francis, duke of Guise, to enter Italy to oppose the duke of Alva. As of old, the French arms at first carried all before them, and Guise deeming himself heir to the crown of Naples (for he was the eldest great-grandson of René II., titular king of Naples) pushed eagerly forward as far as the Abruzzi. There he was met and outgeneraled by Alva, who drove him back to Rome, whence he was now recalled by urgent summons to France; for the great disaster of St. Quentin had laid Paris itself open to the assault of an enterprising enemy. With the departure of Guise from Italy the age of the Italian expeditions comes to an end. On the northern side of the realm things had gone just as badly. Philibert of Savoy, commanding for Philip with Spanish and English troops, marched into France as far as to the Somme, and laid siege to St. Quentin, which was bravely defended by Admiral Coligny. Anne of Montmorency, coming up to relieve the place, managed his movements so clumsily that he was caught by Count Egmont and the Flemish horse, and with incredibly small loss to the conquerors, was utterly routed (1557). Montmorency himself and a crowd of nobles and soldiers were taken; the slaughter was great. Coligny made a gallant and tenacious stand in the town itself, but at last was overwhelmed, and the place fell. Terrible as these mishaps were to France, Philip II. was not of a temper to push an advantage vigorously; and while his army lingered, Francis of Guise came swiftly back from Italy; and instead of wasting strength in a doubtful attack on the allies in Picardy, by a sudden stroke of genius he assaulted and took Calais (January, 1558), and swept the English finally off the soil of France. This unexpected and brilliant blow cheered and solaced the afflicted country, while it finally secured the ascendency of the house of Guise. The duke's brother, the cardinal of Lorraine, carried all before him in the king's councils; the dauphin, betrothed long before, was now married to Mary of Scots; a secret treaty bound the young queen to bring her kingdom over with her; it was thought that France with Scotland would be at least a match for England joined with Spain. In the same year, 1558, the French advance along the coast, after they had taken Dunkirk and Nieuport, was finally checked by the brilliant genius of Count Egmont, who defeated them at Gravelines. All now began to wish for peace, especially Montmorency, weary of being a prisoner, and anxious to get back to court, that he might check the fortunes of the Guises; Philip desired it, that he might have free hand against heresy. And so at Cateau Cambresis a peace was made in April, 1559, by which France retained the three bishoprics and Calais, surrendering Thionville, Montmédy, and one or two other frontier towns, while she recovered Ham and St. Quentin; the house of Savoy was reinstated by Philip, as a reward to Philibert for his services, and formed a solid barrier for a time between France and Italy; cross marriages between Spain, France, and Savoy were arranged; and finally the treaty contained secret articles by which the Guises for France and Granvella for the Netherlands agreed to crush heresy with the strong hand. As a sequel to this peace, Henry II. held a great tournament at Paris, at which he was accidentally slain by a Scottish knight in the lists.

1559-1560.

Peace of Cateau Cambresis.

Francis II.

The Guises now shot up into unbounded power. The new king, Francis II., was devoted to his young wife, and she was entirely led by her uncles the Guises; so strong they seemed that Philip of Spain was alarmed lest Mary Stewart should also win the English crown, and he allowed the accession of Queen Elizabeth, in consequence of his fears, to pass unchallenged. As yet, parties at court were not marked simply by their theological views; that would follow in time. On the Guise side the cardinal of Lorraine was the cleverest man, the true head, while Francis the duke was the arm; he showed leanings towards the Lutherans. On the other side the head was the dull and obstinate Anne of Montmorency, the constable, an unwavering Catholic, supported by the three Coligny brothers, who all were or became Huguenots. The queen-mother, Catherine, fluctuated uneasily between the parties, and though Catholic herself, or rather not a Protestant, did not hesitate to befriend the Huguenots, if the political arena seemed to need their gallant swords. Their noblest leader was Coligny the admiral; their recognized head was Antony king of Navarre, a man as foolish as fearless. He was heir presumptive to the throne after the Valois boys, and claimed to have charge of the young king. Though the Guises had the lead at first, the Huguenots seemed, from their strong aristocratic connections, to have the fairer prospects before them.

The civil wars.

Thirty years of desolate civil strife are before us, and we must set it all down briefly and dryly. The prelude to the troubles was played by the Huguenots, who in 1560, guided by La Renaudie, a Perigord gentleman, formed a plot to carry off the young king; for Francis II. had already treated them with considerable severity, and had dismissed from his councils both the princes of the blood royal and the Constable Montmorency. The plot failed miserably, and La Renaudie lost his life; it only secured more firmly the authority of the Guises. As a counterpoise to their influence, the queen-mother now conferred the vacant chancellorship on one of the wisest men France has ever seen, her Lord Bacon, Michel L'Hôpital, a man of the utmost prudence and moderation, who, had the times been better, might have won constitutional liberties for his country, and appeased her civil strife. As it was, he saved her from the Inquisition; his hand drew the edicts which aimed at enforcing toleration on France; he guided the assembly of notables which gathered at Fontainebleau, and induced them to attempt a compromise which moderate Catholics and Calvinists might accept, and which might lessen the power of the Guises. This assembly was followed by a meeting of the States-General at Orleans, at which the prince of Condé and the king of Navarre were seized by the Guises on a charge of having had to do with La Renaudie's plot. It would have gone hard with them had not the sickly king at this very time fallen ill and died (1560).

Charles IX.

This was a grievous blow to the Guises; they had their hands on their rivals, and would have got rid of them in a few days; they had laid their plans to crush the south, and put down the Huguenots by martial law; the queen-mother was powerless, the middle party behind her was as nothing. Now, as in a moment, all was shattered; Catherine de' Medici rose at once to the command of affairs; the new king, Charles IX., was only ten years old, and her position as regent was assured. The Guises would gladly have ruled with her; but she had no fancy for that; she and Chancellor L'Hôpital were not likely

1560-1562.

to ally themselves with all that was severe and repressive. Still, parties made a kind of armistice for a while; the queen-mother drew towards easy-tempered Antony of Navarre; the Guises retained much of their power; Condé was set free; the extremer measures proposed by the Huguenots, who wished the king of Navarre to seize the regency for himself, were not regarded with any favor. While the Guises had been omnipotent, the discontented parties excluded by them from power and office were held together by the bonds of a common adversity; the change of affairs loosened their friendship. They fell into three groups:—the princes of the blood, with the queen-mother; the constable Anne of Montmorency and his Catholic friends; and thirdly, the Huguenot nobles and cities of the south and west. The princes of the blood, through Antony of Navarre, had close connections with the Huguenots; and when the queen-mother had secured him, she doubtless deemed that she would at least be able to neutralize their influence on affairs. She therefore set herself to secure also the constable and his party, and created a kind of triumvirate (composed of herself, Antony of Navarre, and Anne of Montmorency), with which she hoped to rule the country, and to keep the Guises in check. Here was a splendid field for those intrigues in which she had her being; yet the queen's ultimate aim was a good one, for she really desired the tranquillity of France, and hoped to see Catholics and Huguenots dwelling like brethren side by side. It must not be forgotten that the best part of her policy was inspired by the Chancellor L'Hôpital.

Now it was that Mary Stewart, the queen-dowager, was compelled to leave France for Scotland; her departure clearly marks the fall of the Guises, and it also showed Philip of Spain that it was no longer necessary for him to refuse aid and counsel to the Guises; their claims were no longer formidable to him on the larger sphere of European politics; no longer could Mary Stewart dream of wearing the triple crown of Scotland, France, and England.

The triumvirate.

The tolerant language of L'Hôpital at the States-General of Orleans in 1561 satisfied neither side. The Huguenots were restless; the Bourbon princes tried to crush the Guises, in return for their own imprisonment the year before; the constable was offended by the encouragement shown to the Huguenots; it was plain that new changes impended. Montmorency began them by going over to the Guises; and the fatal triumvirate of Francis, duke of Guise, Montmorency, and St. André, the marshal, was formed. We find the king of Spain forthwith entering the field of French intrigues and politics, as the support and stay of this triumvirate. Parties take a simpler form at once,—one party of Catholics, and another of Huguenots, with the queen-mother and the moderates left powerless between them. These last, guided still by L'Hôpital, once more convoked the States-General at Pontoise: the nobles and the third estate seemed to side completely with the queen and the moderates; a controversy between Huguenots and Jesuits at Poissy only added to the discontent of the Catholics, who were now joined by foolish Antony king of Navarre. The edict of January, 1562, is the most remarkable of the attempts made by the queen-mother to satisfy the Huguenots; but party-passion was already too strong for it to succeed; civil war had become inevitable. The recall of the duke of Guise from Lorraine by his party made an outbreak certain. The Guises themselves were not without Lutheran sympathies; their border-position between France and Germany, their literary tastes, and relations with German princes, made this natural enough. Still they were Catholics, and Lutheran sympathies were very different from Huguenot politics. The sudden outbreak at Vassy on the borders of Champagne, which marked the entry of the Guises into France proper, and the murder of Huguenots in the granary in which they were holding service,—a massacre condemned by Francis of Guise himself,—mark the opening of the civil wars (1st March, 1562). The period may be divided into four parts:—(1) the wars before the establishment of the League (1562–1570); (2) the period of the St. Bartholomew (1570–1573); (3) the struggle of the new Politique party against the Leaguers (1573–1589); (4) the efforts of Henry IV. to crush the League and reduce the country to peace (1589–1598). The period can also be divided by that series of agreements, or peaces, which break it up into eight wars.

Periods of the civil wars.

1562–1569.

The first war.

1. The war of 1562, on the skirts of which Philip of Spain interfered on the one side, and Queen Elizabeth with the Calvinistic German princes on the other, showed at once that the Huguenots were by far the weaker party. The English troops at Havre enabled them at first to command the lower Seine up to Rouen; but the other party, after a long siege which cost poor Antony of Navarre his life, took that place, and relieved Paris of anxiety. The Huguenots had also spread far and wide over the south and west, occupying Orleans; the bridge of Orleans was their point of junction between Poitou and Germany. While the strength of the Catholics lay to the east, in Picardy, and at Paris, the Huguenot power was mostly concentrated in the south and west of France. Condé, who commanded at Orleans, supported by German allies, made an attempt on Paris, but finding the capital too strong for him, turned to the west, intending to join the English troops from Havre. Montmorency, however, caught him at Dreux; and in the battle that ensued the marshal of France, St. André, perished; Condé was captured by the Catholics, Montmorency by the Huguenots. Coligny, the admiral, drew off his defeated troops with great skill, and fell back to beyond the Loire; the duke of Guise remained as sole head of the Catholics. Pushing on his advantage, the duke immediately laid siege to Orleans, and there he fell by the hand of a Huguenot assassin. Both parties had suffered so much that the queen-mother thought she might interpose with terms of peace; the edict of Amboise (March, 1563) closed the war, allowing the Calvinists freedom of worship in the towns they held, and some other scanty privileges. A three years' quiet followed, though all men suspected their neighbors, and the high Catholic party tried hard to make Catharine sacrifice L'Hôpital and take sharp measures with the Huguenots. They on their side were restless and suspicious, and it was felt that another war could not be far off. Intrigues were incessant, all men thinking to make their profit out of the weakness of France. The struggle between Calvinists and Catholics in the Netherlands roused much feeling, though Catherine refused to favor either party. She collected an army of her own; it was rumored that she intended to take the Huguenots by surprise, and annihilate them. In autumn, 1567, their patience gave way, and they raised the standard of revolt, in harmony with the heroic Netherlanders. Condé and the Châtillons beleaguered Paris from the north, and fought the battle of St. Denis, in which the old constable Anne of Montmorency was killed. The Huguenots, however, were defeated and forced to withdraw, Condé marching eastwards to join the German troops now coming up to his aid. No more serious fighting followed; the peace of Longjumeau (March, 1568) closed the second war, leaving matters much as they were. The aristocratic resistance against the Catholic sovereigns, against what is often called "the Catholic Reaction," had proved itself hollow; in Germany and the Netherlands, as well as in France, the Protestant cause seemed to fail; it was not until the religious question became mixed up with questions as to political rights and freedom, as in the Low Countries, that a new spirit of hope began to spring up.

The second war.

The peace of Longjumeau gave no security to the Huguenot nobles; they felt that the assassin might catch them any day. An attempt to seize Condé and Coligny failed, and served only to irritate their party; Cardinal Châtillon escaped to England; Jeanne of Navarre and her young son Henry took refuge at La Rochelle; L'Hôpital was dismissed the court. The queen-mother seemed to have thrown off her cloak of moderation, and to be ready to relieve herself of the Huguenots by any means, fair or foul. War accordingly could not fail to break out again before the end of the year. Condé had never been so strong; with his friends in England and the Low Countries, and the enthusiastic support of a great party of nobles and religious adherents at home, his hopes rose; he even talked of deposing the Valois and reigning in their stead. He lost his life, however, early in 1569, at the battle of Jarnac. Coligny once more with difficulty, as at Dreux, saved the broken remnants of the defeated Huguenots. Condé's death, regarded at the time by the Huguenots as an irreparable calamity, proved in the end to be no serious loss; for it made room for the true head of the party, Henry of Navarre. No sooner had Jeanne of Navarre heard of the mishap of Jarnac than she came into the Huguenot

The third war.

camp, and presented to the soldiers her young son Henry and the young prince of Condé, a mere child. Her gallant bearing and the true soldier-spirit of Coligny, who shone most brightly in adversity, restored their temper; they even won some small advantages. Before long, however, the duke of Anjou, the king's youngest brother, caught and punished them severely at Moncontour. Both parties thenceforward wore themselves out with desultory warfare. In August, 1570, the peace of St. Germain-en-Laye closed the third war, and ended the first period.

2. It was the most favorable peace the Huguenots had won as yet; it secured them, beside previous rights, four strongholds. The Catholics were dissatisfied; they could not sympathize with the queen-mother in her alarm at the growing strength of Philip II., head of the Catholics in Europe; they dreaded the existence and growing influence of a party now beginning to receive a definite name, an honorable nickname, the Politiques. These were that large body of French gentlemen who loved the honor of their country rather than their religious party, and who, though Catholics, were yet moderate and tolerant. The day will come when they will assert themselves as the true patriot party, and, supporting Henry IV., will find out a solution for the vexed questions and the troubles of their times.

The Politiques.

On the other hand, the Huguenots were frightened by the peace, and regarded its favorable terms as baits and snares. They withdrew sullenly to La Rochelle; the friendly attitude of Charles IX. alarmed them still more; they were scarcely reassured by seeing him ally himself with the house of Austria, then not friendly with Spain. A pair of marriages now proposed by the court amazed them still more. It was suggested that the duke of Anjou should marry Queen Elizabeth of England, and Henry of Navarre Margaret of Valois, the king's sister. Charles IX. hoped thus to be rid of his brother whom he disliked, and to win powerful support against Spain, by the one match, and by the other to bring the civil wars to a close. The sketch of a far-reaching resistance to Philip II. was drawn out; so convinced of his good faith was the prudent and sagacious William of Orange, that on the strength of these plans he refused good terms now offered him by Spain. There seems no doubt that whatever the subtle Catharine may have thought and meant, Charles IX. was sincere. Catherine cared more for her favorite son Henry of Anjou than for the king, whom she despised; she took no pleasure in those schemes for helping the Netherlanders in their revolt, by which Charles hoped to occupy his Huguenot subjects, while he preserved peace at home. She seems all this while to have wished to see some half dozen Huguenot leaders assassinated; thereby she thought the party would be neutralized. She was far from pleased at the ascendency which Coligny, from the moment the king saw him, exercised in the royal councils. The duke of Alençon, the remaining son of Catherine, the brother who did not come to the throne, was deeply interested in the plans for a war in the Netherlands; Anjou, who had withdrawn from the scheme of marriage with Queen Elizabeth, was at this moment a candidate for the throne of Poland; while negotiations respecting it were going on, Margaret of Valois was married to Henry of Navarre,—the worst of wives to a husband none too good. Coligny, who had strongly opposed the candidature of Anjou for the throne of Poland, was set on by an assassin, employed by the queen-mother and her favorite son, and badly wounded; the Huguenots were in utmost alarm, filling the air with cries and menaces. Charles showed great concern for his friend's recovery, and threatened vengeance on the assassins. What was his astonishment to learn that those assassins were his mother and brother! Catherine worked on his fears, and the plot for the great massacre was combined in an instant. The very next day after the king's consent was wrung from him, 24th August, 1572, the massacre of St. Bartholomew's day took place.

The St. Bartholomew.

The murder of Coligny was completed; his son-in-law Teligny perished; all the chief Huguenots were slain; the slaughter spread to country towns; the church and the civil power were at one, and the victims, taken at unawares, could make no resistance. The two Bourbons, Henry and the prince of Condé, were spared; they bought their lives by a sudden conversion to Catholicism. The chief guilt of this great crime lies with Catherine de' Medici; for though it is certain that she did not plan it long before, assassination was a recognized part of her way of dealing with Huguenots; only she was too fine to do it in the coarse and wholesale way of the St. Bartholomew. It is from her that the taste for murder in France chiefly sprang. The Guises may well share with her; they planned and executed the hasty act; they too had long dabbled in murder. The king's share in it was, like himself, weak and impulsive; he was the last to come in, the first to repent. The evil deed was highly applauded as a master-stroke by pope and Spanish king. Yet it soon became clear that the crime was a blunder also. The effects of it, startling for the moment, enabled the middle party to take the lead. The duke of Alençon never approved of the massacre; the moderates throughout France were shocked and outraged; the Huguenots, weakened for a while, were content to unite with the Politiques, and place themselves under their leading; Catherine lost her power of balancing between the parties, for they are now but two,—that of the League, and that of the rest of France.

The fourth war.

A short war followed, —a revolt of the southern cities rather than a war. They made tenacious and heroic resistance; a large part of the royal forces sympathized rather with them than with the League; and in July, 1573, the edict of Boulogne granted them even more than they had been promised by the peace of St. Germains.

The Wars of the League.

3. We have reached the period of the "Wars of the League," as the four later civils wars are often called. The last of the four is alone of any real importance.

Just as the peace of La Rochelle was concluded, the duke of Anjou, having been elected king of Poland, left France; it was not long before troubles began again. The duke of Alençon was vexed by his mother's neglect; as heir presumptive to the crown he thought he deserved better treatment, and sought to give himself consideration by drawing towards the middle party; Catherine seemed to be intriguing for the ruin of that party; nothing was safe while she was moving. The king had never held up his head since the St. Bartholomew; it was seen that he now was dying, and the queen-mother took the opportunity of laying hands on the middle party. She arrested Alençon, Montmorency, and Henry of Navarre, together with some lesser chiefs; in the midst of it all Charles IX. died (1574) in misery, leaving the ill-omened crown to Henry of Anjou, king of Poland, his next brother, his mother's favorite, the worst of a bad breed.

The fifth war.

At the same time the fifth civil war broke out, interesting chiefly because it was during its continuance that the famous League was actually formed.

Henry III.

Henry III., when he heard of his brother's death, was only too eager to slip away like a culprit from Poland, though he showed no alacrity in returning to France, and dallied with the pleasures of Italy for months. An attempt to draw him over to the side of the Politiques failed completely; he attached himself on the contrary to the Guises, and plunged into the grossest dissipation, while he posed himself before men as a good and zealous Catholic. The Politiques and Huguenots therefore made a compact in 1575, at Milhaud on the Tarn, and chose the prince of Condé as their head; Henry of Navarre escaped from Paris, threw off his forced Catholicism, and joined them. Against them the strict Catholics seemed powerless; the queen-mother closed this war with the peace of Chastenoy (May, 1576), with terms unusually favorable for both Politiques and Huguenots: for the latter free worship throughout France, except at Paris; for the chiefs of the former great governments,—for Alençon a large central district, for Condé Picardy, for Henry of Navarre Guienne.

The Catholic League.

To resist all this the high Catholic party framed the League they had long been meditating; it is said that the cardinal of Lorraine had sketched it years before, at the time of the later sittings of the council of Trent. Lesser compacts had already been made from time to time; now it was proposed to form one great league, towards which all should gravitate. The head of the League was Henry, duke of Guise, the second "Balafré," who had won that title in fighting against the German reiters the year before, when they entered France under Condé. He certainly hoped at this time to succeed to the throne of France, either by deposing the corrupt and feeble Henry III., "as Pippin dealt with Hilderik," or by seizing the throne, when the king's debaucheries should have brought him to the grave. The

1576-1584.

Catholics of the more advanced type, and specially the Jesuits, now in the first flush of credit and success, supported him warmly. The headquarters of the movement were in Picardy, its first object opposition to the establishment of Condé as governor of that province. The League was also very popular with the common folk, especially in the towns of the north. It soon found that Paris was its natural centre; thence it spread swiftly across the whole of France; it was warmly supported by Philip of Spain. The States-General, convoked at Blois in 1576, could bring no rest to France; opinion was just as much divided there as in the country; and the year 1577 saw another petty war, counted as the sixth, which was closed by the peace of Bergerac, another ineffectual truce, which settled nothing.

The sixth war.

It was a peace made with the Politiques and Huguenots by the court; it is significant of the new state of affairs that the League openly refused to be bound by it, and continued a harassing, objectless warfare. The duke of Anjou (he had taken that title on his brother Henry's accession to the throne) in 1578 deserted the court party, towards which his mother had drawn him, and made friends with the Calvinists in the Netherlands. The southern provinces named him "Defender of their liberties;" they had hopes he might wed Elizabeth of England; they quite mistook their man.

The seventh war.

In 1579 "the Gallants' War" broke out; the Leaguers had it all their own way; but Henry III., not too friendly to them, and, urged by his brother Anjou, to whom had been offered sovereignty over the seven United Provinces in 1580, offered the insurgents easy terms, and the treaty of Fleix closed the seventh war. Anjou in the Netherlands could but show his weakness; nothing went well with him; and at last, having utterly wearied out his friends, he fled, after the failure of his attempt to secure Antwerp, into France. There he fell ill of consumption, and died in 1584.

This changed at once the complexion of the succession question. Hitherto, though no children seemed likely to be born to him, Henry III. was young and might live long, and his brother was there as his heir. Now, Henry III. was the last prince of the Valois, and Henry of Navarre in hereditary succession was heir presumptive to the throne, unless the Salic law were to be set aside.

The descent of Henry of Navarre.

The fourth son of St. Louis, Robert, count of Clermont, who married Beatrix, heiress of Bourbon, was the founder of the house of Bourbon. Of this family the two elder branches had died out:—John, who had been a central figure in the war of the Public Weal, in 1488; Peter, husband of Anne of France, in 1503; neither of them leaving heirs male. Of the younger branch Francis died in 1525, and the famous Constable Bourbon in 1527. This left as the only representatives of the family the counts of La Marche; of these the elder had died out in 1438, and the junior alone survived in the counts of Vendôme. The head of this branch, Charles, was made duke of Vendôme by Francis I. in 1515; he was father of Antony, duke of Vendôme, who, by marrying the heroic Jeanne of Albret, became king of Navarre, and of Louis, who founded the house of Condé; lastly, Antony was the father of Henry IV. He was therefore a very distant cousin to Henry III.; the houses of Capet, of Alençon, of Orleans, of Angoulême, of Maine, and of Burgundy, as well as the elder Bourbons, had to fall extinct before Henry of Navarre could become heir to the crown. All this, however, had now happened; and the Huguenots greatly rejoiced in the prospect of a Calvinist king. The Politique party showed no ill will towards him; both they and the court party declared that if he would become once more a Catholic they would rally to him; the Guises and the League were naturally all the more firmly set against him; and Henry of Navarre saw that he could not as yet safely endanger his influence with the Huguenots, while his conversion would not disarm the hostility of the League. They had before this put forward as heir to the throne Henry's uncle, the wretched old Cardinal Bourbon, who had all the faults and none of the good qualities of his brother Antony. Under cover of his name the duke of Guise hoped to secure the succession for himself; he also sold himself and his party to Philip of Spain, who was now in fullest expectation of a final triumph over his foes. He had assassinated William the Silent; any day Elizabeth or Henry of Navarre might be found murdered; the domination of Spain over Europe seemed almost secured.

1585-1589.

The pact of Joinville, signed between Philip, Guise, and Mayenne, gives us the measure of the aims of the high Catholic party.

The Sixteen of Paris.

Paris warmly sided with them; the new development of the League, the "Sixteen of Paris," one representative for each of the districts of the capital, formed a vigorous organization and called for the king's deposition; they invited Henry, duke of Guise, to Paris. Soon after this Henry III. humbled himself, and signed the treaty of Nemours (1585) with the Leaguers. He hereby became nominal head of the League, and its real slave.

The eighth war, the "War of the Three Henries."

The eighth war, the "War of the Three Henries," that is, of Henry III. and Henry of Guise against Henry of Navarre, now broke out. The pope made his voice heard; Sixtus excommunicated the Bourbons, Henry and Condé, and blessed the Leaguers. For the first time there was some real life in one of these civil wars; for Henry of Navarre rose nobly to the level of his troubles. At first the balance of successes was somewhat in favor of the Leaguers; the political atmosphere grew even more threatening, and terrible things, like lightning-flashes, gleamed out now and again. Such, for example, was the execution of Mary Stewart, queen of Scots, in 1586. It was known that Philip II. was preparing to crush England. Elizabeth did what she could to support Henry of Navarre; he had the good fortune to win the battle of Coutras, in which the duke of Joyeuse, one of the favorites of Henry III., was defeated and killed. The duke of Guise, on the other hand, was too strong for the Germans, who had marched into France to join the Huguenots, and defeated them at Vimory and Auneau, after which he marched in triumph to Paris, in spite of the orders and opposition of the king, who, finding himself powerless, withdrew to Chartres. Once more Henry III. was obliged to accept such terms as the Leaguers chose to impose; and with rage in his heart he signed the "Edict of Union" (1588), in which he named the duke of Guise lieutenant-general of the kingdom, and declared that no heretic could succeed to the throne. Unable to endure the humiliation, Henry III. that same winter assassinated the duke and the cardinal of Guise, and seized many leaders of the League, though he missed the duke of Mayenne. This scandalous murder of the "King of Paris," as the capital fondly called the duke, brought the wretched king no solace nor power. His mother did not live to see the end of her son; she died in this the darkest period of his career, and must have been aware that her cunning and her immoral life had brought nothing but misery to herself and all her race. The power of the League party seemed as great as ever; the duke of Mayenne entered Paris, and declared open war on Henry III., who, after some hesitation, threw himself into the hands of his cousin Henry of Navarre in the spring of 1589. The old Politique party now rallied to the king; the Huguenots were staunch for their old leader; things looked less dark for them since the destruction of the Spanish Armada in the previous summer. The Swiss, aroused by the threats of the duke of Savoy at Geneva, joined the Germans, who once more entered north-eastern France; the Leaguers were unable to make head either against them or against the armies of the two kings; they fell back on Paris, and the allies hemmed them in. The defence of the capital was but languid; the populace missed their idol, the duke of Guise, and the moderate party, never extinguished, recovered strength. All looked as if the royalists would soon reduce the last stronghold of the League, when Henry III. was suddenly slain by the dagger of a fanatical half-witted priest. The king had only time to commend Henry of Navarre to his courtiers as his heir, and to exhort him to become a Catholic, before he closed his eyes, and ended the long roll of his vices and crimes. And thus in crime and shame the house of Valois went down. For a few years the throne remained practically vacant: the heroism of Henry of Navarre, the loss of strength in the Catholic powers, the want of a vigorous head to the League,—these things all sustained the Bourbon in his arduous struggle; the middle party grew in strength daily, and when once Henry had allowed himself to be converted, he became the national sovereign, the national favorite, and the high Catholics fell to the fatal position of an unpatriotic faction depending on the arm of the foreigner.

Henry IV.

4. The civil wars were not over, for the heat of party raged as yet unslaked; the Politiques

1589-1590.

The claimants for the throne.

could not all at once adopt a Huguenot king, the League party had pledged itself to resist the heretic, and Henry at first had little more than the Huguenots at his back. There were also formidable claimants for the throne. Charles II., duke of Lorraine, who had married Claude, younger daughter of Henry II., and who was therefore brother-in-law to Henry IV., set up a vague claim; the king of Spain, Philip II., thought that the Salic law had prevailed long enough in France, and that his own wife, the elder daughter of Henry II., had the best claim to the throne; the Guises, though their head was gone, still hoping for the crown, proclaimed their sham-king the cardinal of Bourbon as Charles X., and intrigued behind the shadow of his name. The duke of Mayenne, their present chief, was the most formidable of Henry's opponents; his party called for a convocation of States-General, which should choose a king to succeed, or to replace, their feeble Charles X. During this struggle the high Catholic party, inspired by Jesuit advice, stood forward as the admirers of constitutional principles; they called on the nation to decide the question as to the succession; their Jesuit friends wrote books on the sovereignty of the people. They summoned up troops from every side; the duke of Lorraine sent his son to resist Henry and support his own claim; the king of Spain sent a body of men; the League-princes brought what force they could. Henry of Navarre at the same moment found himself weakened by the silent withdrawal from his camp of the army of Henry III.; the Politique nobles did not care at first to throw in their lot with the Huguenot chieftain; they offered to confer on Henry the post of commander-in-chief, and to reserve the question as to the succession; they let him know that they recognized his hereditary rights, and were hindered only by his heretical opinions; if he would but be converted, they were his. Henry temporized; his true strength, for the time, lay in his Huguenot followers, rugged and faithful fighting-men, whose belief was the motive-power of their allegiance and of their courage. If he joined the Politiques at their price, the price of declaring himself Catholic, the Huguenots would be offended if not alienated. So he neither absolutely refused nor said yes; and the chief Catholic nobles, in the main, stood aloof, watching the struggle between Huguenot and Leaguer, as it worked out its course.

Henry, thus weakened, abandoned the siege of Paris, and fell back; with the bulk of his forces he marched into Normandy, so as to be within reach of English succor; a considerable army went into Champagne, to be ready to join any Swiss or German help that might come. These were the great days of the life of Henry of Navarre. After the rough training of his boyhood, when his noble mother was no more, and he had become entangled with the dissolute Valois court, he had taken willing share in their debaucheries, and seemed no better than the rest; after he had secured his throne, he relapsed again into a scandalous life, which dimmed the lustre of his vigorous government. But now he was at his best; in the life of camps, the excitements of the battlefield, in the flashes of genius with which he fought successfully against heavy odds, Henry showed himself a hero, who strove for a great cause—the cause of European freedom—as well as for his own crown.

The duke of Mayenne followed the Huguenots down into the west, and found Henry awaiting him in a strong position at Arques, near Dieppe; here at bay the "Béarnais" inflicted a heavy blow on his assailants; Mayenne fell back into Picardy; the prince of Lorraine drew off altogether; and Henry marched back triumphantly to Paris, ravaged the suburbs, and then withdrew to Tours, where he was recognized as king by the parliament. His campaign of 1589 had been most successful; he had defeated the League in a great battle, thanks to his skilful use of his position at Arques, and the gallantry of his troops, which more than counterbalanced the great disparity in numbers. He had seen dissension break out among his enemies; even the pope, Sixtus V., had shown him some favor, and the Politique nobles were certainly not going against him. Early in 1590 Henry had secured Anjou, Maine, and Normandy, and in March defeated Mayenne in a great pitched battle at Ivry, not far from Dreux. The Leaguers fell back in consternation to Paris. Henry reduced all the country round the capital, and sat down before it for a stubborn siege. The duke of Parma had at that time his hands full in the Low Countries; young prince Maurice was beginning to show his great abilities as a soldier, and had got possession of Breda; all, however, had to be suspended by the Spaniards on that side, rather than let Henry of Navarre take Paris. Parma with great skill relieved the capital without striking a blow, and the campaign of 1590 ended in a failure for Henry. The success of Parma, however, made Frenchmen feel that Henry's was the national cause, and that the League flourished only by interference of the foreigner. Were the king of Navarre but a Catholic, he should be a king of France of whom they might all be proud. This feeling was strengthened by the death of the old Cardinal Bourbon, which re-opened at once the succession question, and compelled Philip of Spain to show his hand. He now claimed the throne for his daughter Elizabeth, as eldest daughter of the eldest daughter of Henry II. All the neighbors of France claimed something; Frenchmen felt that it was either Henry IV. or dismemberment. The "Béarnais" grew in men's minds to be the champion of the Salic law, of the hereditary principle of royalty against feudal weakness, of unity against dismemberment, of the nation against the foreigner.

1590-1598.

The middle party, the Politiques of Europe,—the English, that is, and the Germans,—sent help to Henry, by means of which he was able to hold his own in the north-west and south-west throughout 1591. Late in the year the violence of the Sixteen of Paris drew on them severe punishment from the duke of Mayenne; and consequently the duke ceased to be the recognized head of the League, which now looked entirely to Philip II. and Parma, while Paris ceased to be its headquarters; and more moderate counsels having taken the place of its fierce fanaticism, the capital came under the authority of the lawyers and citizens, instead of the priesthood and the bloodthirsty mob. Henry meanwhile, who was closely beleaguering Rouen, was again outgeneralled by Parma, and had to raise the siege. Parma, following him westwards, was wounded at Caudebec; and though he carried his army triumphantly back to the Netherlands, his career was ended by this trifling wound. He did no more, and died in 1592.

The conversion of Henry IV.

In 1593, Mayenne having sold his own claims to Philip of Spain, the opposition to Henry looked more solid and dangerous than ever; he therefore thought the time was come for the great step which should rally to him all the moderate Catholics. After a decent period of negotiation and conferences, he declared himself convinced, and heard mass at St. Denis. The conversion had immediate effect; it took the heart out of the opposition; city after city came in; the longing for peace was strong in every breast, and the conversion seemed to remove the last obstacle. The Huguenots, little as they liked it, could not oppose the step, and hoped to profit by their champion's improved position. Their ablest man, Sully, had even advised Henry to make the plunge. In 1594 Paris opened her gates to Henry, who had been solemnly crowned, just before, at Chartres. He was welcomed with immense enthusiasm, and from that day onwards has ever been the favorite hero of the capital. By 1595 only one foe remained,—the Spanish court. The League was now completely broken up; the parliament of Paris gladly aided the king to expel the Jesuits from France. In November, 1595, Henry declared war against Spain, for anything was better than the existing state of things, in which Philip's hand secretly supported all opposition. The war in 1596 was far from being successful for Henry; he was comforted, however, by receiving at last the papal absolution, which swept away the last scruples of France.

War with Spain.

By rewards and kindliness,—for Henry was always willing to give and had a pleasant word for all,—most of the reluctant nobles, headed by the duke of Mayenne himself, came in in the course of 1596. Still the war pressed very heavily, and early in 1597 the capture of Amiens by the Spaniards alarmed Paris, and roused the king to fresh energies. With help of Sully (who had not yet received the title by which he is known to history) Henry recovered Amiens, and checked the Spanish advance. It was noticed that while the old Leaguers came very heartily to the king's help, the Huguenots hung back in a discontented and suspicious spirit. After the fall of Amiens the war languished; the pope offered to mediate, and Henry had time to breathe. He felt that his old comrades the offended Huguenots had good cause for complaint; and in April, 1598, he issued the famous Edict of Nantes, which secured

The Edict of Nantes.

their position for nearly a century. They got toleration for their opinions; might worship openly in all places, with the exception of a few towns in which the League had been strong; were qualified to hold office in financial posts and in the law; had a Protestant chamber in the parliaments. The number of Huguenots is said to have been at this time rather over a million in all, though little trust can be put in figures; they were strong in Burgundy, Poitou, Saintonge, Provence, Guyenne, and Dauphiny; in the rest of France there were but few of them.

The treaty of Vervins.

Immediately after the publication of the Edict of Nantes the Treaty of Vervins was signed. Though Henry by it broke faith with Queen Elizabeth, he secured an honorable peace for his country, and undisputed kingship for himself. It was the last act of Philip II., the confession that his great schemes were unfulfilled, his policy a failure.

III. The Bourbon Monarchy.

1598 an epoch for France.

The year 1598 closes the mediæval history of France; henceforth she takes her part in modern history. The power of the feudal noblesse has passed away; the earlier rivalries between France and Austria take a new character; the centralized absolutist monarchy begins. We are coming to the days of the great ministers,—first Sully, then Richelieu, lastly Colbert, under whose rule France becomes great, almost in spite of her kings. The age now past had little to look back on with pleasure; the utter corruption of the court, reign after reign, the selfish partisanship of the nobles, and the harsh incidence of civil war, incline us to believe the age to have been thoroughly wretched. Yet the condition of the French people was less miserable than it had been; without seeing much prosperity we hear less of famine than in previous or in later ages; for civil wars do not so much exhaust the well-being of a country as might appear. It has been observed that the wars of the Roses did little to check the progress of England; and in like manner the wars of the League do not seem to have deeply afflicted France. These wars, in fact, were all the fighting of lords and princes with their retainers; they were languid and partial; and though their story might be wretched enough, the wretchedness of it chiefly fell on the heads of the belligerents themselves. There is no Jacquerie in this age, as in the 15th and as in the 18th century in France; and in some respects the country made a real advance. In arts she has never been really great, and her age of poetry was not yet come. Ronsard and Du Bartas, great as their reputation was once, do not rise into the first rank of poets, and there are no better names. In political and legal writings, on the other hand, we have the great names of Montaigne and L'Hôpital, of Bodin and Hottmann, of Cujas and Étienne Pasquier. Stephanus and Joseph Scaliger represent classical tastes and chronological investigation. Town-life was but little injured, except in Paris herself, by the wars of the period; and even Paris was not altogether the worse for them, for even Henry III. took an interest in the capital, and tried to develop its resources.

The *Christian Republic.*

Whether the *Christian Republic*, that great political romance, was ever laid before the eyes of Henry IV. we shall never know; at all events it represents, in a rather extreme form, the broader politics of modern history, and marks a great change in the relations of states. Many of its ideas were, consciously or not, adopted by the imperialism of our own century; for they favored the national vanity, which sought to impose its principles and wishes on Europe. It represented the resistance of France to the Austro-Spanish power, affirmed the general principle of toleration, endeavored to substitute a court of arbitration in place of war, recognized many different forms of government, and sought to weld all civilized Europe into one harmonious community. That it was a dream the world's history has plentifully proved; that there was in it much to admire, much to strive for, is equally proved by the persistence of many of its ideas, and their agreement with the best parts of the development of Europe in modern times.

Parties at Henry's court.

In 1598, on the close of the Spanish war, when Henry IV. was at last fully recognized as king of France on all sides, we find at his court representatives of the two policies which for ages contended for the possession of the great resources of the country. These were the Hispano-Catholic policy, which aimed at uniting French and Spanish interests against the north and west of Europe; and on the other side, the policy of the tolerant party, which desired to make France the leader of the Protestant and liberal part of Europe, which allied itself with the Dutch, with the North German Lutherans, with the English, with the Swedes. It is the glory of Sully, of Richelieu, and of Colbert, that they advanced the greatness of France by following the latter of these lines; whereas Louis XIV. lost power from the moment that he abandoned himself to the Spanish policy.

Maximilian of Bethune, duke of Sully.

So at Henry's court we find Maximilian of Bethune, lord of Rosny (he was not made duke of Sully till 1606), who headed the liberal party, the party of economy and good government, opposed to Villeroy, who represented the Spanish party, and seemed to have an equal share in the king's regard. Between these two were Jeannin, a great lawyer, and president of the Paris parliament, who worked with Sully and Sillery, who held a middle course, and was the most trusted diplomatist of his time. Villeroy and the Spanish advisers were strongly supported by the court, especially after the appearance of Mary de' Medici. The court of Spain was only too glad to thwart Henry where it could; the English court, after the accession of James, was too much set on windy schemes and grand impossibilities to afford a counterpoise on the other side. Sully had been made head of the finances in 1597, and had found everything in frightful disorder. His stern temper, severe manners, even his narrow grasp, proved him to be admirably suited for the part he had to play; a more enlightened statesman might have failed where he succeeded. We find in his finance no large views as to economic principles; we only see a rigid determination to stop waste, to punish thieves in high places, to make the taxes yield their full worth to the crown. So far as he occupied himself with general politics, Sully's views were right and liberal; he disliked the Spanish tendencies of the court, and did his best to keep his master clear of them. He could not make the king economical, or reduce the outgoings of the state; on the contrary, he felt himself obliged to make a strong army and plentiful artillery, and to accumulate good store of coin at the arsenal, so as to be ready for any need. In spite of these expenses, he speedily lessened the severity of the taxation; and as good government made tranquillity, and tranquillity plenty, France bore her burdens with increasing willingness and ability. The chief failure of Sully's administration lay in his having done nothing to equalize taxation, by compelling noble land to bear its share with the labor of the peasant. He laid on some new taxes, increased some of the worst of the existing imposts, reduced the amount of the public debt; and encouraged agriculture. Henry, who with all his faults had broader views than his finance minister, also did his best for manufactures; the edicts of the reign are numerous, and for the most part very sensible and helpful.

Biron's plot.

Mary de' Medici.

Though the civil wars were over before 1598, content had not returned to the country. Henry was often ungrateful to his old friends and loyal supporters; and the leaders of the Politique party, who might well think they had secured his throne for him, were especially dissatisfied. Consequently, when war broke out with the duke of Savoy in 1600 over some frontier question, the duke of Biron entered into a great plot with Savoy and Spain, and carried with him a formidable party of nobles. Sully, however, was prepared for all; his artillery and munitions of war were such as had never before been seen; and the duke of Savoy, seeing Montmélian, an impregnable stronghold, as it was deemed, actually taken, sued for peace. He retained Saluzzo, for Henry had no desire to meddle in Italian politics, and ceded to France Bresse and Bugey, Valromey and Gex, so securing French influences up to the very gates of Geneva, and making it certain that the duke of Savoy must never again hope to crush that vigorous republic. Just before the end of this war, his divorce from Margaret of Valois having come from the pope, Henry married Mary de' Medici (1600), then in the prime of her beauty; later on she grew fat and heavy. She was always stiff and obstinate, a prejudiced follower of the old ways, who spent her life first in thwarting, afterwards in obliterating, the traces of the higher schemes and acts of her spouse. The duke of Biron, utterly dissatisfied at the result of the Savoyard war, plunged into fresh conspiracy; then Henry IV. felt no more pity for him, but seized and beheaded him; it was believed that the queen herself was mixed up in his plot, which had far-reaching ramifications. By 1605 Henry had reduced all the rest of his recalcitrant nobles, treating them without rancor or revenge if they came in, and setting trusty officers of his own to watch over them.

The state of Europe.

Assassination of Henry IV.

The remainder of the king's life was occupied with two things:—first, the strengthening of the resources of France at home; secondly, the preparations for authoritative intervention in the affairs of Europe, which were now beginning to attract the attention of all. The king was called on to intervene as a mediator between the papacy and Venice in 1606–1607, and decided their quarrel in a way which ought to have roused the gratitude of the papal power. Chiefly through Henry's firmness, a truce for twelve years was signed between Spain and the United Provinces,—for the Spaniards, exhausted by the siege of Ostend, the greatest siege the world had ever seen (1601–1604), and quite unable to cope with the genius of Maurice of Nassau, gladly accepted the peaceful overtures of Olden Barneveldt and the commercial grandees of the towns, who then, as afterwards, were opposed to the democratic and war-loving population of the country, which supported the house of Orange. This truce closed the great struggle of the Low Countries for their independence, and virtually secured it to them. While, however, tranquillity reigned in Holland and Italy, Germany was growing ever more uneasy; in more districts than one the struggle between the communions, deferred not ended by the peace of Augsburg of 1555, had become acute. Not only in the Slavonic lands connected with the house of Austria were there excitement and disturbance, but in the Rhine districts questions had arisen which called out the warm interest of all the three confessions,—the Catholic, Lutheran, and Calvinistic. The death of the duke of Cleves in 1609 brought matters to a head; the Dutch and Spaniards, the elector of Brandenburg, and the emperor, all interfered. Then Henry IV. took up the cause of the Protestant princes, and sent envoys to the Evangelic Union of Halle (January, 1610), and made most vigorous preparations for war, in combination with Maurice of Nassau, who agreed to join him with 20,000 Dutchmen in Cleves. It was arranged that the queen should be regent in the king's absence, and as she had never been solemnly crowned, she delayed Henry's departure till that ceremony had taken place; in the days of waiting the king, fretting to be off, went to visit Sully, who lay ill at the Arsenal, and to feast his eyes once more on the splendid armory and munitions of war collected there. As he went, he was assassinated by Ravaillac, who plunged a knife into his heart. It is said to have been the eighteenth attempt made on his life. All the grand plans for interference in the affairs of Europe, and for the reduction of the house of Austria, fell to the ground at once, and German affairs were left to seethe as they would, until in 1618–1619 they came to a head in the outbreak of the Thirty Years' War. The knife of Ravaillac, whether he was set on by the queen and the Spanish party or not, did their work; it left the Protestants of the north to fight for themselves, relieved the king of Spain of grave anxieties, and plunged France once more into confusion and trouble. Not till the reign of Richelieu had succeeded the administration of Sully did France resume her true direction and lead the resistance to the house of Austria.

Character of Henry IV.

Henry IV. had the great quality of individuality. He stands out fresh and clear as a distinct personage, of high soul, bright temper, original and characteristic speech. All great men leave sayings behind them, and Henry's ring with vigorous good nature and humor. His brilliancy in war was that of a captain; he had not the coolness and combination of a general; his moral character was restless, bad, ungrateful, self-indulgent; he took little trouble to help his subjects to greater comfort, though he ever wished them well. They felt that there was in him something of the lazy kindliness of Louis XII. He chose a grand minister in Sully, and, in spite of some wavering, followed him in the right policy for France. He had the faults of the Bourbons; yet he was their greatest king,—on the whole, their noblest man.

Voltaire sums up the good deeds of his reign in nervous phrases:—

> "Justice is reformed, and—far harder task!—the two religions live in peace—to all appearance. Agriculture is encouraged; as Sully said, 'Plough and cow, these are the breasts of France, whereat she sucks; they are the true mines and treasures of Peru.' Commerce and the arts, which Sully cared for less, were still honored; gold and silver stuffs enriched Lyons and France. Henry established manufactures of tapestry; French glass after the Venetian style began to be made. To him alone France owes the silk-worm and the mulberry, in spite of Sully. It was Henry who dug the canal which joins the Seine and the Loire. Under him Paris grew and grew fair; he built the Place Royale, he rebuilt the old bridges. Before his day the St. Germain suburb was not connected with the town, and was improved; he saw to that. He built that fine bridge on which every Frenchman as he passes still looks up with emotion at his statue. St. Germain, Monceaux, Fontainebleau, above all the Louvre, were enlarged, almost rebuilt, by him. He established in his long gallery in the Louvre artists of all kinds, and encouraged them frequently with his presence as well as his presents."

Finally, he had made France the arbiter of Europe, as was felt at Venice and Amsterdam, and as would have been also felt on the Rhine, had not the Spanish faction, and the undying hatred of the Catholic fanaticism, cut short his life on the very eve of great events.

Louis XIII. and the regency.

The States-General of 1614.

The regency in France belonged in theory to the princes of the blood-royal; as, however, Catharine de' Medici had made her a precedent, and as Henry IV. had as good as named his spouse regent, Marie de' Medici seized the office at once. She took no vengeance on Sully for his opposition to her in past time, but made friends with him, taking from him all real power and command of the finances, while she left him the charge of the artillery and woods, together with the government of Poitou. The princes of the blood-royal were easily disposed of: Condé was in exile, the prince of Conti a cipher; the count of Soissons she quieted with great gifts. Then she composed a council of regency, which was managed by her favorites Concini and his wife Leonora Galigai. Concini, who purchased the marquisate of Ancre, and was made marshal, though an ambitious and greedy foreigner, did not use his power amiss for a time. When the princes, headed by Condé, opposed him and clamored for the convocation of the States-General, Concini quieted them skilfully, and in 1614 caused the young king's majority to be declared,—for Louis XIII. was then thirteen years old,—and summoned the States-General to meet at Paris. As this was the last time that they were called together before the eve of the Revolution, it may be well to say a word as to the body, its nature and composition. The States-General of France, in which the three orders met from time to time at invitation of the king, was an assembly of clergy, nobles, and "third estate" or commons. The three formed three entirely independent chambers, sitting, debating, and voting separately. Consequently the vote of two orders could always veto the wishes of the third; and as clergy were a class and nobles a caste, and as to a large extent the interests of these bodies were identical, and as, moreover, they both enjoyed a fatal immunity from the burdens of taxation, the chance of legislation or taxation on fair principles was very small indeed. Representing the clerical estate sat the bishops and abbots, together with a certain number of lower clergy: in the noble house sat the holders of noble fiefs; the third estate was represented (except in 1789) chiefly by deputies elected in the towns. These bodies had really no legislative power; and though just before the Revolution the parliament of Paris opened the way to great changes by declaring that taxes could only be legally voted by the States-General, they had, as a fact, very little authority even in this respect; in only a few cases did they sanction taxation or vote subsidies; the royal power found it more convenient, till the bankrupt state of the country under Louis XVI. compelled it to call on the Estates for help, to arrange the taxation as it thought good. The great doctrine of the relation between tax-paying and political power was unknown in France. The true function of the Estates seemed to be limited to expressions of opinion on points submitted to them by the king, and to the laying before him, on their side, grievances which they had brought up in their *cahiers* or "quires," from the country. These grievances they could not remedy: all they could do was solemnly to call the attention of the king to them, who could redress them if he liked. This solemn process was almost the only occasion on which the Estates met together. They went to church together at the opening, and then in one chamber were met by the king, who addressed them and dismissed them to their several chambers with the business he chose to entrust to their deliberations; then, once more, at the end of their labors they all met again. At the upper end of the hall a platform was erected for the king and his court, the twelve peers, and the household officers; on the right hand of it sat the clergy, on the left the nobles, in front, at the foot of the hall, the third estate. Each order presented its statement of grievances; the king replied with promises and assurances, which came to very little, and the Estates were then dismissed; and if the court had got the money or the help it sought, very little more was thought about gravamina to be redressed. So little was their practical importance,—so rarely were they convoked, that their composition, method of election or nomination, rules of procedure, rights and legislative competency, were never made clear. It was not in the interests of the monarchy, or indeed of the privileged orders, that the Estates should have any power, or meet very often.

Parliament in France.

This, then, was all that France, before the Revolution, ever had by way of what Englishmen call a parliament. The word parliament in France has always signified only a law court; and the parliament of Paris, the chief law court of the realm, claimed a certain constitutional power, as having the duty of registering the royal edicts. As a rule, it proved itself the obsequious servant of the king's will; from time to time, however, it was stubborn, and, refusing to register, held that the royal edict so unregistered was void of authority. In such cases the king was wont to hold what was curiously styled a "lit de justice," a "bed of justice," or solemn visitation of the parliament, in which he personally attended and compelled the reluctant body to register his edict.

Pays d'élection.

These things, for the "generalities" or "Pays d'élection,"—that is, for the chief part of France,—were the sum total of constitutional life and power enjoyed,—a total which, under a strong and determined monarch, or such a minister as Richelieu, meant absolutely nothing at all.

Pays d'états.

In the outlying districts, called the "Pays d'états," more liberties existed; these parts voted their own local taxation, and managed to a great extent their own local affairs; they were, however, a mere fringe round the borders of ancient France,—the estate of Flanders (namely Douai and Lille), Provence, Béarn, Lower Navarre, Bigorre, Foix, Soule, Armagnac, Nébouzan, and Marsan.

Richelieu appears.

The States-General of 1614 did nothing; they faithfully represented the jealousies and ill-will between the orders, and broke up in confusion. Armand du Plessis of Richelieu, bishop of Luçon, was the orator of the clergy on this occasion, the person charged to lay the grievances of his order before the king. This is the only interesting fact in the history of this meeting of the Estates. In 1615 Louis XIII. married Anne of Austria, who afterwards played a considerable part in the troubles of the Fronde. For two years Marshal Ancre steered his perilous way between the young king, who cared little for him,—his mother's favorite, not his,—the princes of the blood, and the discontented Huguenots. In 1617 the new favorite of Louis, Charles d'Albert, count of Luynes, overthrew and killed him; Leonora Galigai, his wife, was executed as a sorceress; the queen-mother and Richelieu, who was just hoping to secure his foothold at court, both fell,—she withdrew to Blois, he to Luçon; the young king, weak and frivolous, fell into the hands of the noblesse. After a time the nobles were as little pleased with Luynes as they had been with Concini, and rallied round the court of Mary de' Medici at Angers. Richelieu, whose great abilities had already been recognized, was charged by Luynes with the delicate task of attempting a reconciliation between the king and his mother; he succeeded by the treaty of Angers in 1620 in averting civil war. Then Luynes, thinking it well to amuse the king, marched with him into Béarn, where the inhabitants, suddenly bereft (in 1617) of their rights as Protestants, were in open ferment and revolt. Here, as in all the south and west of France, the Huguenots were uneasy and suspicious; the incidents of war in Bohemia, where the Calvinists had but just been crushed, and the political changes in the United Provinces, excited their already high-wrought feelings. They claimed the full benefit of the Edict of Nantes, which seemed to the court to be the establishment of a republic in the heart of the monarchy. In 1621 they held an assembly at their capital, La Rochelle, and made a kind of declaration of independence. They divided their 700 congregations throughout France into eight circles, after the German fashion, thus indicating a tendency towards decentralization, which must be offensive to the court and the general body of French people; they arranged their own levies of men and money, and in fact went far towards the full organization of what they styled "the republic of the Reformed churches of France and Béarn." They named the duke of Bouillon their chief, and made Lesdiguières most plentiful offers. These great nobles, however, refused to join them, and the duke of Rohan with his brother Soubise became the heads of this Huguenot movement. There were in it not a few elements of constitutional life; these Protestants had a far better idea of wholesome government than prevailed elsewhere in France. The noblesse, however, would have nothing to do with them, and their efforts were of little avail. The king, who showed considerable energy, took the command against them, and encouraged his army to treat them with barbarous cruelty, for he was a weak and heartless creature. At the siege of Montauban, however, he failed completely, and had to withdraw discomfited. Soon after this, in the end of 1621, Luynes was taken with camp fever and died. The king, who was weary of him, heard with pleasure the tidings of his death. Round him were now formed two parties,—that of the queen-mother upheld by Richelieu, and that of the prince of Condé. The king, leaning towards the latter, which wished for war, set forth on a second campaign against the Huguenots, and conducted it with the same mischievous cruelty as before. The Huguenots showed nothing but weakness; their chief men submitted, and place after place fell. After this war had lasted about a year, the queen-mother got the upper hand at court, and Condé had to withdraw; by a treaty which recalled the old peaces of the civil wars, the chief part of the Edict of Nantes was confirmed, while the Huguenots were forbidden to hold political meetings or to fortify towns; they retained only La Rochelle and Montauban as strongholds (October, 1623).

Richelieu begins to rule.

Richelieu, who in 1622 had received the cardinal's hat in reward of his services in reconciling the king with his mother, was now ready to take charge of and to rule the weak, unstable king, who already appeared to fear and dislike his future master. He entered the council in April, 1624.

His policy.

"I venture on nothing without first thinking it out; but once decided, I go straight to my point, overthrow or cut down whatever stands in my way, and finally cover it all up with my cardinal's red robe." Such are the words put into Richelieu's mouth; and whether he said them or not, they represent fairly enough his deliberation, resolution, and cold severity. Nor does the final touch as to the red robe of his clerical office go much beyond the truth; for he made great use of his dignity as a cardinal to cover the intrigues and cruelties on which otherwise he might perhaps have never ventured. In his earlier days he seems to have desired to build up a strong monarchy, absolute, without constitutional checks, on the goodwill of a satisfied and well-governed people. The alliance between despotism and democracy, which our own age has also seen, appeared to be especially adapted for France, where the constitutional life was always so weak. As soon, however, as the despotism was established on a firm footing, the people were forgotten; and Richelieu's administration in the end oppressed them quite as much as it crushed the nobles or kept the church in order.

His earlier history.

When Richelieu entered the king's council in 1624 he was thirty-nine years old. Born in 1585, he was the youngest son of a noble family of Poitou, springing originally from the village of Richelieu. In that family the elder son, if he chose, took orders, because they could always dispose of the bishopric of Luçon, a kind of family benefice; the younger son became a soldier. As such, Armand du Plessis learnt lessons in warfare, which were very useful to him at a later time; the cardinal's robe did not take the place of the soldier's coat,—it only concealed it. When, however, his brother gave up his preferment at Luçon, Armand at once left the calling of a soldier, was ordained, and succeeded to the bishopric in 1607, at the age of twenty-two. The States-General of 1614 made the young prelate's fortune; he pleased Concini and the queen-mother, acted with consummate skill and pru-

1624-1626.
Periods of his career.

dence through the ten years which followed, was made cardinal in 1622, and member of the council in 1624. His later life may be divided into four periods:—(1) from 1624 to 1626, the time of his first resistance against the Austro-Spanish power and his failure, as shown by the peace of Monzon; (2) from 1626 to 1628, when he punished the Huguenots of La Rochelle for that failure, and laid firmer foundations for his after-success; (3) from 1628 to 1635, the period in which he secured his own and his master's despotism in France, and began to interfere in the affairs of Europe; and lastly (4), from 1635 to 1643, the days of his successful lead in the arena of general politics, and of his triumphant overthrow of his domestic foes; the fruits of this period he left for Mazarin to gather in abroad by his triumphs at the peace of Westphalia; Louis XIV. carried out his principles to their utmost development in domestic policy.

First period of his public career.

1. When he began to rule in 1624, the Austro-Spanish power had already become very strong. The first results of the Thirty Years' War were all in their favor; they held the Palatinate and the course of the Rhine, by which they could communicate with the Spanish Netherlands and intimidate the Dutch; they were also masters of the important Valtelline, that long pass which led from the Milanese territory, at this time in their hands, to their German friends in Bavaria and Tyrol. Richelieu determined to attack them both in Germany and in the Italian Alps,—in Germany by supporting the leadership of Christian IV. of Denmark, though he would have much preferred that of Gustavus Adolphus; in the Alps by allying himself with Charles Emmanuel, duke of Savoy, with Venice, and with the Grison leagues. With hardly any resistance he swept the Spanish and papal troops out of the Valtelline; for Urban VIII. was only half-hearted on the side of Spain, and was to some extent influenced by the true winner of some of Richelieu's greatest triumphs, the crafty Capuchin, Father Joseph. Just, however, as all was going on well, Richelieu was paralyzed by an unlucky outburst of Huguenot independence; affairs in Germany took a bad turn, for Wallenstein now appears on the scene with a new imperial army; the attack of the duke of Savoy on Genoa failed; the French in Piedmont and the Valtelline felt themselves insecure. A temporary peace was made with the Huguenots, and in May, 1626, the treaty of Monzon with Spain closed Richelieu's first attempt to reduce the preponderance of that power. It is perhaps the darkest hour of his career; the treaty was secretly and treacherously agreed on; he left his allies to shift for themselves; he seemed to reverse his whole policy. The truth was that the strength of the Spanish party at home, the ill-success of the Lutherans in Germany, and the weakening effect of Huguenot insurrection made it impossible for him to persevere.

The treaty of Monzon.

Second period of his career.

2. It was clear that he must bridle the Rochelle Protestants before he could advance a step; so doing, he would also make a beginning in his second aim, that of bringing down the noblesse,—for some of the proudest aristocrats of France were Huguenots; then he could coerce the queen-mother and her party, with its Spanish leanings; and after that he would be free to resume his foreign policy. This second period of his public career, therefore, is chiefly occupied with the overthrow of the Huguenot power, which was concentrated at La Rochelle. It was, however, preceded by a great court intrigue, for he was already very obnoxious to the nobles near the throne, and to the princes of the blood. The plot was easily detected and crushed; Marshal Ornano perished in prison; Gaston of Orleans, the king's dissolute younger brother, was compelled to make abject submission; the duke of Vendôme lost his government of Brittany; the duchess of Chevreuse was banished; the queen herself was warned to behave more wisely in the future. The influence of women during this century is almost uniformly baleful; that of Henrietta Maria, sister of Louis XIII. and wife of Charles I., led to the attempt of Buckingham to recover his popularity in England by espousing the Huguenot cause, which was exciting a warm interest in the English people. The Huguenots, irritated by the establishment of Fort Louis as a check on La Rochelle, declared war on France herself; they were secretly encouraged by Anne of Austria and the court party, as well as by the Spaniards, who were delighted to see the cardinal thwarted and France weakened by civil war. They were also openly backed by England, which declared war on France, and sent a strong fleet under Buckingham to succor La Rochelle. But there was in light-headed handsome Buckingham nothing of the soldier; he failed ignominiously, while the cardinal's siege grew daily stricter and more certain of success. After fourteen perilous months of siege, Richelieu entered the town in triumph. With the fall of La Rochelle ends the stubborn resistance of the Huguenots to the monarchy; the siege was a kind of after-blow to the civil wars of the previous century. No very severe penalties were exacted from the town; it was simply rendered powerless. The fall of the place roused a warm patriotic feeling in France; it was regarded as a great defeat of England. Buckingham's assassination had opened the way to peace, which was signed between the courts of England and France in September, 1628.

1626-1631.

Third period of his career.

3. It was full time for Richelieu to interfere elsewhere. The utter collapse of the resistance against the house of Austria in Germany had come. Wallenstein was omnipotent in the north; Christian IV. had been driven back into Denmark; the king of Spain was in league with the duke of Rohan and the discontented Huguenots of Languedoc; affairs in Italy were very threatening; the Spaniards were pressing Casale, the key of the great valley of the Po; on the two sieges, La Rochelle and Casale, which took place at the same time, the fortunes of Europe turned. Richelieu, while he sent his agent Charnacé to North Germany to do what he could to check the Austrian advance and to raise up fresh barriers, set himself to relieve Casale. In January, 1629, he had carried Louis XIII. into Italy, and the Spaniards at once raised the siege of Casale. Thence he returned into Languedoc, where the Protestant rebels were moving; they too were speedily put down; and Richelieu, with Father Joseph, once more posed before Europe as the champion of Catholicism. Urban VIII., who little knew his man, wrote him a letter of warm thanks and congratulations. With the fall of Montauban, the last glimmer of local independence in France died out. Before the end of 1629 Richelieu was called on once more to interfere, and this time more seriously, in Italy; the pope, the duke of Mantua, the republic of Venice, all in alarm appealed to him to save them from Spanish domination. He prevailed on the king to appoint him lieutenant-general, and, with a splendid staff and army crossed the mountains into Italy early in 1630. His campaign, which did not include any open warfare against Spain, was thoroughly successful; he reduced all Savoy to submission, in spite of the duke's ill-will. While he was thus making a splendid and theatrical campaign in Italy, he was quietly engaged on far greater things elsewhere; he was busy organizing and encouraging the resistance of northern Europe to the house of Austria. Charnacé with Gustavus Adolphus, and Father Joseph at the Ratisbon Diet, were charged with this duty, and fulfilled it with eminent success. It was in 1630 that Gustavus accepted the friendship and help of France, and early in 1631 signed at Bärenwald a treaty of alliance with that power, which consented to pay him a great subsidy for five years. This treaty, in which Gustavus promised not to coerce peaceful Catholics, was approved even by Urban VIII. At the Ratisbon Diet in June, 1630, Father Joseph had a more delicate task; yet he too succeeded. The jealousies of the German princes neutralized all the advantages of the emperor Ferdinand, and brought about the fall of Wallenstein, who withdrew in haughty disdain to Bohemia; the princes also protested against the attempts of Ferdinand on Italy; and he, wishing above all things to conciliate them, and to get his son Ferdinand named Rex Romanorum, promised to secure the Gonzaga-Nevers duke at Mantua, and to withdraw his troops from the second siege of Casale. The first treaty of Cherasco (April, 1631) brought the Italian war to an end; a second treaty, made by Richelieu with Victor Amadeus, the new duke of Savoy, secured for France Pinerolo, the key of the approaches to Turin. Giulio Mazarini, the pope's agent, made his first public appearance in the negotiations of this Italian war, and laid the foundations of his fortunes in France.

Gustavus Adolphus enters in.

The Day of Dupes.

A little before this time Richelieu had passed through the most critical moment of his career; the queen-mother, the reigning queen, Gaston of Orleans, still heir to the throne, the house of Guise, a group

1632-1638.

of generals and officers of the crown, the duke of Bouillon, the count of Soissons, all the favorites and courtiers of Louis XIII., had conspired together to overthrow the cardinal. In the very moment of their apparent success, when the king, as they thought, had entirely given him up, the skilful audacity of Richelieu reversed all their plans. He threw himself on Louis XIII. for support, and the king, glad to be delivered from their hands, gave the cardinal *carte blanche;* the "great storm of the court," the "Day of Dupes," passed by and left him stronger than before. He showed no hesitation in punishing and crippling his foes. The queen-mother was got rid of; she took refuge at Brussels, and her ladies were exiled; Gaston fled to Lorraine, the duke of Guise to Italy; the parliament of Paris, which had favored the plot, was reduced to humble submission. Richelieu was now made duke and peer, with the government of Brittany. The attempts of the emigrant nobles to raise the provinces on the borders were sternly and swiftly put down; the battle of Castelnaudary in Languedoc closed the series of outbreaks. The duke of Montmorency, son of the constable, was taken there, and afterwards executed. After pacifying Languedoc, Richelieu rearranged the governorships of the provinces, removing hostile or suspected governors, and putting his own friends in their places. By the end of 1632 he had crushed all the serious elements of resistance throughout France.

This period coincides with the splendid career and premature death of Gustavus Adolphus. His rapid advance and high aims had alarmed Richelieu; his fall at Lützen was a distinct relief to his ally; it enabled him to step in between the combatants with emphasis, and to shape the latter years of the Thirty Years' War so that they might conduce to the advantage of France. In July, 1632, he had seized the duchy of Lorraine, almost without striking a blow, the duke having taken part with the emigrants against him. He was now prepared to advance thence to the Rhine; he took the Protestant adventurers, Bernard of Saxe-Weimar and others, into his pay. Things worked well for Richelieu: the murder of Wallenstein in 1634, the abandonment of the prince's party by the elector of Saxony (peace of Prague, 1635), the lack of a head for the German Calvinists,—all these things combined to open the way for the last and most brilliant period of Richelieu's career.

Fourth period of his career.

4. Late in 1634 he had renewed his alliances with Sweden and the German Calvinists; he persuaded the Dutch to attack the Spanish Netherlands in May, 1635; he declared war on Spain, and came openly into the field, in which hitherto he had worked only by secret and oblique methods. He had under his command such a force as France had never seen: 132,000 men in four armies seemed likely soon to bring the weary war to an end. One army was to join the Dutch under Frederick Henry of Orange and to march on Brussels, a second to unite with Bernard of Weimar and the Swedes across the Rhine, a third to hold the line of the Vosges and protect Lorraine; the fourth with the duke of Savoy should reduce the Milanese country. The result, however, in no way answered the expectations; the campaigns of 1635 and 1636 were unsuccessful and burdensome; neither glory nor profit followed; the Spaniards and Austrians invaded France on three sides,—in Picardy, across the Pyrenees, and in Burgundy. Nor was 1637 more decisive. Though the invaders had been swept out, no important actions took place, no great results followed. The successes of Bernard of Saxe-Weimar on the Rhine in 1638 first showed that the Austro-Spanish power was checked. In this year the first steps were made towards the peace of Westphalia. The birth of the dauphin Louis also now ruined the court party, and secured to Richelieu a firmer lease of power; if their sickly king were to die, as seemed only too likely, he would continue to guide the fortunes of the state under a regency; the hopes and future of Gaston of Orleans were reduced to nothing. The fall of Breisach at the end of the year, which placed the upper Rhine completely in the hands of Bernard of Saxe-Weimar, though it might not be altogether grateful to Richelieu, who feared the skill and abilities of the ambitious and patriotic German, proved to the world that the Austrian power was worn out. The death of Father Joseph at the same moment caused the cardinal no small embarrassment; his place was taken by the supple Mazarin. The death of Bernard, just as his plans seemed on the point of being realized—just as he thought he had made for himself a principality on the Rhine to check the progress as much of France as of Austria—came very opportunely for Richelieu. There was now no one engaged in the war who could interfere with his objects; he got possession of the army which had served Bernard so well, the best body of fighting men the war had produced after the Swedes had been exhausted; he also seized on the districts in their hands. In 1641 the count of Soissons went over to the Spaniards and invaded northern France. He fell in battle, and the attempt failed. In Germany and Italy the strength of France was more and more distinctly shown. The last battles of the Thirty Years' War were chiefly won by Frenchmen; the cession of Sedan by the duke of Bouillon. and the capture of Perpignan close to the Spanish border, were "the last present made by Richelieu to France" (Michelet). The one helped to secure her northern, the other her southern frontier. The cardinal's last struggle for supremacy took place now. In 1641 the parliament of Paris was humbled, and its ambition to rival the English parliament rudely destroyed; in 1642 the conspiracy of Cinq Mars gave expression to the old and undying hatred of the court for Richelieu. The plot was detected and unravelled as soon as it was spun, and Cinq Mars with his friend De Thou perished on the scaffold at Lyons. After this, all were prostrate and obedient; the court party was utterly foiled, its chief members dead or exiled; the cardinal's foreign policy was triumphant, and neither Spain nor Austria could do more. But he had no time to enjoy the successes his cold heart and strong hand had won; he fell into the hands of the one enemy whom no subtlety could baffle, and died in December, 1642. Richelieu had an inflexible will, vigorous abilities, and a clear idea of what he desired that France should be; and it is hardly too much to say that he made France what she has continued to be almost to our days. Not till the centre of power in Germany had passed from Austria to Prussia did the old foreign policy of France fail; not till constitutional life had got firm hold on the French people did the republic succeed in reversing the evil principles and consequences of Richelieu's home government. His leading idea was that unity brings strength; and into unity his stern resolves and pitiless severities forced his reluctant country. In the career of Louis XIV. we read the true commentary on his acts and principles; in the corrupt and deadly despotism of the 18th century we read its punishment; even the Revolution, though it scourged the older system with scorpions, could not at once destroy it, or build on surer foundations. When we remember how Richelieu crushed, one after another, those elements of society, which had in them germs of a modern constitutional life, we are tempted to speculate on the splendid career which was possible for France had a wiser statesman ruled her in these critical years. The base subserviency of the church, the humiliation of the lawyers in the parliaments, the loss of noble independence, the overthrow of all healthy civic life, the steady depression of Huguenot opinions. the silence of the States-General, the diminution of local liberties even in the "pays d'états," the assertion of the king's independent right to levy taxes and issue edicts,—all these evils might have been avoided, and the strong life, strong often to turbulence, which lived in these different institutions might have been harmonized, brought into friendly and fruitful action, until an original and characteristic constitutional history had given France that strength and prosperity, that home development of magnificent resources, which would have secured her the undisputed lead and lordship among the nations of Europe. Instead, Richelieu gave her unity and glory. The burdens of France increased enormously; her aggressive power, now that she was concentrated in the hand of a despot, who had unchecked command of the persons and purses of his subjects was immensely increased. If we look into Richelieu's character, we shall discern, side by side with that pride which could rejoice in debasing the noblest and strongest, a vanity which, like a vein of impurer metal, spoilt the ring and clearness of his life. He was always conscious of effects: as an author, a dramatist, or a statesman, he was on the look-out for "situations;" his most striking political successes seemed due as much to the necessity of impressing men by startling novelties as to an honest belief in the justice of his cause or the wholesomeness of his course of action. His extraordinary powers, his life-long devotion to the policy he had drawn out for himself and France, secure him his safe posi-

1641-1642.

Character of Richelieu.

1642.

tion as a great man,—a great man on the lower level,—one whom one fears, perhaps admires, but never loves; because there were in him no really high aims, nor any true love of the people under him, nor any desire to rule them well. Richelieu has been often compared with Wolsey and contrasted with Mazarin. The red robe of the cardinal is common to all three; beyond this the comparison with Wolsey is of little value, for the men were essentially unlike in character and aim. The contrast with Mazarin, who lived with him, studied his policy, and succeeded him, is of more value and interest. It is brilliantly treated by Voltaire in his *Henriade* (vii. 327 *sq.*):—

> "Henri, dans ce moment, voit sur des fleurs-de-lis
> Deux mortels orgueilleux auprès du trône assis.
> Ils tiennent sous leurs pieds tout un peuple à la chaîne;
> Tous deux sont revêtus de la pourpre romaine;
> Tous deux sont entourés de gardes, de soldats;
> Il les prend pour des rois. . . . Vous ne vous trompez pas;
> Ils le sont, dit Louis, sans en avoir le titre;
> Du prince et de l'état l'un et l'autre est l'arbitre.
> Richelieu, Mazarin, ministres immortels,
> Jusqu'au trône élevés de l'ombre des autels,
> Enfants de la fortune et de la politique,
> Marcheront à grands pas au pouvoir despotique.
> Richelieu, grand, sublime, implacable ennemi:
> Mazarin, souple, adroit, et dangereux ami;
> L'un fuyant avec art, et cédant à l'orage,
> L'autre aux flots irrités opposant son courage;
> Des princes de mon sang ennemis déclarés;
> Tous deux haïs du peuple, et tous deux admirés;
> Enfin, par leurs efforts, ou par leur industrie,
> Utiles à leurs rois, cruels à la patrie."

One thing they had in common, the love and encouragement of letters; yet even this in Richelieu's hands must be organized, despotic. Still, he and Mazarin have an honorable claim to remembrance when we speak of the writers of the "great age," for it was under them in the first half or so of the century, rather than under Louis XIV. in the latter half, that the chief masterpieces were produced. The tendency of the reign of Louis XIV. was rather to depress than to ennoble literature. Richelieu founded the French Academy in 1635, and set on foot the *Gazette of France;* he established the royal printing press; he desired to patronize learned men, though his own literary efforts failed, and men of real independence of character, like Corneille and Descartes, shunned the fatal honors of his patronage. He was in all his tastes a great and showy prince; his bearing and surroundings were more than noble; he called to his side artists of every kind; art, in its 17th century decadence and formalism, was well content to do his bidding, and gild an age of splendor without genius.

The rise of Mazarin.

Louis XIII. died within six months after Richelieu's death; he did but give time to Mazarin to win the favor of the queen and to secure his position as first minister. Mazarin was destined to fail completely in home government, while in foreign affairs he brought all his great master's policy to a splendid and successful end. At home his rule reversed Richelieu's stern principle of repression. The subtle and flexible Italian, after the manner of his countrymen, hoped to succeed by counterpoises, by playing factions off against one another, by trading on the meaner side of human nature, by love affairs and jealousies, and all the stock in trade of weak intriguing characters. His rule is characterized by the burlesque wars of the Fronde, which sufficiently showed his want of firmness and the degradation of the age.

Louis XIV.

Louis XIII. left at his death two sons, Louis the dauphin, now Louis XIV., and Philip duke of Anjou, afterwards duke of Orleans, who founded the Orleans branch of the Bourbon family, which ceased to reign on the deposition of Louis Philippe in 1848. The regency was in the hands of Anne of Austria, his queen; Gaston of Orleans was named lieutenant-general of the kingdom; the direction of the government was placed with a council, the prince of Condé, Mazarin, Seguier the chancellor, and two more. The king's will, however, was little respected. Anne, a haughty and ambitious woman, with Mazarin to back her, was not likely to care much for the clog of a council of regency.

Regency of Anne of Austria.

The parliament of Paris, flattered at appearing to be the arbiter of the counsels of kings, set aside the will, and declared Anne independent regent. The old court party, of which Anne had always been the head, expected to rule at will; Mazarin was tolerated only because he was necessary to bring foreign affairs to a successful issue; that done he would have to go.

1642-1648.

The "Importants."

The "Importants," as they were nicknamed, a frivolous and unworthy company of noble nobodies, reckoned on a long lease of power; the king was little more than a babe,—he was but four years and a half old,—and it would be strange if they could not secure themselves. The war on the frontiers, however, ruthlessly destroyed their hopes. The Spaniards, cheered by the deaths of Richelieu and Louis XIII., had besieged the little frontier-town of Rocroi; Mazarin hastily sent up an army to relieve the place, commanded by Marshal L'Hôpital and the young duke of Enghien, eldest son of Henry I., prince of Condé, a distant cousin of the king. In spite of L'Hôpital's prudent counsels, Enghien recklessly with the confidence of genius and youthful inexperience attacked and utterly defeated the world-famous Spanish infantry, and killed their aged general Fuentes. The battle of Rocroi (1643) destroyed for ever the older fighting-power of the world, the solid Spanish foot, and gave to France her first taste of that military glory which marks the reign; it was the *baptême de feu* of the child-king of France; it also secured the dominance of Mazarin. The house of Condé was his friend; Rocroi enabled him to hold up his head against both Spain and the "Importants;" their party, for the time, was utterly broken up.

Condé and Turenne.

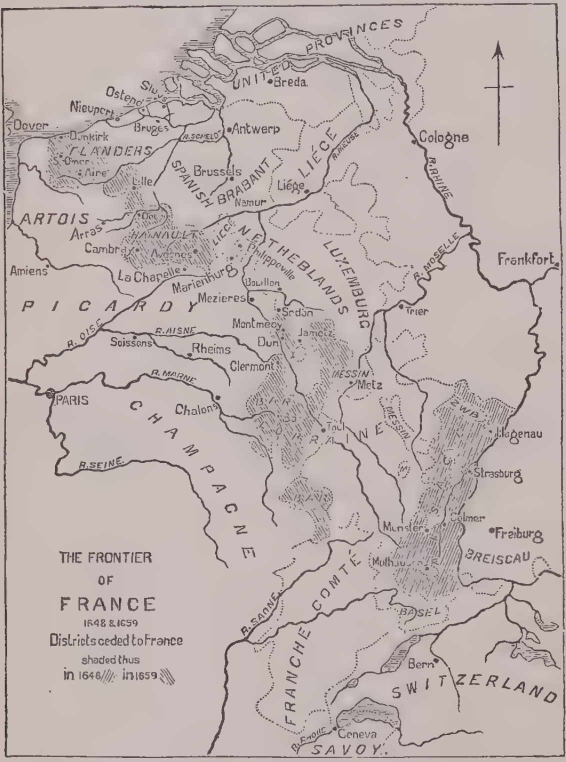
In these closing years of the Thirty Years' War two able soldiers came to the front, the Great Condé and Turenne,—the one all fire and dash, alike dangerous to friend and foe, the other the greatest tactician of the age. The one represents at its best the old noble fighter, the other the modern skilful officer. In 1644 they drove the imperial general Mercy out of his position at Freiberg, and became masters of the middle Rhine-land; in 1645, pressing the Austrians nearer home, they fought and won the sanguinary second battle of Nördlingen; so much were they weakened by that Cadmean victory that they were unable to keep the advantage, and were thrust back to the Rhine. In 1646 they directed their attention against the elector of Bavaria, in hopes of being able to detach him from Austria; Turenne took undisputed possession of the whole upper Danube valley, and threatened the elector Maximilian at Munich. In 1647 he, to free himself from the invader, who mercilessly ravaged and plundered his lands, signed a separate truce with France, and abandoned at last the imperial cause. Well might the house of Austria now feel that by any sacrifices it must bring the long war to an end. When the elector broke truce early next year, his resistance was crushed by the French at Zusmarshausen, and the fighting in Germany was over. The war had rather more life in it as between France and Spain. In Italy, Flanders, and Catalonia considerable movements went on; that in Flanders, where Condé commanded, was alone decisive; the battle of Lens (9th August, 1648), the last of the fighting on that side, was a crushing and final defeat of the Spanish, and even more fatal to their power than the overthrow of Rocroi.

The peace of Westphalia.

For years there had been negotiations for peace; they had taken definite form as long back as 1639 at Cologne. In 1643 the congresses of Münster and Osnabrück were set permanently going: at Münster, France, Spain, and the Catholic princes were to make terms with the emperor; at Osnabrück negotiations should go on between him and Sweden, and the Protestant princes; the results should be welded into one coherent treaty of peace. The Dutch and Spaniards made peace together in January, 1648, so ending their eighty years' struggle. The terms between the empire and Sweden were signed at Osnabrück in August; those between the empire and France at Münster in October, 1648. The quarrel between France and Spain alone remained unsettled. The peace of Westphalia, as was necessary, largely favored France. As the war had gone on, her growing strength, and at last her preponderance, had made this quite inevitable; yet in actual gain of territory France received but little, only Austrian Alsace being added to the kingdom. In influence and in relative strength, however, she grew much. The power of Germany was broken up; the princes friendly to France, the elector of Treves, the Palatine house, the house of Hesse Cassel, the Swiss cantons, were all strengthened. The three bishoprics, Metz, Verdun, Toul, were ceded in full sovereignty to France, as was also Pinerolo; she might garrison Philipsburg; the chief Rhine fortresses, barriers against her ambition, were to be dismantled; Breisach remained in her

1648.

hands. Austria was cut off from the Netherlands, and was rendered almost powerless. Thus the foreign policy of France was finally triumphant, although Richelieu did not live to see it. He had marked out its course, had watched over the preparations for it, had set it in motion, and had seen it through its earlier failures and difficulties; then he bequeathed it to Mazarin, who, though far inferior to him in tenacity and unity of purpose, was perhaps better fitted to steer things to their end; for his subtle skill and flexibility were exactly calculated for the intricate mazes of long negotiations, and could well defend French purposes amidst the innumerable and conflicting claims and wishes of the states represented at the congresses.



THE FRONTIER OF FRANCE 1648 & 1659
Districts ceded to France shaded thus in 1648 ▨ in 1659 ▨

Charts of Districts ceded to France in 1648 and 1659.[1]

Mazarin and home-affairs.

No sooner had the peace of Westphalia settled, as it did for long years, the basis of the public law of Europe, than Mazarin was obliged to turn his attention to home-affairs, in which he was never so fortunate as in his foreign ventures. It has been noticed that a singular movement, adverse to the claims of monarchy, was at this very moment sweeping across Europe. The rulers of every state seem to lose power, sometimes are overthrown entirely. The characteristics of the Thirty Years' War tended to produce this result,—partly by depressing Austria and Spain, partly by familiarizing men with the careers of brave adventurers not royal, not even princely, partly by arousing enthusiasm for strong Protestantism, as in the English volunteers who supported the Calvinist "winter king," or took service under the "Protestant hero," Gustavus Adolphus, partly also by the results of the war, as seen in the acknowledged independence of the United Provinces and Switzerland, two republics finally freed from royal control. Besides this there was an aristocratic reaction which had brought down the monarchy of the papacy, as was clearly seen in the long pontificate of Urban VIII.; there was the popular reaction which was steadily destroying the absolutist theories of the Stewarts in England; there was a certain weakening of royalty in Scandinavia, whether at Stockholm or at Copenhagen. And France could not fail to feel the same influences at work. Mazarin's easier rule allowed the princes and nobles whom Richelieu had steadily kept down to raise their heads again, and the lawyers who composed the parliament of Paris, flattered at having been allowed to pronounce an authoritative judgment on the last will of Louis XIII., and thinking themselves an institution parallel to the parliament of England, were also much disposed to take advantage of the childhood of the king, the weakness of the queen-mother, the easier disposition of the cardinal. The French people, who had much rejoiced when Richelieu died, thinking that his heavy burdens would be lightened, were deeply irritated to find that they had fallen into the hands of a greedy foreigner; that their financial position was worse and their burdens grew yearly heavier; that Mazarin allowed Emeri, a harsh and cruel creature, also an Italian, to manage the purse of France, and to plunder it at will for his own and his master's profit. These causes are quite enough to account for the outbreak of civil war in 1648. The only wonder is that this war, "War of the Fronde," or the Sling (a nickname drawn from the boys in the city ditches of Paris, who played at mimic fights with slings), proved so hollow and absurd when one sees engaged in it the great names of Condé and Turenne. The name of the Fronde was first adopted by the leader of the movement, the coadjutor to the archbishop of Paris, Paul of Gondi, who is best known to history as the Cardinal de Retz. The immediate cause of the outbreak was the attempt of Mazarin to punish the parliament of Paris for having brought about the dismissal of his corrupt agent Emeri. The news of Condé's great victory at Lens (9th August, 1648) had inspirited the court party, which counted Condé as its champion; and Mazarin determined to use the enthusiasm thus aroused to strike terror into the parliament. On the thanksgiving day for the victory, four members of the parliament were suddenly arrested, one of them being Broussel, "an old counsellor in his dotage, whom the mob loved for his rude manners and his fine head of white hair." All Paris was at once in an uproar; the coadjutor De Retz threw himself into the disturbance, obtained Broussel's release, and quiet for the moment was restored. The queen-mother and Mazarin, alarmed at the troubled look of affairs, fled from Paris to Ruel. The parliament took the lead in what seemed to be a revolution, and De Retz, a born agitator and demagogue, gave to the lawyers a popular force in the discontent of the Paris mob. Though the court had been induced to return to Paris in October, 1648, Mazarin thought it safer to escape with it again early in 1649 to St. Germains. Then the discontented nobles, chiefly influenced by that romantic intriguer, the duchess of Longueville, Condé's sister, united their cause with that of Paris and the parliament, and seemed likely to overbear all opposition. The prince of Conti, Condé's younger brother, the duke of Longueville, a crowd of others, and eventually Turenne himself, formed the heads of a new "War of the Public Weal." Condê saved the court; his siege of Paris, and the weariness of the people, who had to pay for all the brilliant follies of their noble allies, led to the peace of Ruel early in 1649,—a delusive peace, negotiated by the stiff pedantic president of the parliament, Matthew Molé. This movement marks the division between the Old Fronde and the New,—the Old the Fronde of Paris and the parliaments, the New the Fronde of the discontented nobles. These latter were by no means inclined to accept the agreement of Ruel; the second period of the Fronde began at once; Condé tried to play a middle part, intriguing with both sides, and equally disliked by both. He formed a kind of party of his own, that of the "petits maîtres," the frivolous young nobles, dazzled by his bright manners and warlike reputation. The chiefs of the New Fronde began serious negotiations with Spain, and Spanish troops entered northern France, descending as far as to Rheims. Anne of Austria, somewhat strengthened by the adherence of the Old Fronde, ventured now to arrest Condé, Conti, and Longueville, early in 1650. But the duchess of Longueville escaped, whereby the stroke was rendered a

1648-1650

The war of the Fronde.

The Old and the New Fronde.

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[1] Copied (reduced) by permissionof the Delegates of the Clarendon Press, Oxford.

complete failure. She carried Turenne over to the New Fronde, and he, supported by Spanish troops, threatened Paris. The three prisoners were sent down to Havre for safety; Turenne's Spaniards were driven back to the frontier, and the royal troops retook Rethel from them. Feeling that Paris was still too uneasy for him, Mazarin released the three prisoners, and withdrew to Brühl on the Rhine. His cunning thought was that Condé would certainly arouse jealousies and confusion, out of which the royal power might soon recover authority. Nor was he wrong: in the autumn of 1651 the Old Fronde had come entirely over to the court; De Retz, satisfied by the exile of Mazarin, was bought with a cardinal's hat; Condé withdrew, and roused revolt in Guyenne, where he was strong. He reckoned on the help of Turenne and the Spaniards in the north; but all calculations were certain to be vain in a war in which love and vanity, jealousies and mean ambitions, ruled supreme. Turenne at once went over to the court, and took command of the king's troops; Mazarin came back, the king's majority was declared. A struggle for Paris followed, in which Turenne showed himself the master of his great rival, first checking him at Étampes, and then defeating him completely in the suburbs of the capital (1652). Condé with the remnant of his force took refuge in the town through the St. Antoine gate. Next year, all being weary of the war, the young king was invited back to Paris; Condé withdrew into Champagne and joined the Spaniards, with whom he remained till the peace of the Pyrenees. The New Fronde was entirely broken up; the Old Fronde had long been weary of the whole affair; Cardinal de Retz was a prisoner at Vincennes, and his career was over. Ere long Mazarin, who had again withdrawn from court to Sedan, was recalled; the parliament of Paris, which in 1654 demurred to the heavy cost of the Spanish war, was ordered by the king to abase itself; its meetings were forbidden; for nearly a centry and a half its political action was suspended.

War with Spain.

Cromwell and Mazarin.

The peace of the Pyrenees.

Mazarin's end and character.

All this "burlesque war," this "war of children, with a child's nickname," "comic in its origin, its events, its principle," as Michelet says of it, had been like the light scene which the skilful dramatist interposes between the great movements of his tragedy, at once to relieve the strained attention of the hearers and to heighten the effect of the catastrophe. It fills with light and merry motion the period between Richelieu and Louis XIV.; it was "the game of lively schoolboys in the interval between the lessons of those two stern and severe teachers." The Spaniards were still at war with France; and nothing so clearly shows their utter exhaustion as their inability to take any serious advantage of the troubles of their adversaries. The civil wars over, France soon drove Spain to the wall. Condé, in command of Spanish troops could achieve nothing; in 1654 the Spaniards failed at the siege of Arras, and the French took Stenay; Louis XIV., who was with the army, perhaps here imbibed that love of sieges which always marked his military career. In 1655–1656 the fortunes of the war were almost evenly balanced, the Spaniards having perhaps the best of it in the north; and troubles with the noblesse began again, while the new opinions and party of Jansenius of Utrecht, which had been condemned by Pope Innocent X. in 1653, found great favor among the French clergy, who disliked the doctrines and tendencies of the Jesuits. From this time to the end of the reign of Louis XIV. the Jansenists of Paris are in more or less open opposition to the court; in these days they sympathized much with De Retz. Now, however, Mazarin's skill as a foreign minister enabled him to triumph over all opposition. The strong government of Cromwell had in 1654 secured the tranquil progress of England by treaties with the chief northern powers and with Portugal; now in 1655 he had to choose between alliance with France or with Spain. Nor could he hesitate. Spain still spoke her ancient tongue—the tongue of intolerance and Catholic repression; France in Mazarin's hand had been willing to tolerate the Huguenots, and to aid the Protestant party in Germany. A treaty between England and France was accordingly signed in October, 1655, a treaty of peace and commerce; a little later it was followed (March, 1657) by an offensive and defensive alliance. Six thousand English Puritans, led by Turenne, made an immediate change in the character of the war, and the Spaniards began at once to give way. In 1658 Turenne caught them at the Dunes, not far from Dunkirk, and defeated them completely; Dunkirk yielded, and was duly handed over to the keeping of the English; the Spaniards were swept away, Gravelines, Furnes, Oudenarde, all fell; Brussels was threatened. In August of this year Lionne, Mazarin's agent, on occasion of an election to the Holy Roman Empire, concluded an agreement with the princes on the Rhine for the upholding of the peace of Westphalia; and France could show herself as the ally at once of England, Sweden, Bavaria, the ecclesiastical electors, the house of Brunswick. At last in 1659 Spain yielded, being utterly unequal to the strife. The peace of the Pyrenees gave to France Gravelines, Landrécy, Thionville, and Montmédy, and Spain also ceded all she held in Artois; though the duke of Lorraine was replaced at Nancy, the Duchy of Bar, and some smaller places along the Champagne border, were ceded to France. In Germany itself Louis XIV. secured Juliers to the duke of Neuburg, and the original trouble which led to the Thirty Years' War was finally settled eleven years after that war had ended. All French conquests in Catalonia were restored to Spain, while France became finally master of Roussillon and Conflans; Condé was pardoned and taken into favor. Finally, the treaty involved a great marriage compact between Louis XIV. and the infanta Maria Theresa of Spain. The actual marriage, which took place next year, was garnished with a dowry never paid, and with a renunciation by the infanta of all her rights to the Spanish crown or Spanish possessions, which was thrust contemptuously aside when in 1667 Louis XIV. desired to get hold of the Spanish Netherlands, or when forty years later he placed the crown of Spain on the brows of his young grandson Philip. The peace of the Pyrenees and this Spanish marriage firmly established Louis XIV. on his throne as the most powerful monarch of Christendom; it was time for Mazarin to withdraw and leave his pupil in full command of the realm. He spent the last year of his life in teaching the young monarch those lessons of king-craft on which he built up his career,—taught him to avoid a first minister, instilled into him a belief that ill-faith in treaties was good policy, and urged him to cultivate his "natural gift of dissimulation;" called his attention to the miserable state of finance, and commended to him his trusted agent Colbert, as the man best fitted to bring order out of confusion; finally he placed his own huge fortune, some ten millions sterling of our present reckoning, wrung from the misery of France, at the king's disposal. Louis, however, replaced it honorably in the cardinal's hands, who left the bulk of it to his nieces, and with part founded his "College of the Four Nations" for the education of noble children from the districts added to France in 1648 and 1659. To this college he bequeathed that splendid library which he had based on Richelieu's fine collection, and had admirably enlarged by the care and skill of his librarian Naudé. He had done what he could for arts, literature, and science, had established the academy of painting and sculpture, had pensioned Descartes in Holland, and had introduced at Paris the Italian opera. In all the solid elements of good government he was entirely wanting; and it remained for Colbert to struggle against his fate,—the fate of serving a grand monarch, who would neutralize his endeavors to secure financial and commercial prosperity for France. Mazarin died in March, 1661, leaving the state in the unfettered hands of Louis XIV., who, though now twenty-two years old, and a king for 18 years past, had as yet been little but a cipher on the throne.

Character of Louis XIV.

Nothing is more striking in all history than the contrast between the Louis whom men saw under Mazarin's tutelage, and the Louis whom France long adored as her Great Monarch. In the earlier period there was the dull and tranquil docility of a great creature which as yet knows not its amazing strength, and has as yet none of the ambitions of power, and has never tasted blood. His nature, developing itself very slowly and late, seemed to onlookers to be only heavy and commonplace; courtiers noted with keen eyes that the young prince liked amusements, and they promised themselves a bright and joyous reign, in which they would have free leave to spend as they liked the hardly-won wealth of France; it seemed to them perfectly natural that they should waste at will what they had never earned, and they fully believed that the young king would be their accomplice.

1661. His capacity seemed to be small; he was timid and ignorant. Mazarin almost alone was not mistaken in him, and no one knew him so well; "he will set off late but will go further than all the rest," was his judgment, and a just one, on the young monarch's character. For he was serious, severe, obstinate; he learnt little, and that slowly; but what he did learn he never forgot. He would neither bend nor forgive; and when he had once taken on himself the heavy burden of his kingly duties he never flinched nor repined for more than half a century. From the beginning he declared that he would rule without a first minister,—this Mazarin had instilled into him as a fundamental law of his kingcraft; and he kept his word, although it became clear in time that it was quite possible to hold him in close leading strings, so long as he himself did not find it out. At first, however, he was determined to have only agents around him,—men of business who should never expect to become too prominent,—not great lords of church or state, but men of middle or humble origin. With them he was prepared to undertake any amount of dry detail work of public business. Without a sigh he dedicated henceforth four or five hours a day, or even more, to public affairs; his commonplace abilities, his instinct of orderliness, his love of minutiæ, his punctual routine, which would have disgusted a livelier prince, formed the happiness of his life. "His ministers," says Michelet, "might change or die; he, always the same, went through his duties, ceremonies, royal fêtes, and the like, with the regularity of the sun, which he had chosen as his emblem." With a morbid conscience, he easily became subject to his confessor; with a limited intelligence and great lack of knowledge, he was dependent on his ministers without knowing it; with a vein of small vanity in his character, he was not above being led by the flatteries of the woman he loved. Finally, Louis XIV., though heavy-looking, was handsome and majestic in person; no one has ever played the part of a king with such equable gravity and success; his dignity was as striking as his selfishness; for his heart was dull, and neither surprises nor warm feelings could throw him off his balance. His whole reign passed without his ever showing any real feeling for his poor subjects; and his indifference to the health and feelings of those nearest him, his treatment of his court, especially of the ladies of it, was such as nothing but their abject fear of him, and the meanness engendered by the atmosphere of such a court, could explain.

The machinery of his government.

Louis XIV. began his true reign in 1661 by dividing the business of government into three agencies. He placed all foreign affairs under Lionne, who had served him so well in the war against Spain; Le Tellier had charge of the army and was war-secretary, supported by his strong-handed son, the terrible Louvois; and finance was entrusted to Fouquet, the most brilliant and unsatisfactory of his ministers. All three were men of middle origin; Lionne came of a family of gentle birth in Dauphiny; Le Tellier's father was a lawyer; and Fouquet was a citizen who pretended (as many Frenchmen have since done) to be of noble birth. The king had at his side also Mazarin's most trusted dependant Colbert, grandson of a wool-seller of Rheims. It was thought at court, where Louis was no better understood than elsewhere, that Fouquet would before long carry all before him, and fill the coveted post of first minister of the crown. The queen-mother, seeing that the king did nothing for his governor Villeroy, and that he was stepping resolutely forward in the path he had chosen, complained bitterly of her son's ingratitude, and declared with a sneer that he "wanted to pretend to be a man of ability." Fouquet, ambitious and bright, a favorite with the queen-mother, the court ladies, the literary world, the Jansenists, a man who let the finances fall into hopeless confusion and stooped to dishonest representations to save his credit, was not the man to suit the young king, and in a few months' time he had fallen for ever from power, and Colbert sat in his place.

Colbert.

John Baptiste Colbert, who was minister of Louis XIV. for two and twenty years, claimed descent from a Scottish family settled in France, and his character, his common-sense, rigid principles, business ways and tastes, and his simple habits, were just what one might have expected from such an origin; "a mind somewhat heavy and harsh, but solid, active, unwearied in work." He was first named comptroller-general of finance; he had also the supreme care of all home-affairs, and when the navy (after 1669) was first in his own and then in his son's hands, he may be said to have had charge of that also. 1661-1667 Till Louvois succeeded to the ministry of war in 1666, Colbert's influence on all parts of the administration was paramount: and the young king, partly understanding what he was doing, and wholly desirous of doing his best, gladly seconded him in everything. At first Colbert found everything in the financial department in a melancholy state: more than half the sum gathered in taxes disappeared before it reached the treasury, and the expenditure had so far grown as to leave a yearly deficit of nearly twenty-two millions of livres. To reorganize the finances was his first task; and by stern dealing with intermediate officials, by fixing the interest of loans at a maximum of five per cent., by sweeping away masses of useless officers, he succeeded in so far reducing the cost of levying the taxes and the burdens of the state that in six years' time the position of affairs was reversed, and the treasury had a good balance in hand, while the burdens imposed on the people were lightened The years which preceded the Devolution war of 1667 are perhaps the most prosperous that France had ever seen.

France under Colbert.

She made extraordinary progress in all directions. Even in foreign affairs her power was shown: she humbled the papacy, she asserted her precedence over Spain in the streets of London, she helped the emperor Leopold to resist the Turks and enabled Montecuculi to win a decisive victory over them at St. Gothard in Hungary, her fleets in the Mediterranean cleared away the African pirates. At home the triumphs of peace were far more splendid even than these warlike signs of power. Colbert's activity was unflagging; to reorganize the finances might have seemed enough to another minister; he regarded it as only the groundwork of his structure; on it he would raise a new and brilliant France, splendid among the nations, not only feared—that was something—but admired as well, and humbly imitated. So he set himself in these years to develop his country on every side. For agriculture indeed he would do but little, for his temper was the opposite of that of Sully. Sully, a great lord, and owner of broad estates, rated manufactures as of little value by the side of tillage; Colbert, a townsman, and of the middle classes, thought that the encouragement of agriculture signified the increase of noble wealth and privilege, while manufactures would tend to build up a rich and useful burgher class, obedient to the king and fruitful in taxpaying. He therefore devoted his attention to manufactures and commerce, and to the communications by land and water necessary for them. He made good roads, set on foot the canal of Languedoc, declared Marseilles and Dunkirk free ports.

Manufactures.

He then re-established old manufactures and introduced new ones, such as tapestries, silk, mosaics, cabinet-making, lace, cloth of gold, pottery, steel-work, and the like, a long series of "royal manufactures," the industries of taste and luxury, which can flourish only on the favor of the great. Colbert's system was therefore one of protection and bounties, and never enabled France to discover for what forms of labor she was by nature specially suited. The true wealth of France lies in her soil,—in her varied agriculture and the thrifty habits of her people; yet the world has ever believed that these "Louis Quatorze" ornaments, these works of art and of little use, are the special glory of French workmanship, the models of good taste. This royal direction thus given to French industry, though it only slowly (if at all) increased the true wealth of the nation, added largely to its credit, and heightened its splendor in the eyes of the world.

Commerce.

On industrial movement commerce must naturally wait; and Colbert attempted much for the circulation of productions. He set on foot four great companies, though they never really prospered. Patronage and direction, which could establish and freshen manufactures, failed here. In the end Frenchmen, with little gifts for colonization, and no decided bias for the sea, learnt chiefly to produce for their own consumption.

The arts.

In these years, the same royal and official patronage was largely extended to letters and science as well as to the arts. The last was no doubt regarded as directly connected with the general progress of the favorite industries mentioned above; in building a great palace at ruinous cost, Louis XIV. and Colbert both thought that French industry was being encouraged, and money circulated. Versailles was under-

1667.

taken in 1661 (it had previously been a royal hunting-box built by Louis XIII.); the famous colonnade of the Louvre, Perrault's work, was begun in 1665; Bernini was summoned from Rome that same year to assist in the great works. The buildings erected in this period have all the same deadness of style; they are splendid, no doubt, and crowded with ornaments; we note in all a want of spontaneous fire; no longer does genius create; talent, at the service of a master, can only copy or conceal its poverty under the cloak of rich ornamentation. The paving and lighting of Paris was a more beneficial work; the quays, squares, and triumphal gates of the period did much to make up for the abandonment of the capital by its kings,—for after the days of Henry IV. the Bourbons spent very little time in Paris.

Learning.

Colbert also established at Paris those new learned or scientific academies which were intended, after the pattern of the new Royal Society of London, to stimulate and direct the progress of knowledge. Such were the Academy of Inscriptions, founded in 1663; that of the Sciences, in 1666; of Architecture, in 1671. He also established the school of Rome, built the Observatory, and in every way did his utmost to advance learning and observation. In all, his practical principle was to trust to rule and organization, and to leave as little as possible to genius or national selection,—and French industry, arts, and sciences have all suffered accordingly.

Literature.

Nor was the case different in literature: here also Colbert desired to encourage and direct; the baneful patronage of kings finds here its highest example. For the true golden age of French literature scarcely touches the active reign of Louis XIV.; it is to Richelieu's time, when at the head of affairs was one who not merely patronized but who warmly interested himself in literature, that the greatest masterpieces belong. The 17th century saw two periods of literary activity, of which the earlier extends to 1661, and is the period of originality and fire; the later runs from 1661 to the end of the century, and (except for Molière and the great preachers) is lacking in character, if improved in taste and style. France has always been justly proud of her stage, little as we may admire its pedantic limitations, its unnatural heroics, and the frigidity of some of its finest efforts: we feel that we are among those who would have thought Addison's *Cato* far superior to Shakespeare. Still, in its own style, French tragedy produced masterpieces, and these chiefly under Richelieu and Mazarin, rather than under Louis XIV. Rotrou, who showed the way, died in 1630; the great Corneille wrote the *Cid* in 1636, *Les Horaces* and *Cinna* in 1639. After 1646 his powers declined, and though he still wrote to his life's end, no one now cares for his *Agésilaus* or his *Attila*. His brother Thomas, a far inferior dramatist, was worthily reserved for Colbert's days. Molière belonged to both ages; his *Précieuses Ridicules* appeared in 1659, *Sganarelle* in 1660, *L'École des Maris* in 1661, while the *Médecin malgré lui* (1666) and the *Tartuffe* (1667) belong to Louis XIV. Racine's earlier period, and the best part of him, extends to 1677; after that he fell under royal influences, wrote nothing for some years, and afterwards became the quasi-religious poet of the court; the *Esther* appeared in 1689 and the *Athalie*, which the French public treated with indifference, was printed 1691. In other lines of poetry Malherbe, the great purist of the century, who, as Boileau sung, "réduisit la muse aux règles du devoir," died in 1628; Benserade, a trifling wit, flourished with pensions from Richelieu, Mazarin, and Colbert; La Fontaine wrote many of his fables in the days of the *Précieuses*, and published his first volume in 1668,—he was one of Fouquet's friends, and therefore not likely to attract the favor of Louis XIV.; Boileau is properly of the later age; satire and comedy seemed alone able to thrive by the side of obsequious oratory.

The Devolution war.

In these palmy days of the reign, Louis XIV. saw with pleasure war break out between England and the Dutch (1664). He was slowly preparing to take part in it against Charles II. when the death of Philip IV. of Spain changed his views completely. He made peace with England in July, 1667 (treaty of Breda), and plunged into those complications of European law and usage which interested him intensely. The Spanish succession question at once came up,—for no one expected Charles II. of Spain to live long or leave posterity; and the immediate question of the claims of the queen of France on a large part of the Spanish Netherlands occupied his energies. Louis and Lionne snapped their fingers at the queen's renunciations of her Spanish rights, and went even further; they made claims which, to modern international law, seem to be utterly indefensible.

1667-1670.

"Jus Devolutionis."

The claim for the Spanish Netherlands was based on the "Jus Devolutionis," the old feudal custom by which certain territories descended to the offspring, male or female, of the first wife, to the exclusion of the children by the second. Now Maria Theresa, queen of France, was daughter of Elizabeth of France, the first wife of Philip IV., while his other children sprang from his second wife, Maria Anna of Austria; and Louis therefore proposed to apply ancient customs of feudal lordship to international matters, to the transfer of territories from one monarch to another. The customs of different districts varied much; in one way or another he hoped to lay undisputed hands on the Netherlands, Hainault, part of Luxembourg, even of part of Franche Comté; he was prepared to support these flimsy claims by the stronger argument of war. To war it came; the king with Turenne overran the Netherlands in 1667; Condé, who was governor of Burgundy, overran Franche Comté in 1668. It was a little war of town-taking; places fell, like ripe fruit, for the shaking. Meanwhile Lionne, busy over the negotiations which sprang out of the succession question, had sketched out a partition treaty, in which Leopold and Louis arranged the whole affair to their liking. With this in hand the king, who had returned in high triumph to Paris, and who knew of Sir William Temple's Triple Alliance, which had been signed in the spring of 1668, made peace as easily as he had made war, and on May 2, 1668, signed the treaty of Aix-la-Chapelle, by which he restored Franche Comté to Spain, and secured the Netherlands.

Treaty of Aix-la-Chapelle.

It was to all appearance a very moderate peace, and much enhanced the king's reputation; men did not know that it was meant to lay the basis for an entire reconstruction of the map of Europe, so soon as ever sickly young Charles II. of Spain had died; and that, every one thought, must follow very soon. The long reign of that prince (who lived till 1700) had much to do with the great wars which followed, and with the consequent exhaustion of France.

The Triple Alliance.

Louis now set himself to break up the Triple Alliance; it was a combination opposed to all the diplomatic ideas and plans of France. Sweden was her old ally; and her policy was to encourage the two sea powers, England and Holland, to weaken one another on the water, so as to give France a chance of constructing a navy. Therefore she was necessarily jealous of the Alliance; nor was it hard to overthrow it. Sweden, as was said, had joined it as a speculation, and had her price; Charles II. of England could easily be bought; Holland thus left defenceless, having lost her barrier of the Spanish Netherlands, could expect nothing but the anger of her new neighbor. But how changed were the world's politics, when the three Protestant powers, England, Holland, and Sweden could unite, even for a short time, for the defence of their ancient foe, Catholic and cruel Spain!

The king's dislike for the Dutch is one of those things which illustrate the evils of personal rule. They were distasteful to him as Protestants, as burghers, as tradesmen, as a sea power, as a constitutional republic; they had given shelter to refugees who could not bear the brilliant despotism of France. Of old times French policy had favored the growth of the United Provinces, as a counterpoise to Spain; henceforward Spain and Holland were friends, and Louis was eager to revise the old lines of his country's foreign relations. So he at once made use of his connection with the small Rhine-princes, those unpatriotic Germans, who were ever on sale, and who almost till our own days sided with France against Germany. With them he arranged for a great flank attack on the republic; he secured England by buying over her king; the wishes and feelings of the people could easily be disregarded in these early days after the fall of the Commonwealth. In 1670 the treaty of Dover, that standing scandal of the Stewart period, was signed; it contained a secret clause, of which the second duke of Buckingham, who negotiated it with the fair duchess of Orleans, sister of Charles II., was ignorant. The two kings played their comedy behind the backs of the two clever negotiators, and laughed in their sleeves at them and at the English nation. Sweden had been easily detached

1671-1672.

Rise of Louvois.

from Holland, and the Triple Alliance entirely swept away within two years of its formation. The efforts made by Leibnitz and others to divert Louis to a Mediterranean war proved utterly unavailing; Colbert's reluctance to furnish the costs of war was overborne; Lionne died in 1671, and was not there to guide the foreign policy of France; Louvois, the "brutal minister whom all men hated," was just rising to the height of his influence, and threw that influence in with the king's prejudices in favor of a Dutch war. Colbert was the man to be pitied; the rapid rise of Louvois, who wielded all the war-power of the kingdom, and whose reorganization of the army drained the resources of the treasury, not only lessened his influence, but made great war-expenses inevitable; and those terrible outlays were by no means undertaken in the wisest direction. In vain did the dry and common-sense minister try the way of flattery: he was too gross; he could not catch the subtle undertones of praise and adoration which pleased the Great Monarch's love of approbation. "We are bound," he writes, "to save a sixpence in things not necessary, and to lavish thousands when thy glory is in question. A hundred pounds for a useless banquet breaks my heart; but when millions of gold are wanted for a great object, I would sell all I have, pawn wife and children, and go afoot all my life, rather than fail to provide it." Such protestations, which did protest too much, such bathos of adulation, could not please the wilful monarch; Colbert's influence henceforward steadily declined, and Louvois climbed into his place, sitting as an evil genius at his master's ear, to whisper war with Holland, the crushing of Genoa, the double ravaging of the Palatinate,—the horror of which survives even to these days in which atrocities are popular,—the dragonnades of Nantes, the revocation of the Edict of Nantes.

The Dutch War.

Parties in Holland.

The Dutch war broke out in 1672, and France had at last a considerable fleet to send to sea. Thirty ships of war joined the English navy, which was pledged to neutralize the sea-power of Holland, and to find employment for Admiral Ruyter's hands. Ruyter was the stay and strength of the aristocratic or burgher party at Amsterdam—the party which had now ruled for years, and had with no small glory rivalled England on the high seas. Little did Louis XIV. deem that by this war of 1672, and by this very alliance with England, he was laying the foundations of that power which would in the end frustrate his splendid plans, and hold up against him the liberties of Europe. The sea-party in the Provinces had resisted and overcome all the efforts of Spain. Louis was now about to overthrow that party, to make room for the land-party, which, led by William of Orange and England, was to withstand him to the end. The sea-party, the aristocratic and commercial republic, headed by the two distinguished brothers, John and Cornelius de Witt, was inevitably hostile to England, and as naturally friendly to France. The land-party, democratic and agricultural, and headed by the great house of Orange-Nassau, was naturally a friend to Germany, with which it had close connections, and to England also; for it was no rival on the sea, and lastly, William, the head of the house, was first cousin to the king of England.

Louvois had raised the army to 125,000 men; the French navy could count about a hundred sail. With almost all this great force Louis began the Dutch war of 1672. Guided by Turenne he set forth for the Rhine, leaving an army to mask Maestricht. The friendly princes gave him passage; the trembling Dutch with a raw ill-disciplined army of scarcely 25,000 men, under command of the prince of Orange, sheltered themselves behind the half-furnished forts of the river Yssel. By crossing the Rhine into the ancient "Betuwe," Turenne hoped to get between the Dutch and Amsterdam, and with one hand to crush the army, while with the other he coerced the seat of government into submission. The plan was simple and good; the earlier stages of it were successfully carried out; the famous passage of the Rhine dazzled the eyes of all France, and, unopposed in fact, and perfectly easy, made Paris believe her monarch to be a complete hero of romance. Turenne at once pushed on and seized Arnheim, which gave him passage out of the Betuwe into the country behind the Yssel; and had his voice been heard, nothing could have saved the prince of Orange. But, with overwhelming force, the king missed completely the point of the campaign. He set himself to reduce the unimportant Yssel forts, led by his own taste for siege-warfare and Louvois's advice; he wasted time and weakened his army by garrisoning the captured places. Presently he moved on and occupied Utrecht; Naarden, half way from thence to Amsterdam, was taken. The Dutch despaired of help, and offered terms to Louis; but he contemptuously refused them. Then the mob of Amsterdam in fury of despair rose on the De Witts and murdered them both, and called on William of Orange to rescue the state. He at once accepted the perilous task, and with equal skill and courage saved the republic, first by flooding the country, so as to defend Amsterdam from a land-attack, and then by arousing the jealousies of Germany and Spain. Louis had gone back to Paris; his armies achieved nothing more in 1672. In 1673 the interest of the war lay in the siege of Maestricht; for Germany was no longer a safe French roadway, and the line of the Meuse was necessary, if Holland was to be reached at all. Maestricht fell; but then no more was done. Louis returned again in triumph to Paris, and the war lagged. At this time (August, 1673) a great league of the Hague was formed against France; its members were the emperor, the Spaniards, and the Dutch; the young stadtholder became the leader of the opposition to Louis XIV. The campaign on the Rhine, in which William of Orange and Montecuculi were pitted against Turenne and Condé, while the duke of Orleans attacked the Spanish Netherlands, went on the whole against France. The allies took Bonn, and thus compelled the Rhine-princes to abandon France. The Great Elector, Frederick William of Brandenburg, who had hitherto leant towards the French, in 1674 joined the allies; public feeling in England forced Charles II. to make peace with the United Provinces. Sweden, jealous of Brandenburg, remained as almost the sole ally of France

1673-1676.

In this year Turenne was charged with the duty of defending the Alsace frontier; the war, from being offensive, had become strictly defensive, except in Franche Comté, which was retaken by Louis in a six weeks' campaign, and the ancient county now fell for ever into the hands of France. When the king's brilliant campaign was over, Turenne pushed forward into the Palatinate, defeated the imperialists at Sinzheim, and then deliberately destroyed the whole country; this was the well-known first destruction of that fair territory. The allies in September crossed the Rhine at Mainz and then at Strasburg, occupying all the plain of Alsace. It seemed as if Turenne could do little to arrest them. He observed them till winter had set in, and then, making his wonderful march along the west flanks of the Vosges mountains, suddenly came out in force at Belfort, and drove the Germans from point to point, till he had entirely cleared them out of Alsace. As the wasting of the Palatinate was the one great blot on his career, so this famous march raised his strategic fame to its highest point. In the north the campaign was not so brilliant; William of Orange lost the hard-fought battle of Senef, and was unable to carry out his plans for penetrating into France. When he had retaken Grave, the campaign of 1674 was over.

The campaign of 1675 on the Rhine was to be once more a trial of strength between Turenne and Montecuculi. The great Turenne, however, was killed by a chance cannon-shot, and the whole plans of the French were shattered. Marshal Créquy was defeated at Saarbrück; the advantages gained by the king in the north, where he had secured the Meuse by taking Liége, Limburg, and Dinant, were altogether neutralized; the army destined for Holland had to help the dispirited army of the east. Condé, who here fought his last battles, upheld the honor of the French arms on the Rhine, and, having secured Alsace for his master, now withdrew from warfare altogether. The age of an inferior series of generals begins.

In 1676 the war was feeble; nothing was done in the north; in the east the Germans took Philipsburg, a place of the utmost value to France before she had got Strasburg. On sea, however, the year was far more brilliant; in the Mediterranean Du Quense in two great battles destroyed the combined fleets of Holland and Spain; and in the second battle off Palermo, Ruyter himself perished. Both France and Holland now began to wish for peace; the Dutch, seeing their navy ruined, and conscious that they could not recover Maestricht, were very weary of war; and the French were also fretting under the burdens of the struggle, which had ruined all Colbert's plans for the development of their commerce and wealth. Troubles broke out in more than

1677.

one district. Negotiations went on, and war also. In 1677 the French arms were more successful; the duke of Orleans, whom his brother never forgave for it, defeated William of Orange at Cassel, and was never again put in command; the French overran all Flanders; the duke of Lorraine was completely defeated by Marshal Créquy. Towards the end of this year William of Orange was espoused to his young kinswoman, Mary, daughter of the duke of York, and early in 1678 King Charles was obliged to declare war on his royal patron. These things swelled the tide in favor of peace. The burgher party of Amsterdam, afraid of William's growing power, leant strongly on that side; Charles II. had never been sincere in his declaration of war, and gladly forwarded the wishes of Louis.

The peace of Nimwegen.

Finally, the peace of Nimwegen closed the war. The first treaty was one between Holland and France, which restored Maestricht, the only place William had not retaken, to the Dutch; a friendly treaty of commerce was attached to it. The second treaty was between Spain and France; while the king restored some strong place to the Spaniards, they ceded a chain of strong frontier-cities to him; France became mistress of Valenciennes, Condé, Bouchain, Maubeuge, Cambrai, Saint-Omer, Aire, Ypres, and other towns. They also ceded Franche Comté, which has ever since been French. Thirdly, there was a treaty with the German princes, which reaffirmed the treaty of Münster of 1648. France ceded Philipsburg, and retained Freiburg in the Brisgau. The peace of Nimwegen was but a starting point for further ambitious steps, yet it formed the highest point of the greatness of Louis. His fortunes seemed to rise a little higher through the "reunion policy" in the next few years; yet he was already beginning to descend from the topmost height. After this peace France could not enough praise and flatter her great monarch; all thought of resistance died away; the needy nobles flocked to his court and begged for place,—they did not dream of asking for power; the king absorbed them into all possible offices—army and navy, finance, in all were to be seen swarms of noblemen; it is to Louis XIV. that the absolute and fatal severance between noble officer and peasant soldier is due. The clergy were kept in fit subjection; no great cardinal now could overshadow the throne; the Jesuits were in full favor,—masters of speech, miracles of persuasiveness, they set the fashion of that age of pulpit eloquence, which is perhaps the most marked of the literary characteristics of the reign. These were the days of Bourdaloue and Bossuet. From this time to about 1685 the French monarchy stands at its highest; Europe is amazed and paralyzed; France if exhausted is full of glory; the king has become more august and magnificent as he has grown older, and now in the prime of life is, as has been said, "if not the greatest king, the finest actor of royalty the world has ever seen." One person, at any rate, was dissatisfied with and suspicious of the peace of Nimwegen; and that was William of Orange. Four days after the peace had been signed, he made a sudden attack on the French camp at St. Denis near Mons. Marshal Luxembourg was taken by surprise; but the French troops soon recovered and drove out their Dutch assailants with heavy loss.

Louis XIV. at his highest.

With this uncalled-for bloodshed the war ended. The history of the next decade of years in France justified to the full the disapproval William had so roughly expressed, though it could not justify the bloodshed and the failure at Mons. It was in these years that abroad and at home Louis XIV. carried out to the full his autocratic ideas,—the king all powerful at home, the kingdom omnipotent abroad. So in this time, while the other nations thankfully disbanded their armies, those of Louis remained on foot. Vauban was named commissary-general of fortifications, a new office, in 1677, and the moment peace was signed began to fortify and secure all the frontiers of France with strongholds which should be at once gateways for aggression and bulwarks against attack.

The system of "reunions."

Finding also that a complete scheme of defences demanded some points which were not yet in his hands, the king began that system of "reunions," as they were called, by means of which he applied old feudal rules to the acquirement of territories and towns in time of peace. Thus, for example, he filched Strasburg away from Germany, because he wanted that ancient Teutonic city to make his eastern frontier safe and aggressive. The peace of Westphalia to which that of Nimwegen, so far as it dealt with Germany, went back, had in it the feudal term "dependencies."

1677–1683.

When it declared a city to be ceded, it spoke of it as being ceded "with its dependencies;" and Louis XIV. having determined to push this phrase to its furthest application, established in 1679 and the following years three "Chambers of Reunion,"—one for the three bishoprics at Metz, a second at Besançon for Franche Comté, the third at Breisach for Alsace. These bodies inquired into all matters of feudal jurisdiction; and as these old usages, specially the episcopal ones, were wide and vague, they formed a convenient basis for decisions in which the claimant was both judge and executor of his own judgments. The French overlordship over many Germanic districts was at once affirmed and acted on; territories were occupied with French soldiers, and the strong points fortified or further strengthened; and before Europe well knew what was doing, the frontiers of France had been pushed forward into Germany, and so strengthened as to make it very difficult to wrest them again away. The Breisach chamber thus secured almost all the lordships in that district, and succeeded, partly by legal argument, partly by bribery, lastly by force, in winning Strasburg in November, 1681. At the same time by secret agreement with Charles III. of Mantua, the last of the Gonzaga-Nevers dukes, Louis XIV. became master of Casale, which seemed to secure his permanent influence in northern Italy. The capture of Luxembourg, Courtrai, and Dixmuyde, in the little war with Spain which was waged in 1683–1684, set the French frontier well forward on the north side of the three bishoprics. All went well with the monarch in these days. Unfortunately for his glory he had still thirty-two years of reign before him; and these years, the period of Madame de Maintenon, are crowded with blunders, darkened with misfortune. "Here ends," (in 1683), says the duke of Saint-Simon, "the apogee of this reign,—the height of its glory and prosperity. The great captains, the great home and foreign ministers, are no more; only pupils and disciples remain. We are now to see the second age, which will fall short of the first, though it will be far better than the third and last period of the reign." Colbert died in this year; in this year John Sobieski drove the Turks from the walls of Vienna; and from the day of their defeat, the fortunes of the Ottoman allies of France also began to recede. Above all, in this same year Louis XIV. was privately married to Madame de Maintenon, and she, with unbounded influence over him, intentionally or not, had a share in the worst errors of his reign.

Madame de Maintenon.

Françoise d'Aubigné was a Huguenot by birth and breeding; in 1652 the comic poet Scarron, a cripple, and, as he called himself, "an abstract of all human miseries," married her when she was penniless and friendless; eight years later she was left a widow, and again without resources. She had a soft and gentle beauty, a grace and tact, a cold temperament and placid manner, which recommended her, by way of contrast, to Madame de Montespan, the violent and dangerous beauty who for several years reigned supreme over Louis XIV. At her suggestion poor Madame Scarron was engaged, in 1666, as a kind of nursery governess to her children, the duke of Maine and a daughter. It is curious to see how great are the contrasts in her history. At first Louis was offended and hurt at the introduction of this person at court; she seemed odious to him. He gave her the little Maintenon estate with a stipulation that he should see her no more; he thought her a precise and disagreeable *précieuse.* She had been the wife of a playwright, the centre of a little literary coterie; the king, with his instinctive dislike for literature, felt a distaste, almost an aversion, for her. Her placid temperament stood the trial well; after a time, when Madame de Montespan was unusually imperious, he would betake himself to the sweet gentleness of the governess, and cool his heated temper in her calm society. Her influence was all for good; she weaned him from Montespan, and did not take her place; she reconciled him to his poor queen, whom he had so long and so scandalously neglected; and when the queen died in 1683, the governess became the king's wife, and queen in all but name. She never was publicly acknowledged; still her position was recognized, and her power felt. Louis worked with her, consulted her in all things; she was a warm friend to the high Catholic party; though not openly subject to Jesuit influences (her early training making that

Bossuet's four propositions.

Revocation of the Edict of Nantes.

unlikely), she did work which the Jesuits could not but like. The king, naturally religious in a stiff and ignorant way, and Madame de Maintenon, narrow, placid, and obstinately afraid of intellect or independence, worked together towards the same ends. The necessity of disarming any suspicion the king might feel as to the leaven of Huguenot opinion still fermenting within her led Madame de Maintenon often to countenance things which she could not in heart have approved. She had known the light, and could never afterwards have fallen into utter darkness. Jansenists and Huguenots, in these years, felt the king's dislike increased; the eagerness for the submission of the one, the conversion of the other, grew day by day into an absorbing passion. And Louis had had no small temptation to interfere with the Jansenists. They held opinions which, his Jesuit advisers assured him, were of a fatal wrongness; and in 1682 they had sided to a great extent with Innocent XI. against him. His horror of independence of views combined with his horror of a divided allegiance, and led him to act promptly against them. He convoked a great assembly of clergy, which, under the influence of Bossuet, drew up those four articles which have often been quoted as the clearest statement of the liberties of the Gallican church,—liberties, that is, as face to face with the pope, not as against the royal power. These articles affirm (1) the independent authority of the secular power; (2) the superiority of general councils; (3) the inviolable character of the Gallican usages; (4) the fallibility of the pope except when supported by the assent of the church. There was talk also of a Gallican patriarchate, so far did the quarrel go. The Jansenists, the "Ultramontanes" of that day, seemed to side with pope against king. In these years the papacy and the monarch were not on good terms together. Innocent XI. looked with favor on the growing resistance, and rejoiced when Protestant William overthrew Catholic James of England. The Jansenists were thus kept down; the Huguenots were more severely treated, Louvois, unluckily for them, here taking the lead. Great numbers were bribed or threatened into giving up their opinions, others were driven to it by actual hard usage, until in 1685 Louis, believing that all had been converted except a small stiff-necked remainder, with whom he need not scruple to deal sharply, finally ordered the revocation of the Edict of Nantes, and therewith the total abolition of all the privileges unwillingly granted ninety years before to the Huguenots, and always permitted with a grudging hand. The severities of 1685, and the exodus of the Huguenots, finally brought that party to an end as a political organization. Whatever difference of opinions there may be as to the numbers who fled from the kingdom at this time, there can be no doubt as to the quality of them. They were the thriftiest and readiest hands in France; they carried the arts and taste which were till then the special gift of their country, to Spitalfields, or Amsterdam, or even to Berlin. They crowded into the armies which were arrayed against their oppressor; they helped to man the ships which destroyed the navy of France; they planted their industries in many places, and gave that wealth and prosperity to other lands which was driven from their homes. In England they influenced opinion not a little, and steadfastly supported the house of Orange against the Stewarts, friends of the king of France.

The league of Augsburg.

War with Germany.

In this same year 1685 Louis pushed his plans in Germany also further than was prudent. He alarmed the greater princes by intriguing, seriously or not, for the imperial dignity, against the next vacancy; he alarmed the Rhine princes also by claiming the Lower Palatinate for Charlotte Elizabeth of Bavaria, the Princess Palatine, who had married the king's brother the duke of Orleans, and who in this prime of her fortunes and brilliancy almost scared the dismal court with her bright sallies and the freedom of her tongue. When the princes heard this claim, coming so soon after the loss of Strasburg, a claim which would have brought Louis into the very heart of Germany,—they hesitated no longer; and in July, 1686, was signed that great league of Augsburg which was the beginning of the long struggle between France and the rest of Europe. The emperor, the king of Spain, the Dutch, the elector of Saxony, the Palatine elector, and a number of lesser princes, all joined it; in 1687 the pope secretly acceded; the duke of Savoy and the elector of Bavaria also came in; the soul of the combination was William of Orange. It is a strange moment of history in which the pope and the emperor, the king of Spain and the elector of Bavaria, unite to resist the advance of Catholic France and the Catholic king of England. The league was at first purely defensive, and for two years held simply an observant and ready position. The tension, however, was too great, and by 1688 Louis saw clearly that peace could not last much longer. France had had peace for ten years, yet her strength had not increased; for the court had been very profuse in these days, and the "reunions" had cost somewhat,—the exodus of the Huguenots still more. The works at Versailles had wasted men and money; the great ministers and generals were dead, and the country was surely drifting into war again. In the last war the king's armies had followed two lines—that of the Rhine and that of Flanders. Then, however, war was being made on the Dutch alone; now it would have to be against the Dutch and Germans combined. To all appearance the hostility of Germany was likely to be more dangerous than that of Holland, and the Rhine had been proved to be the best roadway of attack for both countries. For this purpose the Cologne country, the electorate and its territory, appeared to Louis to be of the utmost value to him. Occupied with this idea, and not realizing either the force of the character of William of Orange, or the depth of dissatisfaction against James II. in England, the king now committed the great blunder of his life. A small demonstration against Holland would have made it impossible for William to make his attempt on England, and would have cost France very little in expense or risk. But when it came to decision, Louis and Louvois, here as ever his evil genius, were both in favor of securing the influence of France on the Rhine; both thought the dynastic question involved in the Palatinate to be more important than the great European question involved in the plans and movements of William. Moreover, the vacancy in the electorate of Cologne in 1688, in which question the pope was openly opposed to the king's nominee, excited the royal pride, and made interference in Germany a point of honor; a French garrison was sent to occupy Cologne. For these reasons Louis, underrating the danger elsewhere, and thinking that a threat would keep the timid Dutch quiet, despatched the dauphin to the east with the main army in September, 1688. He took Philipsburg; the Palatinate and the three Rhine electorates fell easily into his hands.

The English Revolution.

Affairs in Ireland.

Immediately William, freed from his worst anxieties, set sail for England, and the Revolution took place at once and without bloodshed. The Declaration of Rights was issued by parliament in February, 1689, and William and Mary were seated on the throne of England. James II. took refuge at the French court, and was established at the palace of St. Germains; his presence in France, and that of his family, becomes an element in the politics of more than half a century. And now Louis recognized the error he had committed; his troops were withdrawn from the Palatinate, which (again at the advice of Louvois) had to undergo that scathing of fire and sword which moved the feelings of all Germans, and gave earnestness to the war. Early in 1689 the Diet of Ratisbon declared war against France. The great duke of Marlborough, now only General Churchill, defeated the French at Walcourt near the Sambre; the French were also thrust back into Alsace and Lorraine. King James was furnished with a strong force of troops and ships, with which he landed safely in Ireland, and almost all the island declared for him. A French-Irish court was established at Dublin. William III. sent Schomberg to the north of Ireland to make head against this great danger; and William himself followed so soon as ever he could venture to leave England. Things were looking very serious for him. The French had kept up communications with Ireland without difficulty; the English fleet was not thought to be loyal to the new government, for King James had been a sailor, and many of the higher officers were held likely to side with him. The battle of the Boyne (1st July, 1690), however, cleared away this peril. James lost heart, and fled to France; in a very short time the ascendency of William III. was secured in Ireland. It was not too soon. A very few days after the battle of the Boyne, Tourville, commanding the French fleet, had defeated the Anglo-Dutch navy

1691-1697.

off Beachy Head; and in the same month, Marshal Luxembourg won the battle of Fleurus from Waldeck with his German and Dutch troops. In Piedmont Catinat inflicted a grave defeat on Victor Amadeus at Staffarda. Still, the war of 1690 was in the end indecisive, thanks to the battle of the Boyne. In 1691 Louis seemed determined to make a greater effort, and himself besieged Mons, which he took in spite of the attempts of William to relieve it. Little, however, followed after the fall of Mons; the year was marked by the death of Louvois, whose brutal energy had done much to sustain the war. The campaigns of 1692 were to be differently planned; in Catalonia, in Piedmont, and in Germany, there should be no offensive movement; the whole energy of the nation should be staked on a fresh descent of King James in Ireland, and on a land attack on the Netherlands. The war was therefore to be a duel between Louis and William. Tourville was ordered to engage the English fleet wherever he might meet it; it was believed that Admiral Russell and half the ships would desert in action. The experiment was tried off Cape La Hogue, and with disastrous results to the French arms: it was the ruin of the French fleet, the shipwreck of King James's cause. In the Netherlands Louis in person invested Namur, and, again baffling William III., took that strong place, which carried the line of the Meuse, in June. This, which might have been the decisive success of the war on land, brought with it no results; the victory of Steenkirke, in which Luxembourg defeated William, ended the Netherlands campaign. Elsewhere, as had been planned, the operations of the war were insignificant. The campaigns of 1693 were also indecisive; although Luxembourg again defeated William at Neerwinden, the capture of Charleroi was the only result. The aggressive period of the war was coming to an end. In 1694 it became almost entirely defensive; and the death of Marshal Luxembourg in the first days of 1695 took from Louis his most fortunate general. Villeroy, who succeeded him, was a poor officer; the ancient credit of the French army was upheld by Vauban and Catinat. The war in that year was exceedingly languid. The generals were afraid of the court; the king rewarded and promoted the less able over the heads of the more capable. The recovery of Namur by William III. in this year showed how France had lost strength since 1692. In 1696 Louis succeeded in detaching Victor Amadeus from the allies by abandoning Casale and Pinerolo to him, and securing to him his Savoyard territory; and the duke's daughter was betrothed to the duke of Burgundy, the eldest son of the dauphin, the father of Louis XV. This defection of Savoy, the appearance of Catinat in the Netherlands in 1697, the renewed vigor of the French arms, the difficulty of governing England now that Queen Mary was dead, at last led William III. to accept the mediation of Sweden.

The peace of Ryswick.

1697-1700.

The Spanish succession.

The partition-treaties.

Louis XIV. was at least as willing to come to terms; France was worn out with the long war and its great sacrifices; and, above all, it was seen that Charles II. of Spain had not long to live. To be ready to deal with the great questions of the Spanish succession Louis agreed to terms which he otherwise would not have granted. The peace of Ryswick in 1697 was soon agreed to. Louis recognized William III. as king of England, and Anne, second daughter of James II., and a decided Protestant, as his successor. He ceded to the allies all places won from England, Holland, or Spain since the peace of Nimwegen, and consented to a Dutch garrison in each of the Spanish-Netherland barrier fortresses. These three powers had no fault to find with the treaty of Ryswick; Germany, however, was not so well pleased. She had made war chiefly to reduce the French hold on the Rhine; William had pledged himself that Strasburg should be restored; but, as neither England nor Holland would support him in demanding this of Louis, he was fain to make peace without it. The emperor and the princes were very unwilling to come in; at last, however, they signed a separate peace, in which they got back all places taken by France since Nimwegen, excepting Strasburg, and recovered all the strongholds on the right bank of the Rhine. Lorraine was restored to its German duke; the French candidate for the electorate of Cologne was abandoned; and the claims of the Princess-Palatine on the Lower Palatinate commuted for a sum of money. Germany had fair cause therefore to be well pleased with the result. Louis now turned all his attention to the Spanish question; and the failure of his candidate for the throne of Poland, the prince of Conti, in 1697, perhaps made him all the more anxious to prepare the way for the great triumph which he hoped might be won at Madrid. The closing years of the century were passed in active negotiations for this object. The three houses which hoped to gain by the death of Charles II.,—for nations were now treated as the private inheritance of princes,—were the house of Bourbon, the house of Austria, and the house of Wittelsbach. Austria and France desired to acquire the whole heritage; the Bavarian elector would have been satisfied with a partition. The emperor Leopold, head of the house of Austria, desired the Spanish throne for his younger son the archduke Charles, nephew (by marriage) of Charles II., and grandson of Maria of Spain, spouse of the emperor Ferdinand III.; he was therefore only very distantly related to the dying king. Louis XIV. claimed, in spite of renunciations, for Philip his grandson, grandson of Maria Theresa, half sister to Charles II.,—Philip's elder brother, Louis duke of Burgundy, waiving his claim on his behalf. Lastly, Maximilian Emmanuel, elector of Bavaria, claimed for his son Joseph Ferdinand, on behalf of the child's mother, Maria Antonia, daughter of Leopold I. and Margaret Theresa, daughter of Philip IV. of Spain. Leopold I. was the only male cousin of the Spanish king, and his nearest male relation; and Charles II. had also married Maria Anna of Neuburg, Leopold's sister-in-law. Moreover, his rights had never been renounced, while Maria Theresa, on marrying Louis XIV., had renounced hers, and so also had Maria Antonia, mother of the Bavarian electoral prince. The knotty question, however, was not to be solved by paper-considerations; it was a matter for the law of the stronger, and the more unscrupulous; Louis XIV. therefore won. William III., earnest in his desire for peace, and anxious that France should get no additional strength, threw in his lot with the Bavarian prince, and thought that such a partition might be made as would satisfy all. Charles II. also was strongly in favor of the same cause, and made a will in favor of Joseph Ferdinand. This, however, pleased neither Austria nor France, and Count Harrach, the Austrian envoy, got the will annulled, though he could not persuade the king of Spain to recognize the archduke Charles as his heir. Directly after the signature of the peace of Ryswick, Louis XIV. sent the Marquis d'Harcourt, a most successful choice, to represent his interests at Madrid, and ordered Tallard to amuse William III. with a scheme for a partition-treaty. Harcourt was to intrigue for the whole succession at Madrid, while Tallard should make sure of a part at St. James's, in case Harcourt's difficult mission failed. William III. was only too glad to enter into the scheme; and a first partition-treaty was drawn up, by which France, Austria, and Bavaria each should get its part. This treaty Louis used against itself; for it was one of the most cogent arguments by which Harcourt succeeded in persuading the Spanish court and people that if they would keep the great inheritance unbroken, and not destroy the ancient kingdom, they must have the French prince as their future monarch. In spite of much ill-will and great discouragement, Harcourt won his way into the complete confidence of the court of Spain, and utterly outstripped the rough and unwise Austrians. Early in 1699 the young electoral prince died, and the first partition-treaty became void. A second treaty followed, though it was not accepted by Austria; and Louis XIV. in accepting it had no intention of keeping his word, unless it suited him to do so. French influences, from the moment that this second treaty became known at Madrid, were omnipotent with the Spanish court; and in 1700 Charles II. signed another will, in which he left the whole of the grand inheritance to Philip duke of Anjou. After some simulated, and perhaps a little real hesitation, Louis XIV. accepted the will for his grandson, and enjoyed for a brief while the triumph that it brought,—the triumph of successful diplomacy and of a vastly enlarged influence and power. As time went on, it became clear that the king of Spain would not always be the obedient servant of the king of France, and that the connection between the monarchies was a source of weakness rather than of strength.

Philip of Anjou becomes Philip V. of Spain.

War did not break out in consequence, as had been expected; the English, who had disliked the partition-treaties, even preferred the acceptance of the will by Louis XIV. to the cause for which William, with his larger views of European politics, desired to fight; and Philip of Anjou became king of Spain. Louis XIV. protested at once against the view that the two crowns of France and Spain should never be united,—though he had used their certain separation as an argument to influence Spanish opinion,—and reserved the rights of Philip V. to the French crown; in 1714 there was only one person, and he a sickly child, between him and the hereditary right to the crown of France. Though war did not follow at once, it could not long be delayed, and meanwhile Louis XIV. did all he could to strengthen himself. Early in 1701 he made an agreement with the elector of Bavaria, governor of the Spanish Netherlands, and ejected the Dutch troops from the barrier fortresses. It was a haughty denial of the validity of the peace of Ryswick; and, in open violation of the spirit of the same treaty, he soon after, on the death of James II., recognized James Stewart, his eldest son, the "Old Pretender," the "Chevalier de Saint George," as king of England, under title of James III. About the same time the Germans and Dutch, thoroughly alarmed, signed at the Hague a great treaty, "the Grand Alliance," with William III., and bound themselves to restore the Netherlands barrier, to regain the Milanese territory for the empire, to win for the emperor all the Italian and Mediterranean possessions of Spain, to attack and take the Spanish Indies. The emperor, without delay, sent Prince Eugene, his greatest general, to begin the war in Italy; the double-dealing Victor Amadeus, the skilful strategy of the prince, the excellence of the fresh troops under his command, were too much for Catinat, who was obliged to fall back. Louis, who never had liked his best general, was not at all sorry, and sent Villeroy, one of his worst, to supersede him. Villeroy speedily justified his choice by losing the battle of Chiari (1701); almost the whole of the Mantuan territory fell into Prince Eugene's hands. After the surprise of Cremona, early in 1702, Vendôme, who, indolent as he was, was a good general, replaced Villeroy, and by the indecisive battle of Luzzara (August, 1702) recovered some of the lost foothold of France in Italy.

The war of the Spanish succession begins.

Ere this war had broken out on all sides. The death of William III., and the accession of Queen Anne, early in 1702, made no change in the arrangements of the allies for their four campaigns,—the Italian campaign, which was least in importance; the Belgian, in which they aimed at the fortresses; the German, chiefly on the Danube; the Spanish, in which the archduke Charles struggled for the crown. Catinat, transferred to the Rhine, and ill-supported by an unfriendly court at home, the ill-will of which was reflected in the conduct of his officers, could not make head against the prince of Baden, who crossed the Rhine and took Landau. Catinat, who soon after this sent in his resignation, was coldly allowed to withdraw, and France thus lost the most prudent and capable of her remaining generals. The elector of Bavaria was the only strong and true friend the courts of France and Spain had in this war; he bore the brunt of the early periods of it. Louis of Baden had occupied in force the strong elbow of hills and forests between the valley of the Rhine, and that of the Danube, thereby threatening the elector, and hindering him from joining the French. His position was very strong; yet Villars, who was ambitious and lively, and longed for the marshal's staff, determined to attempt the task of driving him out. He accordingly crossed the Rhine, and attacked the Germans at Friedlingen (14th October, 1702), and by good fortune rather than by skill defeated them. His success, however, was not such as to enable him to shake Louis of Baden; he could not even penetrate into the Black Forest. In the Netherlands Marlborough strengthened his position by taking a group of towns, and keeping Marshal Boufflers and the duke of Burgundy actively employed, as they retreated before him from point to point. The defeat of the French fleet in Vigo Bay, and the outburst of the Protestants of the Cevennes mountains, both added largely to the difficulties of France. In the winter Marlborough enlarged his base of operations by occupying the electorate of Cologne, and early in 1703 he had cleared out all the Spaniards in his rear or on his flank. Before the end of 1703 everything was ready for that great advance which was destined to raise his fame to its highest point. And it was time that he went, as he said, "to teach the Germans how to beat the French;" for in 1703 Villars had been very successful in Germany; he had forced his way through the Black Forest, and had joined the elector of Bavaria in the upper valley of the Danube; and the elector had already driven the Austrians down the valley to below Passau. A threatened attack on Vienna came to nothing. Towards the end of the campaign the elector and Villars drove Louis of Baden from his positions, and defeated Styrum at Höchstatt; Tallard, with the army which had watched Louis of Baden in the lines of Stolhofen, returned to the Rhine and took Old Breisach and Landau, as well as won the battle of Spires. On this side the war had been very favorable to France,—an advantage against which the transfer of Savoy and Portugal to the side of the allies had to be set.

Marlborough's campaign of 1704.

These changes, and the continued resistance of the Huguenots in the south of France, enabled Marlborough to arrange with Prince Eugene his great campaign of 1704, in a conference near Heilbronn. Here the so-called triumvirate,—Marlborough, Eugene, and Heinsius—England, the empire, and the Dutch,—laid their plans to neutralize the French advantages in Bavaria, and by cutting the line of their communications, to relieve Vienna from all anxiety. The peril to Austria was great, for the French and Bavarians formed a long unbroken line from the Vosges to Passau. Quite early, therefore, in 1704, Marlborough began to move; he misled Villeroy and Boufflers, who were watching him, and crossed the Rhine at Cologne, with a view to joining Prince Eugene, who held the famous Stolhofen lines. The French and Bavarians drew together to meet this formidable attack; the elector entrenched himself near Donauwörth; Villeroy and Tallard observed the Stolhofen lines. Marlborough, with Prussian and other help, passed through Mainz, crossed the Black Forest, and came out in the Danube valley, joining Louis of Baden near Ulm. Their united forces defeated the elector and took Donauwörth. Thus doing, they had placed themselves between him and his French allies, Marsin and Tallard; and Marlborough, feeling his communications to be critical, and rather alarmed as to his position, drew back up the Danube, till he had effected a junction with Prince Eugene. The elector had also joined his French friends, and they lay in wait for their antagonists in a strong position on the left bank of the Danube, between Höchstatt and Blenheim. There, on the 13th August, 1704, was fought the great battle of Blenheim. The French and Bavarians had the superiority in numbers and position; this, however, they neutralized by faulty arrangements, and by shutting up a large force in the village of Blenheim. The battle was hot and heavy, and the loss to the allies, who were the assailants, great. Eugene made little impression on the lines, but towards evening Marlborough succeeded in breaking through Tallard's position. Thereby he cut the enemy in two, and the French cavalry fled in panic towards Höchstatt. Many were drowned in the Danube; Marsin and the elector drew off in good condition towards the Black Forest; Tallard was a prisoner, his whole force either dispersed or taken. It was the worst mishap that had ever befallen Louis XIV. Bavaria was entirely subdued; Austria and the empire saved; the elector took refuge in France. Louis of Baden was able now to cross the Rhine; Landau again fell into German hands; Marlborough returned to the Moselle, taking Trarbach and Trèves. The war drew nearer to the frontiers of France, and Germany ran no further risk of invasion.

The battle of Blenheim.

In 1705 the duke's plans for an attack on France were neutralized by the slowness and jealousy of Louis of Baden, who did not care to play second to "the handsome Englishman." The Cevennes insurrection being now over, Villars was free to face the allies, and did so with such skill and success that Marlborough was obliged to fall back towards the Netherlands. On the other hand, Louis XIV. weakened Villars in order to strengthen Villeroy in the Netherlands; so that the campaign of 1705 ended without any decisive operations. Not so 1706, the great year of the succession war. Louis XIV. fully intended that the Netherlands' campaign should have in this year decisive results. It was unfortunate for him that his personal likings led him to place in command on that side the incompetent Villeroy, who had to grapple with the victorious troops and masterly generalship of Marlborough. The result was that the duke easily won the great victory of Ramillies (23d May, 1706), which was as decisive as Blenheim; for as Blenheim swept the French out of Bavaria, so Ramillies made them powerless

The campaigns of 1706.

1706-1708.

in the Netherlands. The allies took Louvain, Brussels and Malines, Ghent and Bruges, all in the name of the archduke Charles, whom they proclaimed king of Spain as Charles III. Antwerp, Oudenarde, all Brabant, accepted him at once. His fortunes seemed equally good elsewhere. The alliance between England and Portugal in 1703 had given a turn to warfare in the Peninsula.

War in Spain.

The archduke in 1704 tried to penetrate into Spain from the Portuguese frontier; this failed, partly from the difficulties of the country, and partly from the ability of the duke of Berwick, a natural son of James II., and nephew of the duke of Marlborough, one of the few real soldiers in the service of the king of France at this time. On the other hand the English fleet under Rooke, which was waiting on the archduke, by a stroke of happy audacity surprised Gibraltar (4th August, 1704), and occupied it in strength. The utmost efforts of the French, under the count of Toulouse, one of the natural sons of Louis XIV., failed to recover this all-important rock. The battle of Malaga, though the French fleet had the best of it, damaged their navy so seriously that they could attempt no more; and in the exhaustion of France it proved impossible to refit the ships, or continue the struggle on the seas. In 1705 Charles III., unmolested by them, sailed round Spain, and landed at Barcelona. The Catalans and Aragonese were inclined to support him, while proud Castile held by Philip V. These were the days of the romantic career of the earl of Peterborough. In 1706 the French and Castilian siege of Barcelona came to nothing; the party of Charles took heart, and supported by English, Portuguese, and French refugees, drove Philip out of Madrid, and placed their candidate on the throne.

In Italy, the death of the emperor Leopold having called Prince Eugene away, Vendôme with unwonted energy defeated the Austrians at Calcinato, and swept the allies out of all the Milanese territory. Turin alone remained in the hands of Victor Amadeus II., and was the object of a fierce siege. Prince Eugene, however, returned in time to save the capital; for Vendôme, after Ramillies, had been ordered to the Netherlands, and the change of commanders was everything to the allies. Prince Eugene attacked the French lines at Turin; differences sprang up between Marsin and the duke of Orleans (the nephew of Louis XIV.), and the Austrians won a great victory. Marsin was killed; the French army would not obey the duke; the whole force melted away, and Italy fell completely into the hands of the allies. Thus in the Netherlands, Spain, and Italy, their fortunes by the autumn of 1706 seemed to be completely triumphant. In Spain, however, the Castilians succeeded in ejecting Charles III., and in replacing their favorite Philip V.; and in the opening of 1707, the victory of Almanza, gained by Berwick over Ruvigny, a French refugee officer of ability, finally settled the Spanish question in favor of the Bourbon dynasty. A treaty of neutrality for Italy, by which the emperor Joseph I. secured his conquests there, also released Louis XIV. from some of his anxieties.

The campaigns of 1707 were as unimportant as those of 1706 had been decisive. The appearance of Charles XII. of Sweden in Germany paralyzed both sides a while; Villars, in command on the Rhine, stormed the Stolhofen lines, and pushed into Bavaria, hoping that the Swede would join him with his invincible Scandinavians. Charles, however, cared not to unite his fortunes to the Catholic side, and after some delay marched eastward towards Poland. Villars fell back to the Rhine; Vendôme quietly watched Marlborough; on the sea Duguay-Trouin, the most brilliant of French captains, harassed the Anglo-Dutch commerce, and won very considerable advantages over the English fleet. In 1708 an expedition for Scotland failed completely; and in the Netherlands the duke of Burgundy and Vendôme were caught by Marlborough and Eugene at Oudenarde (11th July, 1708), and utterly defeated. The allies crossed the French frontier and sat down before Lille,—Eugene besieging, Marlborough protecting. By the end of the year the place had fallen into their hands, after a brilliant defence, which, though unsuccessful, won for Marshal Boufflers the distinction of duke and peer of France. Ghent and Bruges, with all Flanders, were secured by the allies; their light cavalry overran northern France, and appeared almost at the gates of Versailles.

1709-1712.

The straits of France.

The fortunes of France now seemed to be at their worst: famine and a bitter winter closed the disastrous year; everything was at a standstill, trade completely ruined, finance in a dreadful state; even the king began to despair, and to negotiate for peace. He had felt his way thitherwards in vain in 1706; now in 1709 he made serious offers. The allies treated his proposals with great severity;

Louis proposes terms.

he was willing to dismantle Dunkirk and ruin its port if Lille were restored to France, to give up his grandson's throne of Spain if Philip might have Naples; he did not absolutely refuse to abandon the electors of Bavaria and Cologne. With such concessions peace was not impossible. The allies, however, insisted on stipulations which touched the old king's personal honor, declaring that as Louis had placed Philip V. on the Spanish throne, he must, with his own troops, if necessary, dispossess him of it again. They also demanded the cession to Germany of Strasburg and Breisach, the erection of a new line of barrier-fortresses between Holland and France, and other lesser matters. To these Louis would not consent, and the negotiations broke down. He appealed warmly to the country to support him, and was answered by an outburst of patriotism which enabled him to send Villars, at the head of a good army, into the Netherlands.

Malplaquet and its effects.

There he fought the great battle of Malplaquet (11th September, 1709), in which Marlborough and Prince Eugene were again victorious, though their losses were tremendous, as they had been obliged to attack a very strong position held by a powerful army. The fall of Mons was the only advantage which resulted to the allies; with that the campaign came to an end. While the battle actually restored the spirit of the French soldiers, who had been skilfully and successfully withdrawn from the field by Marshal Boufflers, it produced a very bad feeling in England. There men were very weary of the war, and the carnage at Malplaquet had been terrible. Louis again offered large concessions to the allies in 1710; the triumvirate, however, were not content to make peace, and still demanded what they knew he would not consent to—his personal interference against Philip V. The campaign of 1710, which followed, was intended to strengthen the allies, with a view to their penetrating the next year into the heart of France. Douai, Bethune, and some lesser places were taken; Villars covered Cambrai and Arras; in Spain Charles III. again entered Madrid, though he was unable to hold his ground there, and before the year's end Philip V. was again triumphant.

Change of opinion in England.

In this gloomiest state of French affairs, when all was in confusion and despair, the old king at bay and too infirm to head the remnants of his armies, the allies firmly planted in northern France, it was believed that, if they could but hold together, they would in one more campaign succeed in entirely breaking the power of their great rival. In England, however, that change of opinion had begun which saved Louis from this last humiliation. The Tory party, vehemently opposed to Marlborough and the war, were gathering strength; the elections of 1710 went in their favor, and early in 1711 the fall of the duchess of Marlborough at court told every one that the reign of the Whigs was over. The death of Joseph I., the emperor, by placing Charles III. on the imperial throne as Charles VI. (December, 1711), changed the whole position of affairs, and made men still more unwilling to carry on the war. It was felt that Europe could no longer sacrifice herself to place him on the throne of Spain as well as that of the empire, and to create a power which might endanger the stability of Europe, and overthrow the balance at which men were aiming. The warfare of 1711 was languid; Prince Eugene was called away to the imperial election; Marlborough and Villars long watched each other on the northern frontier of France. The only result was the capture by the allies of Bouchain, and the arrangement by Marlborough of "a grand project,"—a plan for the invasion of France in the next campaign, when he hoped to have Eugene by his side. In the winter, however, the duke was overthrown at St. James's, and his plans came to nothing. Negotiations for peace were far more to the taste of the Tories than a vigorous foreign policy; and it was announced, late in 1711, that Utrecht had been chosen as a place of conference; the bases of an agreement were easily arrived at. In 1712 the duke of Ormond replaced Marlborough in the Low Countries; his business was to neutralize the Dutch and Germans, who were still eager

1712-1714.

The peace of Utrecht.

for war; and in May England signed a separate truce abandoning her allies. They continued the war a while, but after being sharply defeated by Villars at Denain (24th July, 1712) they accomplished nothing more; the French retook Douai, Le Quesnoy, and Bouchain. Then the Dutch gave up all thoughts of further war, and came in to the English truce; war ceased on all hands, and negotiations went on merrily at Utrecht. At last, in April, 1713, peace was signed by all the powers except the empire on the basis of the treaty of Ryswick. The Germans, thus once more abandoned by their allies, found it impossible to continue long. Villars outgeneralled Prince Eugene, and by defeating him before Freiburg in the Brisgau, and taking that town, showed to the emperor that he also would do well to come to terms. In 1714 two more treaties were signed by the princes of the empire and the Austrians, and the Succession War at last came to an end.

Results of the Succession War.

England was the chief gainer: she secured her succession through the house of Hanover, which now became a ninth electorate; the Pretender was to be compelled to leave France; the crowns of France and Spain were never to rest on one head; Dunkirk was dismantled; Newfoundland, Acadia, and the Hudson's Bay Territory were transferred from France to her; a friendly commercial treaty followed. Holland got a strong barrier on the side of France; the Spanish Netherlands were handed over to the United Provinces, which undertook to transfer them to Austria on the final conclusion of peace. She, too, made a favorable commercial treaty with France. The duke of Savoy was made a king and got Sicily, while Austria received Naples and Sardinia. Prussia received part of Gelderland, and gave up to France all her claims on the Orange principality. England was recognized as mistress of Gibraltar and Minorca. France recovered Lille, and retained Strasburg and the whole of Alsace. Freiburg in the Brisgau, Breisach and Kehl, she had to restore to Germany; the rights of Philip V. to the throne of Spain remained unshaken; the resistance of Barcelona, which obstinately refused to recognize him, was overcome by Berwick in 1714. Far lighter were the terms of peace than those which the triumvirate had tried to force on Louis XIV.; yet the aged monarch must have deeply felt the permanent retrogression which they involved. His splendid ambitions were shown to be unattainable, after they had well-nigh ruined France in the pursuit; she had paid already a terrible price for the glories of a grand monarch and a great age. It would require the awakening of the Revolution to restore her to her right place in Europe. Her old antagonists, Austria and Spain, were also losers by the war; north Germany, under the guidance of the new kingdom of Prussia, was destined gradually to reduce the supremacy of the south, and at last to take its place; England was fitted for the great destinies she was to fulfil in the course of the century; Holland, secure from all disturbance, withdrew from the political arena.

The calamities of France.

A short time before the conclusion of the peace, when things were almost at their darkest for France, domestic losses in appalling succession had stricken down the king. In April, 1711, the dauphin died; early in 1712 the duke and duchess of Burgundy and their eldest boy were carried off by fever; in 1714 the duke of Berry also died. And now of the direct line of the Bourbons remained only Louis XIV. and his great-grandson, the duke of Anjou, the future Louis XV. If the arrangements as to the Spanish crown held good, the dissolute duke of Orleans, whom Louis XIV. disliked and shunned, was the next heir after the little Louis. The country was famine-stricken and most miserable, finance in hopeless confusion, the debt grown to vast size; an annual deficit had long been going on. The whole of the institutions of the country seemed to have fallen into ruin. The nobles had become needy hangers-on at court; they filled the army, and by making it impossible for merit to rise had contributed largely to the disasters of the Succession War.

1715.

Death of Louis XIV.

The brief remainder of this long reign was of little importance. The ignoble persecution, which had overthrown Port Royal in 1710, continued against the Jansenists to the end; and 1714 Louis tried to strengthen Madame de Maintenon's party against that of the duke of Orleans by decreeing the legitimization of his bastard sons by Madame de Montespan—the duke of Maine and the count of Toulouse,—and by making a will to secure the regency to the duke of Maine and Le Tellier, his Jesuit confessor. Then on the 1st of September, 1715, he died, leaving the crown of France to his great-grandson Louis, a child five years old. Madame de Maintenon, who had at last shown how wearisome was the task she had borne for thirty-two years, and how thankful she was in her old age to be relieved from it, abandoned the king just before his death, and withdrew to St. Cyr. And so passed away a monarch who had certainly been great, though not in the highest sense of that word,—whose soul had been beneath the level of his circumstances. It was with an instinctive movement of relief and pleasure that France heard the tidings of his death. The load of misery he had laid on the shoulders of his people had become too great to bear. He had used them, their strength and the labor of their hands, without stint or regret; but had never done anything to solace their woes, and in the worst and most famine-stricken times the wasteful expenditure of the court remained undiminished, and the cares of the Great Monarch never descended so low as to the poor people, whose fortunes the steady growth of the absolute monarchy had placed entirely in his hands.

A new age begins.

Philip of Orleans regent.

The reaction in France.

For France the 18th century begins with the death of Louis XIV. The party which had surrounded the late king, the party of Madame de Maintenon, the Jesuits, the duke of Maine, represented the past; their opponents were ambitious to represent the future. At their head stood Philip, duke of Orleans, who had in extremest form all the characteristics of the Orleans branch of the Bourbon family,—who was brilliant and most intelligent, highly educated and cultivated; who was brave and capable as a soldier, full of good ideas as to the benevolent management of the people, and lastly, profligate and utterly without rule in his moral life, so that his better side was always neutralized by his worse qualities, and he ended by failing completely in his attempt to govern France on principles opposed to those of Louis XIV. Like so many of the prominent personages of the 18th century, his intellect grasped the future, while his vices clung to the past. Even while the old monarch's remains were being hurried with scanty pomp and tearless eyes to St. Denis, Philip of Orleans swept away all the arrangements of the royal will, and had himself declared regent, with full power to appoint his council of regency. The public opinion, as far as it could exist and express itself, warmly supported this *coup d'état*, and the party of the duke of Maine shrank into utter obscurity. At once the regent set himself to reform the government, and alter the foreign policy of France; in this he was guided partly by his knowledge of the plans of the late duke of Burgundy, and partly by the acute intelligence of his former tutor the Abbé Dubois; the duke of Burgundy represented also the virtuous, the abbé the scandalous, side of the new Government. In home affairs the regent's action aimed at a complete reversal of the late king's methods. He proposed to shift the work of governing from the king to the nobles; there were to be six business councils or boards,—for foreign affairs, army, navy, church affairs (the "council of conscience"), home affairs, and finance. This system of government failed, partly through the indolence of the regent, partly through the inaptness of the nobles for practical business. In church matters, the Jansenists were not unpopular and came back to Paris; Cardinal Noailles, head of the council of conscience, was moderate and tolerant, and the Jesuits felt that their power was much weakened. The regent even talked of inviting back the Huguenots to France; this, however, was beyond his powers. He had Fénelon's *Télémaque* published at last, as a kind of manifesto against the late reign, and a prophecy of the coming era of benevolent princes. He hoped to introduce throughout France the system known as that of the *pays d'états*, a system of local estates or parliaments, which should lead up to a real and substantive States-General, and make all the provinces alike in form of government. This also he could not carry into effect. In foreign affairs Dubois led; his main view was that France and Spain could not be friends, that Philip V. would gladly represent the old high Catholic interference in France, and would do his worst to overthrow the regent, whose character and ideas alike were odious to him. This being so, here was reason for another reversal of the late king's views; France should seek her friends among the natural foes of Spain,—England under the house of Hanover and Holland. The marked Anglomania, the enthusiasm for everything English, which is to be seen at this time in France, worked in well with these new lines of foreign policy. With these views Dubois set himself to resist the bold schemes of Cardinal Alberoni, the adventurer, the would-be regenerator of Spain. In 1717 he succeeded in combining the three countries in opposition to Alberoni, and in 1718, on the emperor acceding to the league, the Quadruple Alliance (France, England, Holland, the empire) was signed. The detection of the Cellamare plot, for the overthrow and assasination of the regent, had enabled Dubois, just before this time, to get rid of all the Spanish party. He deported Cellamare, the Spanish ambassador, and imprisoned the duke of Maine and the leaders of that side; he also took for himself the post of foreign minister. War now began; England crushed the Spanish fleet; the imperialists, in British ships, seized Sicily; Marshal Berwick won some successes in northern Spain. The basis on which Alberoni had built was too slight to bear the strain of unsuccessful war; he fell, and early in 1720 the treaty of London closed this little war. Spain ceased thenceforward to cherish schemes of life and energy; the ancient kingdom lapsed once more into proud decay.

The Quadruple Alliance.

At this very moment France greatly needed some triumph and some tranquillity, for she was now rudely waking from new dreams of gambler wealth at home. The financial difficulties inherited from the late reign had baffled all the skill of the duke of Noailles, who presided over the council of finance. His "chambre ardente," with which he had hoped to cure the evils of the time by punishing and frightening financiers, brought no relief; and the regent, whose active mind and indolent disposition led him to adopt new and brilliant schemes, was carried away by the clever suggestions of John Law of Lauriston, an adventurer, in whose ready brain new ideas as to finance and banking teemed. He had hold of some half-truths respecting the real objects and character of money and commercial circulation.

John Law the financier.

Paper money was a new thing; and Law believed that notes, based on the permanent wealth of the country, the soil, might be made to double the nation's capital, and relieve it of all its embarrassments. He was allowed to establish a bank of his own in 1716. This answered so well that in 1718 Government undertook the whole mystery of banking, with Law as director of the new Royal Bank. In connection with this institution, intended to set afloat paper supported by the property of the state, he started his famous Joint-stock Mississippi Company, with its grant of Louisiana, and all the unknown, and therefore marvellous, wealth and resources of the interior of North America.

The Mississippi Company.

The shares were greedily taken up; the new bank notes seemed to afford an easy and inexhaustible supply of wealth, which would extinguish the debt, and set the country forward in lucrative enterprise. For a few months the fever was amazing; the wildest excesses of stock-jobbing and gambling were committed; on the wings of this paper-wealth the state should escape out of its difficulties, and private persons fly up to splendor. Law himself bought a handful of titled estates, and seemed to become one of the greatest men in France. Early in 1720, however, confidence was shaken, and then the bubble burst. Law stood his ground a while, but at the end of the year he was obliged to take flight, as poor as when he began. The embarrassments of France were not got rid of in this way; the royal bankruptcy which was impending would in the end pull down the monarchy.

Cardinal Dubois.

Dubois, who had prudently kept clear of this downfall, now turned his ambition towards church preferment; on his unworthy head were placed first the archiepiscopal mitre of Cambrai, then the cardinal's hat. His rise made it necessary for him to appease the Jesuits and depress the Jansenists, and this he did without a moment's hesitation. For a year Cardinal Dubois, as first minister, was the foremost man in France. He proclaimed the majority of Louis XV. in 1723; and just as his career of scheming, of clever unprincipled government, seemed crowned with fullest success, a little accident brought him to his grave. Four months later his boon companion the duke of Orleans was carried off by apoplexy. Thus had the long reign of Louis XV. begun with shameless vice and prosperous hypocrisy; as it began, so it continued to the end; and all the time the financial difficulties of the country grew apace. The debt, seed-plot of revolution, soon passed all power of management.

Character of Louis XV.

The young king had some chances given him; he had good preceptors, and intelligent people around his youth. His temperament was, however, entirely bad: the religious element in him was superstition and fear, which led him to mix up piety and debauchery in most ghastly connection; he was coldly selfish, indolent, vicious; the absolutions of his courtly confessors and directors gave him an easy conscience, if he had a conscience at all, and encouraged him to continue his career of shameless immorality, till at last his vices did what religion seemed unwilling to do,—they arrested the scandal of his life by bringing him suddenly and directly to his grave.

The Duke of Bourbon minister.

From 1723 to 1726 the duke of Bourbon, who had been president of the council of regency, was first minister. It is an obscure period, which produced only, through a back-stairs intrigue, the marriage of the young king with Marie Leczinski, daughter of that Stanislas who had been king of Poland, and was to be the last duke of Lorraine, and who rejoiced in the high-sounding title of the "Beneficent Philosopher." In this 18th century princes and great ministers adopted titles and phrases which in our days have descended to the level of the vendors of quack medicines. Still these affectations of princely humanity were a phenomenon of some importance in the period, as showing how the current of feeling and opinion was setting towards those principles of right, that love for mankind, that zeal for good works, which is based on the intrinsic equality of all men. The rule of the brutal duke of Bourbon and his mistress, the Marquise de Prie, came to an end in 1726, and then André Hercule Fleury, bishop of Fréjus, the king's preceptor, took his place. The statesman Fleury, and the church historian, contemporaries, are not the same person. The historian was confessor to Louis XV., the statesman his tutor.

Cardinal Fleury.

André Fleury, now first minister and cardinal, had the credit of being an upright and disinterested man,—Pope calls him "honest Fleury,"—and all society, from the king downwards, thoroughly trusted him. His honesty, however, was narrow and limited, and his home government obscure and uneventful. He made no scandals and attempted no reforms. Against his will and judgment he left his mark on foreign politics, though here, too, his was a "hand-to-mouth" policy, which involved no large view or grasp. At first he succeeded, with no little dexterity, in arresting the war which Austria and Spain, supported by Russia and Prussia, threatened against England and France. The congress of Soissons in 1729 arranged the points at issue, at least for a time.

The north of Europe.

In the north, however, matters were more difficult, for here new elements had entered into the political world. The new ambitions of Russia under Peter the Great, and the consolidation of the young kingdom of Prussia, at once affected the position of Austria, involving that ill-placed state in fresh relations and duties; while the situation of Poland, amidst them all, was obviously threatened. France, of old the friend and always the romantic admirer of Poland, could not fail to be involved in the quick and unstable changes of the chivalric kingdom. This now occurred.

The Polish error.

In 1733, Augustus II. of Poland dying, the electing nobles, instinctively dreading the power of their neighbors, Russia, Prussia, and Austria, who had made a secret compact together as to Polish affairs in 1732, appealed for French help, and re-elected Stanislas Leczinski their king; he had been the nominee of Charles XII. in 1704, and had fallen with him. The Russian party among the nobles elected Augustus III. of Saxony, and as Austrian and Russian soldiers supported him, while France, in fact, did nothing but declare war against Austria, he seated himself firmly upon the throne of Poland. French influence for the time was utterly defeated, and Stanislas, after suitable romantic adventures, found refuge in France. The war with Austria, which began late in 1733, in 1734 occupied the last energies of the last of the old generals of Louis XIV. Marshal Berwick, commanding across the Rhine, was killed in the trenches before Philipsburg; and Villars, in Italy, after one brief campaign, in which he was thwarted by the duke of Savoy, died at Turin about the same time. The French fought well in this Italian war; they won a hotly-contested victory near Parma, lost a sharp affair at La Secchia, and defeated the Austrians at Guastalla. The Spaniards, taking advantage of the weakening of Austria in south Italy, landed Don Carlos at Naples, where he was warmly welcomed, and the "Two Sicilies" passed from Austria to the Spanish Bourbons. The French having taken Philipsburg were in a commanding position on the Rhine, while the Austrians were much weakened in Italy. The emperor therefore made proposals for peace, which pacific Fleury gladly met. The treaty of Vienna (3d October, 1735) seemed to secure French influence in central Europe; the Two Sicilies were made a kingdom for Don Carlos; Lorraine and ducal Bar were given to Stanislas Leczinski, who abandoned all claims on Poland, and at his death the duchies were to fall in to France; the duke of Lorraine was made heir of Tuscany, and succeeded to that government in 1737; France undertook to guarantee the Pragmatic Sanction of Charles VI. Charles VI., under whom the house of Austria daily grew weaker, was daily more eager for the flimsy security of this famous document, which aimed at ensuring the undisputed succession of his daughter Maria Theresa to all his possessions, as head of the house of Austria. Fleury, by acceding to this paper-guarantee, became all powerful with him, and induced the emperor to sign the peace of Belgrade (1739), by which the possession of that important city passed to Turkey. In these years Fleury's policy seemed thoroughly successful, and France was believed to be prosperous. Her prosperity, however, did not reach her people; the misery of the peasantry in 1738–1740 was exceedingly great; famine came each winter; the people died in crowds. D'Argenson in his *Mémoires* declares that "more Frenchmen died of misery in these two years than perished in all the wars of Louis XIV."

The Pragmatic Sanction of Charles VI.

The first Silesian war.

In 1740 died both the emperor Charles VI. and Frederick William, king of Prussia; the strength of the Pragmatic Sanction had now to be brought to the test. Charles VI. left no male issue, and his daughter Maria Theresa, married to a weak prince, Joseph of Lorraine and Tuscany, was his sole heir. To the throne of Prussia succeeded Frederick II., a slight and ingenious prince, who admired the French and played on the flute. He reigned for forty-six years, and was Frederick the Great. Instantly there was a scramble for the great and widespread lands thus left to a woman's care. Joseph of Lorraine failed to get the imperial crown; this, however, was a little matter, and after all it came to him in 1745. For the territories there were several claimants: Bavaria, Spain, and Saxony, all asserted their claims to the whole inheritance; the king of Sardinia wanted some Italian fiefs; the young king of Prussia laid hands on Silesia. France obviously lay outside the quarrel; yet it was hard to think, with Fleury, that a peaceful and reserved position was her best policy. A war-party, headed by the two Belle-Isles, Fouquet's grandsons, negotiators and soldiers, rose up at court in opposition to the old minister. All Europe ranged itself for or against the fair young queen of Hungary. England was warmly for Austria; France, late her ally, now hoped finally to effect the partition of the territories of the house of Hapsburg, and joined Prussia; Spain followed on the same side, being already at war with England; the elector of Bavaria and other German princes, Poland also and Sardinia, were on the same side. At first Maria Theresa seemed to have no friends save England and Russia. The first Silesian war had already begun by the swift seizure of Silesia itself by Frederick. The French plan was to repeat the German campaigns of the Spanish Succession War,—with Bavaria as an ally to cross into the Danube valley, and having taken the outworks of Austria, to threaten Vienna, and drive the queen to submission. The French army was led by Belle-Isle, who was made marshal for the occasion. It crossed the Rhine, pushed down the Danube, took Linz and Passau, and seemed to carry out its plan in full. Maria Theresa took refuge in Hungary; the elector of Bavaria had himself proclaimed archduke of Austria, and then, supported by French help, marched into Bohemia, and took Prague, the capital. He was now crowned king of Bohemia, and soon afterwards elected emperor (1742). Belle-Isle's schemes seemed all to succeed. Time, however, had told on the struggle; Russia began to intervene; England and Holland sent help to Maria Theresa; Prussia, securing the main part of Silesia, made peace with the queen of Hungary; and the French by the autumn of 1742 were left alone in Bohemia, face to face with the revived strength and spirit of the tenacious house of Austria. In mid-winter Belle-Isle was compelled to retreat from Prague, and after terrible sufferings and losses, brought his army back to the Rhine. In this campaign the one great general of the age, Maurice of Saxony, whom the French henceforth called Marshal Saxe, distinguished himself greatly. Early in 1743 the aged Fleury, whose last days had been embittered by the war and by its failure, died in his ninetieth year. Henceforward, Louis XV. had no one at his side to save him from the disasters of mistress-government, of which the malign influences grew yearly stronger. The war in 1743 again followed the ideas of Marlborough. The English and Germans hoped to command middle Germany, to capture or eject Charles VII. at Frankfort, and then to catch the French in Bavaria. With this view George II. and the allies pushed forward hastily to the Main, and, but for the equal rashness of the duke of Grammont, would have been intercepted and ruined by the French army. As it was, George II. won the battle of Dettingen, which in England was celebrated by Handel's famous *Te Deum*, and in France aroused vast merriment; for defeat in the 18th century meant the discrediting of the noble officers. The Parisians called the battle the "Journée des bâtons rompus,"—the day on which the marshals' batons were not won by D'Harcourt and Grammont. The French armies of Bavaria and the Rhine fell back into Alsace, and Charles VII., seeing how little help they could give, made peace with Maria Theresa. Her fortunes and hopes had risen vastly; she thought she saw her way to the recovery of Silesia from Prussia,—the recovery of Alsace and Lorraine from France. In 1744 war, which had slackened, renewed its force.

The second Silesian war.

A new league of Frankfort brought Frederick of Prussia again into the field. France undertook to reduce the Netherlands, and to check England by landing Charles Edward, the "Young Pretender," in Scotland. This part of the scheme failed completely. In the Netherlands the genius of Marshal Saxe accomplished all France desired; the barrier-towns had been neglected, and fell one after another. The ill-success of their army in Germany, and the vigorous attack of Prince Charles of Lorraine on Alsace, compelled the French to suspend operations in the Netherlands, in order to strengthen Coigny, who commanded on the Rhine. Their want of power spoiled Frederick's campaign in Bohemia; Charles of Lorraine returning thither forced him to withdraw into Saxony. In 1745, in spite of Frederick's wishes, the war on the French side returned to the Netherlands, and there, on the 10th May, the French army won its one decisive victory of the period, defeating the Anglo-German and Dutch forces under the duke of Cumberland at Fontenoy. Louis XV. was present in this action, and showed no lack of fire and bravery. This victory was decisive for the campaign; the Netherland towns fell fast. In Italy also the battle of Bassignano laid Lombardy at the feet of the French. On the other side Frederick the Great, though he still won great victories, felt that Maria Theresa was growing stronger. Her husband's ambition was gratified with the imperial crown; and at the very end of the year she consented to make peace, ceding Silesia to her vigorous rival, and securing the universal recognition of her spouse as emperor. The peace of Dresden (Christmas, 1745) closed the second Silesian war.

The peace of Dresden.

France was now almost isolated; her successes in the late year seemed of little avail to her; the attempt of Charles Edward on Scotland was crushed (April, 1746) by the duke of Cumberland at the battle of Culloden; and the English sea-power began to show its vigor. Off the French and Spanish coasts England gave her foes no rest; in India she recovered Madras, which had fallen into Dupleix's hands, and spoiled the French plans for ascendency in the East. In this year, too, the French armies were very unfortunate in Italy, and lost all their command of the peninsula. The Netherlands campaign, guided by Marshal Saxe, alone sustained the honor of the French arms; Belgium fell completely into their hands. In 1747 Marshal Saxe, though he took Bergen-op-Zoom, failed before Maestricht; and France seemed as far as ever from being able to coerce Holland. In the following year the siege of Maestricht was resumed, but negotiations for peace intervened, and the great fortress was not reduced. The peace of Aix-la-Chapelle, of which the preliminaries had been signed in April, was finally

1748-1754.

The peace of Aix-la-Chapelle.

concluded in October, 1748. It greatly discredited France; the successes of her arms in Belgium, Savoy, and Nice, were of no avail against the strength her antagonists had developed. England and France mutually restored their conquests,—France receiving back Cape Breton and England Madras; the frontier fortresses, chief prizes of the late war, were handed back to Holland. France agreed to remove Charles Edward from within her borders, and guaranteed the succession of the house of Hanover. Silesia was secured to Frederick; the Pragmatic Sanction, in all other points, was once more accepted by Europe; the house of Austria also ceded Parma and Piacenza to the Spanish Don Philip. With this peace closes the long rivalry between France and Austria; when war breaks out again they will be allies.

Madame de Pompadour.

"To the government of an old priest succeeded that of a young mistress," says Michelet; for this was the time in which Madame de Pompadour rose to power. Her authority lasted twenty years,—the twenty years in which France sank rapidly in Europe into weakness and discredit, while her great writers were awaking all the dormant echoes of the world, and summoning together the forces which brought on the Revolution. The mistress made and unmade ministers at will, and changed the whole face of the foreign policy of France; the scandals of the court under her rule set men listening to the new ideas which spread swiftly through France; the more the noblesse descended in worth and strength, the more its younger members talked the language of modern humanity. Almost all, like the state, were more or less bankrupt, and unable by character, training, circumstances, to take advantage of the movement of society around them. When France awoke she scattered them to the winds.

The unsettled condition of Europe.

Europe was very far from being finally pacified by the peace of Aix-la-Chapelle; on the contrary, every one seemed to see rents and holes in it through which he might win new advantages. Frederick the Great was no doubt content with it, and so was England; others, however, were far from such feelings. Maria Theresa had reluctantly set her hand to the cession of Silesia, and scanned the horizon for help to enable her to recover that important duchy.

Rivalry of England and France.

France was almost as uneasy, for England had gained advantages which were in fact her losses; and she, too, hoped ere long to reverse the decisions of the treaty. In India her prospects seemed bright, under the brilliant leadership of Dupleix; in North America the peace had left very serious matters still unsettled, and it was hardly likely that any court save that of the sword could decide the difficult questions still open,—questions as to the limits of the Acadia which had been ceded to England; vital questions as to the connection between Canada and Louisiana, both still French territories; questions as to the islands off the coasts of America, the ownership and possession of which had been left undetermined. Acadia had been ceded without any definite statement as to whether the cession carried any portion of the mainland as well as the peninsula of Nova Scotia; and England claimed the territory as far as the shore of the St. Lawrence river. This was a smaller matter; the question as to the relation between Canada and Louisiana involved no less than the ultimate possession of all North America. For while England held the coast, and hoped to combine the wealth of agriculture with that of commerce, she had always behind her the long line of French possessions and claims, which interfered with her colonizing development, and threatened to push her back to the sea. For France had the Canadian lakes, the valley of the Ohio, and that of the Mississippi; she had communication with the sea on the north at the estuary of the St. Lawrence, on the south in the Gulf of Mexico. Were she to secure the connection through this long line, the English colonies would be terribly straitened and endangered; the French forts along the Ohio seemed a perpetual menace to English interests. Consequently the doors were scarcely shut on the negotiators at Aix-la-Chapelle, when fresh discussions began to spring up, and conferences were held, in a more or less angry tone, at Paris. In 1754 England, thinking that France was only lengthening out the dispute because she hoped to strengthen her navy for a fresh struggle, suddenly made war, without a proper declaration, and fell on French ships and forts whenever she could capture them. It was a high-handed and offensive proceeding. In India also an undeclared war was going on between the officers and forces of the East India Company and the French under Dupleix, which brought out the latent power of that young civilian, Clive, and ended in 1754 in the recall of Dupleix, and in a peace, or at least a cessation of warfare, between the rivals on the Indian shores. It was quite plain that before long this state of half-warfare must develop into a more serious struggle. To that also the whole movement of European politics speedily began to tend. For it was not only at Paris and London that negotiators were busy in these years; the Austrian court, eager for revenge on Prussia, and led by a strong and dangerous statesman, Kaunitz, was looking hither and thither for new alliances. The world had grown weary of the old lines of opinion, the old rules of policy, the old relations of courts. Kaunitz deemed himself the chosen instrument of a new departure, which would rearrange the map of Europe, and restore its proper authority to Austria and the empire. This statesman, father of modern diplomacy, and more especially of that side of it which has ever since been cultivated at Vienna, had administered the Austrian Netherlands in the last years of the late war, and had represented Austria at the congresses of 1748. In 1750 he was sent as ambassador to Versailles, and, as he watched the manners and temper of French society, persuaded himself that he saw his way to new combinations which might be very profitable for his mistress. The experience of Aix-la-Chapelle had convinced him that England was not trustworthy when her interests clashed with those of Austria. He saw how his country had suffered by the peace; it seemed to him that France would be a far better ally than England. Hitherto France had steadily played the part of friend and protector of the smaller North-German states, in their struggle against the dominance of the house of Austria,—this was a natural and necessary result of the secular rivalry against the Austro-Spanish power. Now, however, Prussia had taken up the post of champion of North-German interests and opinions; whereas France, by her new Bourbon relations in Spain, and her support of the Jacobites against the Hanoverians in England, had entirely changed her ground. She was far more likely to find a cordial friend in south than in north Germany; she had nothing to fear from Austria; she had much to lose or gain in the north; the Hanoverian interests of the reigning dynasty in England led the Guelfs to oppose the advance of France on the Rhine; the jealousies on other sides between France and England all tended in the same direction,—the direction of compelling France to look for new friends, and to abandon her ancient policy. Prussia became the inevitable ally of England; France began to look towards Austria. The disagreements between Austria and Holland as to the barrier-towns in the Belgian country naturally threw the sea-powers together; for neither Holland nor England cared to see Austria on that side, or to find a new rival rising up at Antwerp. Now, all political alliances are based rather on interest than on sentiment; and when it grew tolerably clear that the interests of England and France and those of England and Austria had become widely divergent, it became equally clear that new combinations must come. Austria was altogether implacable towards Prussia; England, or rather the English court, in its anxiety for Hanover, felt that Prussia could be no rival, and might be a good friend. Prussia was not a sea-power, and was a very near neighbor to Hanover. And so, when Kaunitz tried to persuade the English cabinet that it ought to join Austria in a war for the recovery of Silesia, he found so cool a reception that he at once turned elsewhere. His knowledge of France taught him how to succeed there; it must be by appeasing and interesting Madame de Pompadour; and the king of Prussia had lately offended not only her but her parasite the Abbé Bernis by his unpleasant trick of plain speaking; and the political independence of late years asserted for Prussia was also highly distasteful at Versailles. He knew that if he could overcome the reluctance of Louis XV., who clung to the older ideas of French policy, and persuade him also that Austria could be a good friend against England, he might succeed in reversing the political conditions of Europe, and perhaps win Silesia back for his mistress. He easily persuaded Madame de Pompadour; her influence was his from 1751; but the king was slow to move. Not till 1755, when the insults of England to the flag of France were too great to be borne,

1754-1755.

France and Austria.

Changes in European policy.

did he determine to accept the good offices of Kaunitz, and to threaten Hanover. England at once drew towards Prussia, Hanover being the bond of union between them. While the two Catholic powers formed their alliance together, and Madame de Pompadour, as men noticed with a smile, showed quite a fervor of devotion which seemed not in the least incompatible with her moral position, the two Protestant powers, England and Prussia, set themselves to resist the Catholic movement, and, if possible, to secure the triumph of toleration in northern Europe. In this France undertook an ultra-conservative line of policy, in union with her old antagonist; she ceased to lead, or even to sympathize with, the advancing states of Europe; it was the old world she would support, the new order of things could no longer count on her. And, besides all this abandonment of traditional policy, in itself no little risk, the new alliance made with Austria was, on the face of it, a political blunder; there was nothing to be gained by it, and much to be lost. For the essential points to which the whole care of France should have been given were across the sea, in Canada and in India; and here she was allying herself with the most inland of European powers, excepting Poland, which could scarcely be reckoned as a power at all, and bending all her energies to attack England by a march across north-western Germany into Hanover; hither went her strength, while the English were left to carry out unmolested the plans on which their future greatness hung. Had the new coalition been successful, Austria would doubtless have crushed Prussia, but what advantages could France have reaped from the war? Her position in it was that of quite an inferior and secondary power; the contest would exhaust her already diminished strength, and teach the world how low she had fallen; and if she failed, it would be little less than ruin to her. England, however, having (early in 1756) signed a treaty of neutrality with Prussia, France delayed no longer. On Mayday, 1756, the "Alliance des trois Cotillons," "of the three petticoats," as it was styled, the coalition of Madame de Pompadour with Maria Theresa and Elizabeth empress of Russia, was formally undertaken, to the vast delight of the French court and nobles, which longed for the pleasures of a great military promenade in such good society, assuming that the French people would, as usual, bear the cost, and leave to them the excitement and the glory. It did not turn out so amusing as they had expected. This treaty of Versailles was immediately followed by a declaration of war on the part of England; and Pitt before very long had smoothed over all difficulties which lay in the way of an offensive and defensive alliance with Prussia. The elder Pitt was regarded with as much fear and hatred by the court of Madame de Pompadour as the younger Pitt was by the republicans forty years later in the days of the Terror. The allies were chiefly tied by circumstances and mutual convenience to occupy different portions of the field of war,—England grappling with France, and Prussia with the Austrians.

The "Alliance des trois Cotillons."

The Seven Years' War.

At the beginning the French navy had no small share of success. During the peace great attention had been paid to it, and the growing importance of her commerce had reared for France no despicable school of mariners. At the outset of the war a great expedition commanded by Marshal Richelieu, who has the bad distinction of having done more than any other man to debauch and corrupt that apt pupil the king, set sail from Toulon harbor, and directed its course for Minorca, which was occupied by the English in force. Richelieu took Port Mahon and invested St. Philippe, on which the English had expended vast toil, hoping to make of it a second Gibraltar,—a second point of influence in the Mediterranean. A relieving force of seventeen ships, commanded by Admiral Byng, son of the first Lord Torrington, was handled so ill that it was defeated and driven off by the French fleet under La Galissonnière, and shortly afterwards the fort of St. Philippe was carried by assault in a very brilliant manner by Richelieu. With it the French became masters of Minorca, and Richelieu returned in glory to Paris. Very different was the reception of Byng in England. There the news of the fall of Minorca had created terrible excitement; the ministry fell, and Pitt took the reins of power in his hands. He and the old Whigs at his back were known to be anxious for vigorous measures, and for a hearty co-operation with Prussia. Byng was sacrificed to the resentment of the people; his incapacity and vacillation in the presence of the enemy were regarded as signs of treason, and he was shot as a traitor. The war, thus favorably begun by France, ought to have been carried on by the same lines; her chief strength should have been directed to the sea. If fortune favored her still in the maritime struggle, she might fairly have hoped to win her cause in Canada and India. But the unlucky likings of Madame de Pompadour for Kaunitz and the Austrian alliance threw the country off its right course, and embarked it on a harassing and perilous Continental struggle. At first, though Spain, Poland, and Holland remained neutral, almost all the rest of Europe,—Russia, the elector of Saxony, the German diet, and Sweden,—declared for Austria; and after that Frederick's sudden invasion of Saxony in autumn, 1756, showed that the war was really begun, Louis XV. in January, 1757, declared war on him, and openly joined the league for his destruction. Hesse and Brunswick alone supported Frederick. For this France willingly abandoned her success on the sea. She had seen Pitt's first effort, the attack on Rochefort, fail ignominiously; she had driven off another fleet which threatened St. Malo and Havre; she had news of successes in both Canada and India; still, rather than make these omens of fortune her own, she turned aside to invade Hanover, and plunged into the larger war, in which she could never hope to win any real profit for herself. While Frederick was attempting in vain to crush the Austrians by reducing Bohemia, whence he was obliged to retreat after the disastrous battle of Kolin (18th June, 1757), the French army, 80,000 strong, and commanded by Marshal D'Estrées, crossed the Rhine, and directed its course towards the Weser. The English and their allies were commanded by the victor of Culloden, the unwieldy duke of Cumberland, who posted them behind the Weser at Hastenbeck; here D'Estrées overtook and defeated him (26th July, 1757). The victory was, however, not complete enough to please the French court, with whom D'Estrées was not popular. He was removed, and the duke of Richelieu taking his place pushed the English before him to the Elbe; at Stade the duke of Cumberland was compelled to surrender his army, and to sign the shameful convention of Kloster-Zeven (8th Sept., 1757), which permitted the defeated Germans to return home. Home also went the duke of Cumberland, shorn of his honors as the savior of the Hanoverian cause; him, however, the English did not shoot, as they had shot poor Byng. Marshal Richelieu having thus disposed of his antagonists, deemed that his work was done; it only remained for him to make the most of his conquest in the way of pillage; so instead of marching on Brandenburg, which was almost bare of troops, he contented himself with extorting a fine fortune from the Westphalians and Hanoverians, with which he built himself a splendid palace at Paris, the Pavilion de Hanovre. This was but a poor result, considering that it was believed that, had he pushed forward, he might have brought the war to an end in one campaign. His selfish indifference to the duties of high generalship wrought the ruin of his cause. While he lingered in Westphalia, the English began to recover from their panic; and Frederick, returning with incredible swiftness out of Saxony, arrested the course of disaster. The French army under Richelieu had been told off to overcome the Anglo-Hanoverian resistance; another army, under the prince of Soubise and the duke of Saxe-Hildburghausen, who commanded the troops of the German circles, was slowly moving towards Berlin, hoping to co-operate with Richelieu's victorious forces. Their progress, however, was rudely interrupted at Rosbach, on the 5th of November, 1757, by Frederick, who caught and utterly ruined them in a battle which cost him almost nothing, and was over in an hour and a half. Rosbach was one of the decisive battles of the world, little as it has been thought of by history. Perhaps it has never happened, before or since, that so hollow and slight a contest has produced such great results. At first it seemed like a mere comedy; the crowd of French captive regiments, the spoils of the camp, the bewilderment of the captors, the "host of cooks and players, of wigmakers and wigs and hairdressers, the parasols and cases of lavender water," the absurdly incongruous lumber with which the young French nobles had prepared for war, contrasted strangely with the gaunt and tattered soldiers of Frederick the Great, grim with war, privations, and forced marches.

The French in Germany.

The battle of Rosbach.

A shout of merriment rang through Germany, and was re-echoed from France herself. The light-hearted French were far from being depressed or vexed by the defeat; in the middle of the 18th century France was utterly indifferent as to glory, and the country saw in Dettingen and Rosbach not its own defeat, but the discomfiture of the frivolous noblesse; to the temper of the times these glaring instances of noble incapacity were rather pleasant than not. The effects of the battle on England were also very marked. It was there seen that Frederick's cause was not hopeless; and the English Government at once refused to be bound by the convention of Kloster-Zeven, appointing as commander-in-chief, in place of the duke of Cumberland, the vigorous and able Ferdinand, duke of Brunswick, one of the best soldiers of the age, who won and thoroughly deserved the respect and confidence even of Frederick the Great. Hitherto England had sent over nothing but money and the duke; now Pitt undertook to bring 20,000 Englishmen into the field, and henceforth England holds a principal place in the French side of the Seven Years' War. The greatest, however, of the results of the battle of Rosbach was its effect on public and national feeling in north Germany. Hitherto all men of cultivation and thought had turned to France for inspiration; all men of taste and fashion regarded France as the arbiter of their destinies in dress and manners; the French language was alone polite in courts and good society; the German tongue was counted rude and barbarous; Frederick the Great himself, the very champion of Germany against France, of modern freedom of thought against his Catholic opponents, the odd "Protestantium Defensor" of his medals, could never bring himself to speak or write German if it could be avoided. But after Rosbach the older fashion passed away; French manners, which before had seemed so beautiful, were now seen to be corrupt and frivolous; the slower Germans saw that their own manners and tongue were worth something; from the battle of Rosbach begins that upspringing of a national life in north Germany, which finds immediate expression in the splendid new-born literature of the day, of which the most direct and marked example is the *Minna von Barnhelm* of Lessing. In this way, then, the battle of Rosbach is an epoch in the national history of Europe. It restored the fortunes of Frederick the Great, and roused a new sense of national patriotism in the North-German peoples.

After 1757 the Seven Years' War may be considered as having two chief theatres,—that of Frederick against Austria, and that of England with Hanover and Brunswick against France and the lesser German princes, the "army of the circles." It is with the latter only that we have to do.

The campaign of 1758.

In 1758 France made great efforts to reorganize her armies, and fit them for decisive action in Low Germany. A new commander-in-chief, the count of Clermont, a weak offshoot of the great house of Condé, replaced Richelieu; Soubise, whose favor at court endured to the end of the reign of Louis XV., and who was the only courtier who ventured to escort that monarch's remains to the grave, was placed at the head of a new army. Under these two generals the court hoped to achieve good results in this campaign. The two main armies were directed, the one towards the Rhine, the other towards the Weser; that of the Rhine, under Clermont, had the strong position of Wesel, now in French hands, as a base of operation, and proposed to push on thence into Hanover, joining the other army under Soubise, which was to advance along the Weser through the Hessian country. Before, however, they could draw their scattered forces together, the new general of the allies, Ferdinand of Brunswick, was on them, and in a campaign which Frederick the Great did not hesitate to compare with that of Turenne in Alsace, he succeeded in dislodging Clermont from Brunswick. He speedily cleared the line of the Weser, recovering Minden, and driving the French under Clermont to the westward. They made no stand, and when they reached the Rhine at Düsseldorf, succeeded in crossing the river only with heavy loss of prisoners,—for Ferdinand stuck to their skirts like an avenging fury, and at last caught them at Crefeld, a little town between the Rhine and the Meuse, not far from Düsseldorf, where he inflicted on them a defeat which covered Clermont with discredit, and utterly ruined the prospects of the campaign. The Germans had now driven the French out of Hanover, Brunswick, and the Rhine provinces; Clermont was recalled, and withdrew into private life. He and his antagonist Ferdinand were both freemasons, and both had sympathies with the philosophical and political ferment of the age; yet the masonic brotherhood had not hindered Ferdinand from punishing him very severely in this campaign. Marshal Contades, a really good general, was sent to take command of the beaten forces; and Soubise, having won the battle of Sondershausen, and having taken Cassel, threatened Ferdinand's rear, while a reorganized army under Contades endangered his communications on the Rhine; they were twice as numerous as the forces he could bring against them, and he was obliged to draw back on Münster, giving up the whole left bank of the Rhine. There he hindered the junction of the two French armies, and compelled Contades to retreat again beyond the Rhine; while Soubise withdrew to the Maine, and lay for the winter about Frankfort and Hanau. So ended the German campaign of 1758, into which the French Government had thrown all its strength, and had once more got in return nothing but discredit, while the other interests of the country had been left to drift to ruin. The English fleets harassed the coasts of France, destroyed ships, burnt building-yards, took Cherbourg, and paralyzed her whole naval force. Abroad, she did nothing for the vital contests her sons were waging; the English took Senegal on one hand, and, in spite of the ability of Montcalm, mastered Louisburg, and Fort Du Quesne on the Ohio, which they renamed Pittsburg. At the same time the struggle in India, which had begun to turn against France, was restored by the brilliant courage of an Irish Jacobite, Lally, whom the French court named governor general. On his arrival he at once effected wonders, recovering the ground the French had lost; he vaunted that no Englishman should be left in the Peninsula. But Lally, brave and brilliant as he was, was also harsh and impetuous, arousing ill-will even by his good qualities. Nothing offended his subordinates so much as his refusal to allow them to pillage at will; and the bright opening of his career in India was very soon clouded over by disputes and insubordination among his officers, which foretold a coming failure.

Affairs in India.

The mishaps of 1758 on every side at last awoke the Abbé Bernis from his dreams of security and glory, and that obsequious churchman, the henchman of Pompadour, in his cowardly alarm, instead of trying to repair the evil done, withdrew to his bishopric of Aix, giving place to an abler statesman, the duke of Choiseul, one of the most unfortunate of the noble ministers who have ever presided over the affairs of France. His first act was the signature of a second treaty of Versailles, in which he and Madame de Pompadour committed France to terms which plainly meant that France should bear the chief burdens of the war, while Austria should win all the fruit. For she promised to keep 100,000 men on foot, to support the whole Swedish contingent, to restore the elector of Saxony, to defend the Austrian Netherlands, and to support the candidature of Joseph, eldest son of Maria Theresa, for the title of Rex Romanorum, and the succession to his father in the empire, and finally to make no peace with England till Prussia had restored Silesia to Austria. With this amazing treaty France again went stupidly down into the contest, as an ox to the shambles.

The duke of Choiseul.

The campaign of 1759.

In 1759 the old blunders were again repeated; all was abandoned for the sake of the German campaigns; the Rhine army under Contades lay in the Cleves country; the Maine army near Frankfort was commanded by the duke of Broglie, who had already given sufficient proof of his incompetence at Rosbach. Between these armies, watching both, and purposing to hinder their junction, and, if he could, to beat them in detail, lay Ferdinand of Brunswick, now reinforced with twelve thousand English and Scottish soldiers, who had joined him in the last autumn. He thought himself strong enough to attack Broglie, but was repulsed with loss at the battle of Bergen on the Nidda, a few miles from Frankfort; and Broglie, made a marshal for this success, succeeded in effecting a junction with Contades at Giessen; thence they advanced together to the Weser, occupying one place after another. At Minden they paused before pushing on to overrun Hanover, while Ferdinand, having gathered all his forces together, came down to observe and check them. Difference arose between Contades and Broglie; the latter was successful popular, incapable; the former a good officer, whom the fatality which had beset the French court since the later days of

Louis XIV. had thrown into the cold shade; the two were hardly likely to work well together. Ferdinand took advantage of their errors, and (1st August, 1759) with much smaller numbers and the worse position, ventured on a great battle at Minden. The English regiments of foot, with unheard-of audacity, charged and overthrew the French cavalry, which, with amazing ineptitude, had been placed in the centre, as if it were the most solid part of the army. Had Lord George Sackville, who commanded the English horse, done his duty also, the whole French army might have been destroyed or made prisoners. As it was, the exploit of the "Minden regiments" rang through Europe; and the French army, hastily evacuating its positions, fell back to the Maine. Contades, the good general, was of course punished; Broglie remained in command. Later on, he showed his gratitude to the Bourbons by opposing the Revolution as an émigré. Henceforward Ferdinand was able to hold his own in western Germany, and England felt secure for Hanover. The French went on placing huge armies in the field for the rest of the war; yet thanks to "the most perfect incapacity," as Napoleon once said, of Broglie and Soubise, this great force achieved nothing, and succeeded only in still further discrediting the noblesse and the monarchy, while it exhausted with fearful speed the resources of the country.

The battle of Minden.

The disasters of France.

Nor did France pay the price here only; her efforts in Germany still hindered her from attending to her interests elsewhere; the disasters of her navy went on; her influence in Canada and India declined day by day. An attempt to invade England in 1759 failed completely; the battle of Quiberon Bay, and the cowardice of Conflans who commanded there, ruined the French navy; a squadron sent out to harass the coasts of Scotland and northern England, under Thurot, a real sailor, was attacked early in 1760 by a stronger force; Thurot was killed, the squadron captured, and so the French naval power came to an end. Henceforward, no help could pass from France to the outlying scenes of conflict. Point by point the English had advanced in Canada, until (September 13, 1759) the battle of Quebec, which proved fatal to both Wolfe and the brave Montcalm, finally decided the destinies of North America. That victory gave to England the ascendency over Canada, and secured to the sons of the Puritans the eventual mastery over the rest of that great continent. The fall of Montreal in 1760 was the close of the struggle. In India also French affairs had gone very ill in these days; the quarrel between Lally and Admiral d'Aché increased in bitterness; the English finally captured even Pondicherry, the last remaining stronghold of the French in India. This year 1759 is, on the whole, the most disastrous in all the annals of France; it proclaimed with a clear voice to all who would hear that the days of the ancient monarchy were numbered. The monarchy could not defend France abroad, it was dying of debt and corruption at home. It was little help to France that in 1760 the unhappy Lally, whom men in their vexation accused of treason, was brought home, tried, and shamefully executed at Paris. It was not on him that the eventual punishment would fall; in 1778 the generous voice of Voltaire made France confess her injustice, and restore to honor the name of the unfortunate and brilliant Irishman. His son Lally-Tollendal gave to the fallen monarchy a loyalty and support it surely little deserved from him.

Changes now began which pointed towards peace. The accession of George III. shook the power of Pitt; in France the subtle address of Choiseul had carried all before him, and he at last saw his way, too late, to reverse the direction which the efforts of France had hitherto taken. The war in Germany, always a blunder, should become of secondary importance; the active friendship of Spain and other Bourbon princes should restore something of the old sea-power of France. The king of Spain had also found out his folly in remaining neutral, while England grew to be supreme on the water; and consequently in 1761 the famous "Family Compact," the Bourbon league, was signed by all the sovereigns of the house of Bourbon. By it they made alliance offensive and defensive, guaranteeing the territories of one another, promising to support each other and to make no separate peace or war, throwing open reciprocally all their harbors and frontiers, and declaring that for war or peace, for trade or pleasure, France, Spain, Naples and Sicily, Parma and Piacenza, should count as but one country, one land blessed by Bourbons, and led by their great chief Louis XV. Here was a splendid scheme for the reconstruction of European politics! It was the Latin races clasped together by the Bourbon family, and determined to reassert their importance in Europe. Had the family compact been signed three years earlier, or had there been one man of real power among the Bourbons, its result might have been serious for the rest of the world; as it was, the chief effect of it was the resignation of Pitt, and the half burlesque ministry of Lord Bute. For Pitt got some inkling of this secret compact, and, confirmed in his suspicions by the equivocal language of the Spanish court, urged on his colleagues the necessity of declaring instant war on Spain, so as to crush her fleets before France could come to her help. But George III. would none of it; the ministers refused to take the bold step, not having the justification for it in their hands; and Pitt threw up the seals of office. When the compact became known to the world in 1762, England justified Pitt's foresight by at once declaring war; in a few months the Spanish navy had ceased to exist, and France lost her West-Indian Islands one after another. Bute with the young king stood aghast at the series of brilliant triumphs which signalized their efforts to bring war to an end. Meanwhile the French armies in Germany continued an inglorious if not any longer a disastrous career. In 1760, 1761, 1762, they still occupied Hesse and the Rhine country, fighting a few battles with varying success, and displaying in the clearest light the incapacity of their leaders. Negotiations for peace went on through 1762 between France and England, and before the year ended the preliminaries of peace had been signed, just in time to save Soubise with his 80,000 men from being ignominiously driven out of Hesse-Cassel. Frederick the Great, thus abandoned by George III., was also ready for peace. In February, 1763, the two treaties of Paris between France and England, Spain and Portugal, and of Hubertsburg, between Prussia and Austria with Saxony were signed, and closed the Seven Years' War. To French historians it had seemed, as Michelet ventures to call it, "an ignoble war;" a record of blunders and follies, met by shouts of derision at home; for the French people were, at the time, as much amused with the downfall of their incapable nobility as if they had belonged to a totally different race. It was as if they wished to say to Europe that these defeats and scandals were not the defeat of the French people, but of an intrusive clique of strangers; it was also as if the inextinguishable gayety of the nation could find even the ruin of the country comical. Doubtless, in more or less unconscious fashion, France felt that the war had brought the domination of the Bourbon monarchy and its noble flatterers nearer to an end.

The Family Compact.

Close of the Seven Years' War.

The peace of Hubertsburg.

The peace of Paris.

A summary of the stipulations of the peace of Paris shows at a glance how low France had fallen, how futile had been the Family Compact. She ceded all her claims to Nova Scotia, Canada, Cape Breton, reserving only her fishing rights and some small islands useful for that industry; she ceded all the territory which lay between the English settlements along the Atlantic and the line of the river Mississippi; she ceded the islands of Grenada, Saint Vincent, Dominique, Tobago. She received back Pondicherry, and a certain district on the east coast of India; she gave up Minorca, the one flower she had plucked in all the war, to England, and withdrew all her troops out of Germany. England came out chief gainer from the war; her development in these years was immense. To this time we owe the maritime supremacy of this country, and the spread of the English language and race to every shore. We have good reason to be proud of it, and to read with kindling eye the chronicle of our incessant advances. Yet it has, too, its dark side: a world filled with pushing Englishmen could scarcely be a paradise; there are races which object to being thrust aside; there are civilizations which English commonplace cannot supersede; the dull self-satisfaction of ordinary "Anglo-Saxonism" is at least as offensive as the livelier "Chauvinisme" of our neighbors.

The state of France.

In the eleven uneventful years which form the remainder of Louis XV.'s reign the characteristics of the 18th century displayed themselves with clearness, and we shall do well to pass them briefly in review. In them we shall recognize at once most of the germs of those movements of the Revolution-era, towards

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which affairs in France had long been tending.

The court.

To begin at the top;—the court was so corrupt that we must go to the history of the most Oriental despots for a parallel. The king, coldly dissolute, idle, careless as to everything except his scandalous pleasures, and the direction of foreign affairs, which he kept in his own hands, shut himself up at Versailles, leaving Madame de Pompadour to manage everything, even the details of his own debaucheries; the infamous Parc aux Cerfs spread shame and misery among hundreds of families, and added heavily to the financial difficulties of the time. No member of the royal family was of any mark; the pious queen lived neglected and forgotten; the dauphin, whom the king disliked, because he did not wish to be reminded of his successor, was a friend of the Jesuits; there was no other prince of consideration. Consequently, all fell into Madame de Pompadour's hands; and till her death in 1764 she too might well have cried "L'état, c'est moi."

The noblesse.

And if the princes of the blood were ciphers, still more so were the nobles,—a needy well-bred throng, if of the older race, an obsequious and despicable crowd, if of the newer creations. To a large extent this proud noblesse was quite modern; for a long time noble fiefs had been changing hands rapidly; and as citizens grew wealthy they bought themselves into the sacred circle of privilege. No love of country, no desire to devote themselves or to resign their rights, existed in a body which had been steadily degraded by Louis XIV., had been tempted into display which meant debt, and had been carefully kept away from their estates, lest social independence should lead them to think and act for themselves. The more embarrassed and dependent they were, the better pleased was the spirit of absolutism, which thought it natural that they should crowd the army and disgrace the country in war by their vices, frivolities, and imbecility. When at last they had to stand up, face to face with the crisis of the Revolution, they were absolutely unable to defend themselves; their pride and poverty alike forbade them to sacrifice their privilege, and to submit to taxation with their fellow subjects.

The clergy.

The clergy were cut asunder, and had a divided existence. The prelates, bishops and dignitaries, and the religious houses, on the one hand, were in all essential respects on the footing of the nobles, and took part with them. They, too, were privileged landholders, who could inflict heavy burdens on the people, while they would bear no weight on their own shoulders. These are the privileged classes, who brought about the Revolution. The king and his court, the nobles, and the upper clergy,—these chiefly caused it, and these were the chief sufferers from it. The rest of the clergy were a very different race; they were simple curés, parish priests, by birth and interest allied with the people, not with their lords,—men whose meaner position gave them a chance of being and doing good. Arthur Young, who travelled through France on the eve of the Revolution, bears witness to their general excellence and devotion to their duties.

The citizens.

The burgher class in France had grown wealthier; manufactures were not unknown; trade increased rapidly; financiers, money-lenders, new nobles sprang from this class; the public creditor in these days grew to be a power in the state, very far removed from the peasant on the soil or the fierce artisan in towns, and yet advancing the revolutionary current by producing many of the writers, and much of the general intelligence of the time.

The lawyers.

By the side of them we may place the legal profession, that conservative body, which struggled in vain against all invasions of ancient usage, whether from the side of king or of people, and which in the end gave many victims and some leaders to the Revolution.

The peasantry.

In the country the state of the people was wretched, though it is true that in many districts the soil was already much subdivided, and the peasant proprietors numerous. It was reckoned that about a quarter of the soil was in their hands; yet their condition was little the better for this. Their burdens were still very heavy, their knowledge and methods of tillage rude; they had no capital to expend on the land, no good tools, no cattle, no manures; winter after winter they fell to famine-level, and sustained a miserable existence till the sun again revived them, and sent them forth once more to labor in the fields. Fortunately, the French winter is short; if, however, a long winter did set in, as in 1709, or again at the beginning of the Revolution, then the sufferings of the people were extreme, and multitudes perished of cold and hunger.

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The feudal aids and services—the corvée, the "pigeon-right," the game laws, the common wine-press, and common mill, and a hundred other oppressive and even fantastic services—left the peasant no rest, and forbade him ever to hope for comfort. As he gained in intelligence, and rose above the dead level of ignorance in which his masters had carefully kept him, he saw more and more to vex and anger him; as the people gained, they became more ripe for revolution. The robber bands in central France, and the inability of the authorities to cope with them; the growth of a large class of restless spirits, who dimly echoed some of the theories of the philosophers, and practised a new and lawless method of distribution of property, by robbing and destroying as they could; the diminution of population in the country, and the tendency of the land in the less fruitful parts to relapse into a wilderness,—these things all go to prove the wretchedness of the peasant life, and were all ominous of change.

The capital.

These conditions of the country, and the improvements of the burgher class, brought on another change which was little noticed at the time, though it afterwards forced itself on the attention of all Europe. For miles round Paris it became known that there was work to be had in the capital. In the 18th century Paris changed her character; no longer a mere court-seat or city of pleasure, she had gradually become a great manufacturing centre, and into her flowed crowds of dissatisfied or starving folk from all the country round. This immigration went on down to the great outbreak. It largely increased the city population, provided the rough material for the excesses of the Revolution, and helped to stamp the mark of Paris on the whole republican movement. It is hardly too much to say that the want of money at court, combined with the want of food in the cottage, brought about the explosion. These were the social and physical conditions of ferment,—the intellectual movement which dignified the Revolution with great names and imbued it with grand ideas demands brief independent notice.

Literature in France.

The literature of the Great Monarch's time is usually assumed to be the golden age of letters in France. Yet if power and effect on the destinies of men and states be taken as the test, the literature of the 18th century far surpasses that of the 17th. Molière and Racine had been at the beck of the court. They never appealed to the people; still less would the lofty muse of Corneille care to speak to common ears. But in the 18th century, by the side of the superstructure of society falling fast to pieces, and the oppressed substructure, growing daily more restless, the authors formed a third and an independent power, eager to push on the ideas of the age, as they found expression in sciences or practical matters, or as they formulated an easy philosophy or announced as startling novelties the earliest commonplaces of political rule. And the significant fact is that these simple rules of political life were really a revelation to France, and for the first time set her people thinking on such matters. So completely had the country ceased to be a political body,—so completely had the pernicious principles of Louis XIV. destroyed liberty and constitutional life, that all had to be begun again; and the field seemed open, as well for what appear to us to be the most harmless commonplaces, as for the most startling speculations and theories. The difficulty was that to France the one was just as new and strange as the other. It must never be forgotten that the Revolution called on her not to amend a constitution, but to make a fresh start, from the very beginning. Moreover, this state of things necessarily placed literature in opposition to all existing powers. The ancient faith, the old traditions of noble lordship, the learning of the lawyers, all alike were attacked with unsparing hand; and literature built up for itself a strong public opinion of its own among the classes which had hitherto been as nothing in the government of the country. The 18th century literature of France received its first impulses from England. The age of Queen Anne, the advance of philosophy and natural sciences and of letters in England, the quickened connection between the two countries in the days of the regency, had enormous influence on intelligent Frenchmen. Montesquieu, a nobleman and a lawyer, with the temper of a constitutional statesman, was the advocate of political liberty, after the English pattern. Voltaire became the champion of tolera-

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tion and freedom of conscience, and had learnt from Locke; the Encyclopedists, following the English leaders in natural science, wrote their vast dictionary of human knowledge, in opposition to all established beliefs; and lastly, Rousseau, the sentimentalist, addressed himself to the sympathies of the people, and was, in the end, the chief teacher of those who carried out the Revolution. Voltaire began his literary life in 1718, with his *Œdipus*, an attack on priestcraft. He had been brought up by the Jesuits, and yearned to attack them; in 1725 his *Henriade* exalted Henry IV., afterwards the hero of all Frenchmen in the Revolution, at the cost of Louis XIV.; then he was in England for three years, and came back full of English deism and English humanitarianism. Henceforth his life passed in alternate attacks on courts and adulation of them; he withdrew at last into the Genevan territory, whence he directed the defence of the oppressed, if they fired his sympathies. Thence also he encouraged the progress of the *Encyclopédie*, which, more than anything, undermined the shaking fabric of society. Meanwhile Montesquieu, in his *Esprit des Lois* (1748), as well as in his previous work on *The Greatness and Fall of the Romans* (1734), appeared as a first master of modern French style, and as a champion of English constitutionalism in opposition to the despotism of France. Though his works have been perhaps more popular in England than in France, their effect on educated opinion was still very strong. His views did not prevail in the Revolution-period; still, they had no small influence destructively, by pointing out to Frenchmen how indefensible was the government under which they were willing to live. "The *Esprit des Lois*," said Count Grimm in 1756, "has produced a complete revolution in the mind of the nation. The best heads in this country (France) for the last seven or eight years have been turned towards objects of importance and utility. Government is becoming more and more a matter of philosophic treatment and discussion." The writers on political economy also deeply influenced the tone of the age; their doctrines effectually disposed of the faulty maxims on which financial affairs had been conducted since the days of Colbert, and prepared men to see the importance of Turgot's plans, and the significance of Necker's *Compte rendu*. Lastly, Jean Jacques Rousseau, the clockmaker's son from Geneva, began his seductive strains. Musician and sentimentalist, he hit the right tone for the popular ear; between 1759 and 1762 he published the *Nouvelle Héloïse*, the *Contrat Social*, and the *Émile*; the *Contrat* was greedily devoured by society, high and low, as a revelation of a new code of politics, in which he boldly affirmed the sovereignty of the people, and the equality of all men, all being born free. His *Émile* was an attack on all existing ideas as to education; nature should take the place of the schoolmaster; and the priest and philosopher should alike be kept aloof from the training-ground for men and women,—for Rousseau was as little tolerant of the Encyclopedists and their science as of the Jesuits and their religion. Lastly, his *Héloïse* dealt with the moral code of mankind, subverting many ideas, filled with noble, often impracticable sentiments, and leaving the impression of change and uncertainty even in those subjects which seemed least open to difficulty. He appealed to men's conscience and sense of right against the ruling vices and selfish immoralities of the day; and men, seeing these glaring evils sanctioned by the presence of the priesthood, if not by its participation, warmly adopted the new ideas, and desired a revolution in morals as much as in religion or politics. It was the outcry of nature against the infinite falsenesses of a complex and corrupt society. The great *Encyclopédie* was managed chiefly by D'Alembert and Diderot; the former traced its ground plan, and wrote the preface and some mathematical treatises, while the latter supervised it, and acted as the chief editor. The general tendency of the work was to attack religion, and to substitute in its place the conclusions of modern science: with D'Alembert and Diderot worked Helvetius the materialist, Holbach, Grimm, Raynal, and Condorcet, of whom the last represents that passion for man, that warmth of heart and sentiment, which draws him somewhat near to Rousseau. Among the great writers of the time must not be omitted the harmonious Buffon, who laid before his countrymen a splendid sketch of the material world and of the creatures that inhabit it. It is the work of a poet rather than of a scientific student: we find a cosmogony, an eloquent picture of man and man's fellow-dwellers on the globe,—if written with truthfulness or not we need not ask; at any rate, with skill and power he enlarges men's horizon. He too can praise God in his works, and in so doing can leave the established beliefs on one side. In all the literature of the age we see new grounds for speculation on every stage: theology, letters, sciences, natural history, politics, constitutional ideas, morality, all alike are grappled with by writers who shake themselves clear of existing trammels. Rejoicing in a new freedom, they familiarize the younger generation of France with revolutionary ideas in every line, and render the coming explosion more complete and more permanent than any movement that the world has seen since the first preaching of the gospel to mankind.

Rousseau's writings.

The *Encyclopédie.*

Buffon.

1763-1774.

The fall of the Jesuits.

At the close of the Seven Years' War the Society of Jesus was on its trial throughout Europe. The Order had changed its ground; it had long ruled in kings' courts, and was paying the price of the means by which it had gained ascendency therein; it had become both rich and troublesome to society. And the general tendencies of the times were against it; above all, it incurred the deadly hostility of those enlightened ministers who, in almost every court of Europe, were directing the new-born energies of states. Such men as Pombal in Portugal or Choiseul in France could not but resist Jesuit influences which clashed with their own, whether these regarded the interests of courts or the welfare of peoples. In 1762 the parliament of Paris, influenced largely by Madame de Pompadour, took their affairs, which had become secular enough, into its consideration, and decreed that the Order should be abolished. Louis XV., after some hesitation, confirmed their decision in 1764, and the Order was expelled from France. It is significant of the general movement of the period that the other Catholic powers speedily did the same, until in 1773 Pope Clement XIV. (Ganganelli) finally suppressed the Order.

Choiseul's policy.

On the death of Madame de Pompadour in 1764, Choiseul still continued to hold the chief direction of affairs. His ministry, besides his belated foreign policy of the *pacte de famille*, was noted for more than one solid reform; he reorganized the army, instituted the *École militaire*, saw to the progress, so far as he could, of the navy, encouraged colonization, and in 1768 united Corsica to France. He represented the philosophic spirit at court, in antagonism to the Jesuit party, and the favor of Madame de Pompadour more than neutralized the king's dislike to him,—for Louis XV. was very jealous of any interference with the one branch of government in which he took interest, foreign affairs; and in these Choiseul was ambitious, if not very successful. So things went on till 1770, when a new mistress made the ground untenable for him. The low-born beauty, Madame du Barry, was the tool of all intriguers, and gained unbounded influence over the worn-out king. Choiseul and the Jansenists, who had enjoyed a brief tranquillity after the fall of the Jesuits, now went out of favor; the parliaments, which Madame de Pompadour had used and favored, were exiled, and in their stead came a new system of administration of law. The old purchase system, which gave stability to the parliaments, and dated from early Bourbon times, was swept away, and royal nominees were set to fulfil the functions of the parliaments. It was thought that the change from officials by purchase to officials by royal grace would be welcome. France, however, distrusted them, and said that the "gratuitous justice" so much vaunted, meant nothing but injustice guided by gratuities.

Madame du Barry.

The Parlement Maupeou.

Partition of Poland.

Louis XV. lived long enough to see the first partition of Poland (1772), that great blow to French influences in the north; nor could his interference hinder the signature of the peace of Kainardji in 1774, by which Russia, supported by England, got hold of the Black Sea shores. His effort to seize the Netherlands, as a counterpoise to these rapid additions to the strength of the northern powers, was a complete failure.

Death of Louis XV.

In the same year 1774 Louis XV. died,—died as he had lived, in flagrant vice. His reign of nearly fifty years had been a continual misfortune for France. During the period she is brilliant only in her literature, and even there we are conscious of something unwholesome and unnatural.

Some years before this the dauphin had died, leaving a

1774.

The character of Louis XVI.

young son, Louis, who was married in 1770 to Marie Antoinette, daughter of Maria Theresa of Austria. This young couple, handsome and well-meaning, now came to the throne in 1774, inheritors of the terrible destiny which Louis XV. had prepared for his grandchildren. He, cold and selfish, had foreseen the coming tempest; but "it will last my time," he said, and cared no more about it; he felt as little for his grandson as for his country. In the midst of the scandals of the court Louis XVI. had preserved his purity, and with it a charming simplicity which, while it seemed likely to render the difficulties of his position less, seemed also likely to arouse men's sympathies for him, and find him friends in need. And in later days, when he deserved it less, men, even while they struggled against him, often fondly called him "their good king." He loved his people, as a good despot might, and tried to mitigate their misery in famine-times; his kindliness, however, was but weakness—his simplicity stupidity; he was obstinate and yet not firm; and his good and bad qualities alike made him incapable of grappling with the new phenomena of society which broke on his astonished sight. We find that in the most thrilling moments of his history, his chief anxiety often was how he might get out to his hounds.

Marie Antoinette.

Marie Antoinette was a very different personage; she had much of her mother's high spirit; she was always a foreigner in France. In the early days of her beauty, when all Frenchmen were inclined to worship chivalrously at her feet, she shocked them by laughing at usages which seemed to them the ordinary course of nature. As time went on it was plainly seen that she came between the king and his tendencies towards reform; that she formed a court-party of her own, made and unmade ministers with no regard for the feelings of France, and no preferences except for the worse over the better public servants; that she more than neutralized all the king's economical wishes, and was extravagant and reckless; that in the crisis of affairs she led the king away from his subjects, and taught him to rely on German help. And so, while the virtues of Louis XVI. may have retarded the revolutionary outbreak for a few years, his weaknesses and the character of his spouse made the eventual explosion all the more complete and terrible.

Beginning of the reign.

The opening of the reign was a period of hope; all seemed to go so well. The king and queen themselves were no common mortals: so young, so innocent, so graceful, they formed a strange contrast to the gloomy selfishness of the past. And roused by a gleam of hope, literature itself also passed into sentimental idyls; the court was itself idyllic; at the Little Trianon the king and queen played at farm and mill; the unreadable sentimentalities of Florian were the delight of Versailles; the innocent pictures of Gessner's pen had a great popularity; the days of Paul and Virginia were not far off. These things occupied and deluded the upper world; the middle world smiled in bitterness over the keen satires of Beaumarchais; the lower world starved and turned uneasily on its frozen couch. The well-meant attempts of the court to administer charities, "to make little alms and great galas," as Michelet phrases it, only served still more to irritate the discontented crowd.

At first all seemed well; the ministers of Louis XV., obscure and corrupt, vanished; some gleam of prosperity shone on agriculture, and the court was inclined to reduce the disorders of finance. No able statesman could the king find at the beginning; he was obliged to trust to Maurepas, a frivolous and incompetent old man, who did the state one great service, for he led Louis XVI. to entrust the finances to Turgot.

The ministry of Turgot.

Turgot was a disciple of the economists, who had worked miracles of prosperity as intendant of the Limoges district,—a man of good faith, high character, and ability; but, like many others, he thought that what seemed so simple to him would at once commend itself to all, and entirely underrated the resistance which the interested noblesse and the court itself would make to his reforms. He at once proposed his remedies for the evils of the time,—the only true remedies—economy and the abolition of privilege. The state should spend less, and should draw its supplies from all orders of men alike. To the court and the nobles this seemed revolution and ruin: even the king was startled. Instead of supporting his minister manfully, he recalled the banished parliaments, and thought to shelter himself behind the law. The lawyers, however, special lovers of use and privilege, felt instinctively that Turgot was their foe; from that moment his fate was sealed. A great league was formed against him; the powerful help of the scandalous *pacte de famine*, the grain-ring which had been established with the approval and participation of Louis XV., was enlisted in behalf of the privileged orders; a famine ensued in 1775, and lasted three years. Louis XVI. was frightened; all seemed to be against him; and at last in 1776 he dismissed his one great minister. "Turgot and I are the only men in France who care for the people," was the king's mournful complaint; it was time that the people should begin to care for themselves.

1775–1780.

The *pacte de famine.*

Necker becomes finance minister.

Jacques Necker, an ingenious Genevan banker, who seemed to have the art of creating resources, now became finance minister. He was a high-typed charlatan, who grasped no principles, tried no heroic remedies, but thought only how to make credit and float the country over its difficulties. Unfortunately for him, the strain of war expenditure was added to his other burdens, for France was moved by her fate to take part in the American struggle now beginning. Necker's idea was that he might stave off the imminent bankruptcy of the state with paper and credit, and that, to be successful in this, he must lay the proper foundations of credit, knowledge and honesty in dealing. With this end before him, he wished from the beginning to issue his *Compte rendu*, and thereby to let France know how she really stood. This, however, he could not at first carry through, so that he was obliged to borrow for the state on his own credit, and to shift as he best might. People trusted him, and he crossed no angry and alarmed interest: but for the American war, he might have held out a considerable time. The war, however, was growing urgent. At first it had been volunteer work; for young French nobles, fired with a new zeal for liberty, went over to support the colonists in their struggle; and though the court at first was afraid of war, thanks to its embarrassments, it could only look with favor on this new sea-power rising up to counterbalance the overbearing supremacy of England. The most noted of the volunteers was the Marquis de Lafayette, who manned a frigate at his own cost. The Saratoga disaster in 1777 made more active measures necessary; the Americans were enthusiastic, and France, pushed by the popularity of the war at court, made a treaty of alliance and trade with the colonists early in 1778. Then began a great maritime struggle. England declared war on France, and tried to raise up embarrassments for her in Germany; but the skilful diplomacy of Vergennes, foreign minister of France, arranged the peace of Teschen (May, 1779), thereby avoiding a great European war, and also, in all probability, securing the independence of the United States; for it freed France from anxiety by land, and enabled her to push on her war at sea. An alliance with Spain against England followed. The war lasted about five years, and was marked at first by a striking revival of vigor in the French navy. The sea fight off Ushant (July, 1778), though it did not enable the French admiral D'Orvilliers to claim an actual victory, had revived hope and confidence in the country. The war was waged in five theatres,—in the Channel, at Gibraltar, in North America, in the West Indies, and in India. The French attack on Gibraltar in 1779 was entirely foiled by the strength of the place and the ability of Elliot; the threatened descent on the English shores came to nothing; in the West Indies D'Estaing defeated Admiral Byron. In 1780, however the English roused themselves, and their more real strength began to appear. Rodney defeated the Franco-Spanish fleet, relieving Gibraltar and Minorca from blockade; then sailing for the West Indies, he helped the English cause against the insurgent colonists and their friends. At this time a new and powerful engine was set in motion against England; it was in 1780 that the system of the Armed Neutrality, in which French diplomacy had a hand, was proclaimed by Catherine II. of Russia. Freedom of navigation for all was asserted. England had insisted on visiting neutral ships, and on confiscating all warlike munitions; she defined these by a long list of articles possibly useful to a belligerent, such as timber or iron, out of which ships could be built. The contention of the empress was that the flag protects the cargo; also that neutral ships, if escorted by a neutral war ship, are free from visitation, and

The peace of Teschen.

The armed neutrality.

that a "paper blockade,"—that is a blockade announced but not supported by a sufficient force,—is not to be recognized as real. France, Prussia, Spain, Denmark, and Sweden, the kingdom of the Two Sicilies, Austria, all adhered to the Russian proclamation, and equipped armed ships to assert this new and liberal maritime code. When Holland also joined the other states, England at once declared war on her, and crushed her without mercy. As an immediate result, the French navy seemed to secure the ascendant in every quarter. De Grasse defeated Howe in the West Indies, and sailed thence to support Washington and Rochambeau against Lord Cornwallis. The combination was thoroughly successful, ending in the famous capitulation of York Town (October, 1781), which indicated that the struggle between England and her colonies must soon end in the discomfiture of the mother-country. In 1782, however, things seemed to go better with England: in India affairs looked brighter; Rodney defeated De Grasse off Saintes in the Antilles; Gibraltar held out firmly, though Minorca had fallen. Later in the year England made peace with the colonists, and recognized the independence of the United States; it was felt that the new Rockingham ministry would be willing to make peace with France. And France, much as she had distinguished herself in the war, was too much exhausted to wish to push it further. The sea-rights of Europe had been asserted against England; America had secured her freedom; France had played a brilliant part, with one hand protecting Holland, and with the other giving independence to the United States; she, too, was quite ready for peace. In September, 1783, the treaty of Versailles was signed between France, England, and Spain. England restored to Holland the main part of her conquests, ceded Minorca and Florida to Spain, and to France her Indian possessions, confirming also the stipulation of the peace of Utrecht respecting Dunkirk. On the same day England also solemnly recognized the independence of the young republic of the West.

The treaty of Versailles.

The result of the war.

The *Compte rendu.*

The mismanagement at court.

Calonne becomes minister.

France came out of the war with much honor on all hands; as champion of liberty abroad, as founder of republics, as apostle of new ideas, she could scarcely be expected to feel a stronger attachment than before for her own despotic monarchy. The contrast was all against the old régime, and the heavy debts incurred in carrying on the war had added greatly to the embarrassments of the crown. Moreover, Necker was gone. He had struggled hard against the inherent difficulties of his position and the persistent hostility of the court; at last he had persuaded Louis XVI. to let him issue his balance sheet, the famous *Compte rendu*, early in 1781. The document, afterwards shown to be erroneous on the side of hope, was an offence to the spending classes, an assault on their privilege, a kind of act of treason in their eyes; that the king should keep accounts, and lay them before his people, was in their view scandalous; from the moment it appeared Necker's fate was sealed. The *Compte rendu* was more clear than convincing; it made out an actual surplus of ten million livres; and Necker hoped that, seeing this, confidence would recover, and, like a prophecy of good, the *Compte rendu* would then accomplish its own statements and make a solid surplus. For France in these years had certainly been growing richer and stronger; the duties on objects of consumption had increased two million livres a year; and Arthur Young declared that "in these late days the advance of maritime commerce has been more rapid in France than in England. Commerce has doubled in twenty years." Necker had therefore a sound basis to go on; but the court could not endure life on such terms, and in May, 1781, he had to resign office. From this time the queen's influence was omnipotent over the feeble king. She ruled with a succession of obscure and incompetent ministers,—first Joli de Fleury, then D'Ormesson, who, when he resigned office, left only about £14,400 in the treasury, after having borrowed nearly £14,000,000 sterling in two years and a half. These men were followed by the "ladies' minister,"—the Fouquet of that age, even as Necker had been its Law,—Calonne, the "enchanter," the "model minister," as the court styled him. He found "two little bags of gold, with 1200 francs in each, in the royal treasury,"—a rather slight foundation to begin upon. "There was," he says, "neither money nor credit; the current debts of the crown were immense, the income pledged far in advance, the resources dried up, public property valueless, the coin of the realm impoverished and withdrawn from circulation—the whole, in a word, on the very verge of bankruptcy." His idea was to mend matters by a gay and profuse expenditure; the queen should have whatever she wanted; "waste is the true alms-giving of kings" again became a state maxim; and all things should go on merrily, from minute to minute. So the great annual deficit continued unchecked. In the autumn of 1786 Calonne himself, in spite of his lively expedients and "gayety of heart," as he dragged the nation to its ruin, was forced to admit that the finances were in a hopeless state. He seemed to think that the privileged orders, which had so praised and petted him, would be flexible to one they knew to be their friend, and induced Louis XVI. to call an assembly of notables in 1787, before whom he laid the state of the finances and his proposals for reform. For forty years finance had been steadily going wrong; the deficit, which began in 1739, was a million and a third per annum in 1764; was, even in Necker's days, well over two millions; by 1786 had increased to more than six millions and a half; the best estimate Calonne could make for 1787 involved a deficit of five million pounds. Since Necker had come to power the total loans had amounted to fifty million pounds. Calonne, with irresistible force, argued from this that the ruin of the privileged classes impended. The argument was so unpleasant that they would not see it. He proposed that the *taille*, or land-tax, should be levied equally on all; that the odious right of *corvée*, which took the peasant's labor, and brought him under subjection to the lord, the intendant, and the money-lender, also should be swept away; that there should be free trade in grain, so that another *pacte de famine* might be impossible, and that all restrictions on traffic should be abolished. The notables replied with one voice (for they were all men of the privileged orders) that they would none of it. So Calonne fell, astonished at the ingratitude of his friends. Another queen's nominee, the incompetent Cardinal Loménie de Brienne, succeeded him. The anger of the people against the queen and her friends grew daily hotter; and, though she was absolutely guiltless in the matter, the scandal of the diamond necklace story in 1785–1786 seemed to give point to the popular discontent against her. She was frivolous and extravagant, and without the slightest feeling for the French nation; her love of amusement easily led people to take the worst view of all she did; she was identified in their minds with offensive foreign tastes and interests, and credited with French morals at their worst.

Ministry of Loménie de Brienne.

The accession to the ministry of Loménie de Brienne was the beginning of the end of the monarchy. He found at once that he must press on the privileged classes Calonne's proposals; and parties formed afresh,—on the one side the king, the queen, and the minister, supported by some of the noblesse; on the other the duke of Orleans, already beginning to take an active and ominous part in affairs, the main bulk of the nobles, and the parliament of Paris; the lawyers went with them in defending privilege. Below them all were the starving and angry people; in front of them the yawning deficit. The queen and her minister thought to save the ancient monarchy by abandoning the noblesse. To the people, however, it did not appear to be a question of one or other, but of their own claims and rights against both. No doubt the general bulk of the people would have welcomed a king who would reform loyally; Louis XVI., unfortunately, for all his honesty and well-meaning wishes, was not strong enough to face the difficulties before him.

The *lit de justice* of Louis XVI.

In August, 1787, the king held a great *lit de justice*, or personal visitation of the parliament, to enforce the registration of his edicts, and after he had thus overborne its opposition, he exiled that learned body to Troyes. Though the edicts were for a stamp-tax and for the equal distribution of the land-tax, the popular voice went with the parliament; for the more ambitious and active spirits would not accept as sufficient the reforms recommended by the queen's party. Their temper was becoming dangerous; the king's action was considered arbitrary; the people of Paris still deemed the parliament their friend. Before being exiled, the parliament had uttered the word which was destined to bring things to a head. In declaring their forced registration illegal and void, they had stated, in their anxiety to escape the new imposition of the equalized "taille," that the States-General alone could

The cry for the States-General.

legally impose taxes, a doctrine unfortunately unknown in France for many centuries. The whole nation heard the word, and learnt with emotion that the ancient monarchy had long been an usurper. Throughout the kingdom now rose up a cry for the convocation of the States-General. No one clearly knew what they were or how they would work; the last meeting of those august bodies, 173 years back (1614), had broken up in confusion; of the organization, procedure, and powers of the Estates no one could speak with certainty. Nevertheless, at the moment they seemed to offer hopes of a solution of pressing difficulties; and at last the king, with much reluctance, promised that they should be called together within five years.

Court and Parliament of Paris.

The parliament was then recalled to Paris; and the king held a "royal sitting," a different thing from the offensive *lit de justice*, and expounded to the lawyers his views as to the position of affairs. Ominous were his words, for they proved that he had no insight into the great questions seething, and that he clung in a dull and obstinate way to the traditions of the ancient monarchy. He showed France that he meant to deal in a narrow and hostile spirit with the States-General, and that he reserved to himself in all matters the ultimate decision. Lastly, he offered for their registration two edicts, framed, one might think, specially to affront his hearers,—the first (in opposition to the previous declaration of the parliament) authorizing loans to the frightful amount of 420,000,000 livres (£16,800,000); the other ordering the restoration of Protestants to their civil rights. Then the duke of Orleans, great-grandson of the regent Philip, protested, and the parliament, encouraged by his example, declared that the edicts had been registered by force. Orleans was exiled; and the ferment in Paris and through France became extreme.

The Jacobin Club.

The struggle between court and parliament grew bitter; the parliament declared *lettres de cachet* to be illegal, and affirmed that the queen's influence was the cause of the present evils. The court-party in rejoinder proposed to establish a plenary court for the registration of edicts. The parliament protested, and posed itself as defender of the liberties of France. They were forthwith shorn of much of their power, and their function of registration taken away. The local parliaments, throughout France, were treated in like manner, and it is from this circumstance that one of the most tremendous organizations of the Revolution took its rise. Remonstrants travelled up to Paris from different centres,—among others from the Breton parliament of Rennes,—to protest against the high-handed action of the court. The Bretons formed themselves into a club, which, having headquarters in the old Jacobin convent in the St. Honoré street, soon changed its name from the Breton Club to the Jacobin Club, and became the home of the most advanced republicanism.

Distress in Paris.

Things now went even worse. The old *pacte de famine*, which the humanity of the king had kept down, again began its baleful operations; the disorders of finance went on; there was no money with which to carry on the government. Brienne, at last driven to despair, induced the king, in spite of the queen's strong opposition, to convoke the States-General for the 5th May, 1789. Soon after this, unable to face the difficulties of finance, and having tried in vain a kind of concealed bankruptcy, he gave way and sent in his resignation. Necker was recalled. The winter of 1788–1789 was terrible—especially in Paris; and all France was excited by distress and hope. The capital swarmed with incomers from the country districts round; ever since the great hailstorm of July, 1788, when the crops ripe for the sickle had been destroyed in all the best corn-growing district of France, the district round Paris, crowds of desperate country folk had been pressing in. "All this mass floats about Paris," says M. Taine, "is engulfed therein, as in a great sewer, the honest poor and the criminal alike; some seek work, some beg, all prowl about, a prey to hunger and the rumors of the streets. The officials note that a large number of sinister-looking men pass the barriers inwards." . . . "The general aspect of the mob changes; it contains now a quantity of strangers from all parts of the country, mostly in rags, armed with great sticks, whose very look is menacing." "Vagabonds, ragged fellows, many almost naked, with appalling faces—beings one does not remember to have seen

by daylight,—a frightful physiognomy, a hideous attire." Such is the impression left by the crowd of refugees and others who swarmed in the lower districts of Paris; this is the rough material out of which the Parisian and decisive element in the Revolution will be made. The Government thought little of this for the time; the States-General were to meet not in Paris but at Versailles, under the shadow of the monarchy; Paris, long neglected and disliked by the kings of France, was left out of their calculations at this moment.

IV. THE REVOLUTION.

The French Revolution.

We are come to the verge of the French Revolution, which surpasses all other revolutions the world has seen in its completeness, the largeness of its theatre, the long preparation for it, the enunciation by it of new points of view in politics, its swift degradation into imperialism, its influence on the modern history of Europe. It has been truly said that France had for centuries been preparing for it, for centuries she would feel the effects of it. The imperialism, which has traversed and marred its due development, has perhaps already passed away—its destructive work is over; the republic under which France now lives may be the turning point of European history.

Causes of revolution.

For all revolutions there are needed first a favorable concurrence of external circumstances, —such as, in France, the character of Louis XVI. succeeding after his grandfather, the anti-national temper of his court, the outbreak of the American War of Liberation, the ferment of modern ideas in all the countries of Europe. Next, there must be a "semen martyrum," a faith of internal conviction which will strengthen men to face death for their cause, because their minds are lifted above common life and its trivial affairs; this, too, existed in France, and cannot be underrated as a motive power. Sometimes partial and narrow, yet always generous and warm, was the enthusiasm of younger France for the "principles of '89:" the equality of all men before the law and for the burdens of citizenship, the excellence of virtue, the sovereignty of the people, obedience to the law, the blessings of freedom of person, press, and belief, —these and the like, afterwards embodied in the *Déclaration des droits de l'homme*, were great engines which set the Revolution moving, and directed its general course. Joined with these ideas, which cannot reach down to all, there must be a general feeling of misery, oppression, wrong. This the scandals of finance administration, the despair of frequent famines, the grievous incidence of the *corvée* and other ancient services, the inability to get away from the soil or to rise, largely supplied. Moreover, the divergence of classes, which in France had long been increasing, was such as to endanger in itself the stability of society. The older creeds, too, were dying down into their embers, and had lost the power to arouse enthusiasm; while the ancient framework of long worn-out institutions still encumbered all the land, and with their dead weight pressed men down. Selfishness above, hypocrisy in faith, misery below,—these things demanded vocal leaders for attack, and the leaders were not wanting—they were first the great writers, and afterwards the chiefs whom the violence of the time threw to the surface.

The claims of democracy.

Europe had long been uneasy; the "benevolent despots" had tried their utmost for the people and against privilege; enlightened ministers seemed to themselves to be carrying out the principles of Richelieu; they fought against custom and institutions, irritating, weakening, even reversing them. And yet in all they scarcely recognized the existence of Democracy, of a people which would be heard, and would take the foremost place in the rearrangement of Europe. While the monarchs who said of their business with Joseph II., "*C'est d'être royaliste*," were levelling privilege or church immunities, dismissing parliaments or exiling Jesuits with a view to raising their own authority, they little knew that they themselves were in danger. For the new democracy changed the centre and place of sovereignty, and while, as De Tocqueville says, "it swept away the feudal institutions and replaced them with a social and political order more uniform and simple, and based on the equality of the condition of all," it was also sure profoundly to modify the views of Europe as to the position of the monarch, as to the headship and sovereignty in a nation. And the great change began in France, not because she was more, but partly because she was less oppressed than her neighbors. In comparison with the German, the French peasant had many advantages,—there was less serfage, there were more peasant proprietors. "This," said Arthur Young in 1788, "is the mildest government of any considerable country in Europe, our own excepted." This milder state of things made men more capable of indignation against the injustice they could feel; the most crushed do not feel the most; they are helpless, ignorant; but when men have begun to rise and to understand, then they grow dangerous to their masters. The very attempts made by benevolence in high place to succor the misery of the people roused their anger against their lords,—a point to which De Tocqueville dedicates a whole chapter, entitled "Comment on souleva le peuple en voulant le soulager." In addition to this we must remember that the Revolution found much to forward it in the brightness of the French temperament. The simple principles it preached, with accompanying appeals to virtue and patriotism, at once commended themselves to a people fearfully ignorant, yet unusually intelligent and lively. In their strength and their weakness alike the French people were singularly well fitted to be the heralds of the new conditions of political life in Europe.

The States-General of 1789.

The manner of election.

Early in 1789 all France was busy with the elections to the States-General, and in drawing up the *cahiers*, or papers of grievances. From the moment of the king's edict (8th August, 1788), convoking the States-General, discussions had gone on with growing eagerness as to their proper constitution and form. Some urged the pattern of the English constitution; others wished for the forms of 1614; others pointed out the increased importance of the third Estate in numbers and wealth. It was seen that the Estate which in fact would be called on to pay almost the whole sum to be raised must have greater strength than the precedent of 1614 could give it. Bankruptcy stared the court in the face; the king only called the Estates together because the finances were in a frightful condition; he openly sets this forward as the chief reason for their convocation. A demand accordingly arose for two things:—first, that the third Estate should be composed of as many members as the other two orders combined; secondly, that the three orders should debate and vote by head, in one chamber. It was urged on this hand that thus only could those defend themselves who would have to pay the taxes; on the other hand, that to sit in one chamber would be a dangerous innovation, and that a majority of the third Estate would set the unprivileged public above the privileged few. The parliament of Paris, with its lawyer-like preference for precedent over justice, and its incapacity to discern the real issues before it, warmly supported the latter view, and urged the king to follow the rules of 1614. The popularity they had up to that time rather undeservedly enjoyed was destroyed in a moment; it was seen now that the lawyers were as earnest for privilege as the rest. A convocation of notables, chiefly members of the privileged orders, to rule the form of procedure, in spite of Necker's efforts, supported the views of the parliament. The matter grew warm; the princes of the blood, Artois and Condé and the others, who had supported the queen in all her follies, added their remonstrances in the same direction; the popular ferment spread all the more, and Necker became the idol of the people. By his influence the king was induced at last to issue an edict to the effect that there should be in all full a thousand deputies to the States-General, made up in proportion to the population, and that there should be as many deputies of the third Estate as of the other two combined. As to the one-chamber question the decree was silent. In former States-General the third Estate had usually sent more than either of the others; in those of 1560 the third Estate had much exceeded the other two combined, so that this great concession was little more than a continuance of ancient use. It was also decided that the election should be by a double process. The electors, in number about three millions, were limited by no property qualification; it was a kind of simple household suffrage in the country districts, each 200 hearths choosing two representatives, and so on; in the towns two delegates for each 100 inhabitants, and so on upwards,—so that the towns chose twice as many primary delegates as the country districts did for their numbers. These delegates from bailiwicks and towns were empowered to meet in the chief town of each province, there to draw up their *cahiers*, and to choose from their own body the persons who should proceed with the grievances in hand to Versailles as members of the third Estate.

The numbers of the Estates.

The elections to the first Estate, the clergy, returned 291 members,—48 archbishops and bishops, 35 abbés and canons, 208 parish priests; these latter were largely in favor of liberty, and when the time came supported the third Estate in its struggle, while the bishops and higher clergy mostly went with the privileged orders. The second Estate, the noblesse, returned in all 270 persons, one prince of the blood, 28 magistrates, 241 "gentlemen" or holders of noble fiefs. The smallness of their total is due to the proud abstention of the Breton nobles. There were among them a few who sympathized with the popular movement,—at their head the duke of Orleans. The third Estate was composed of 557 members, nearly half of them barristers, and almost all united in defence of the country against privilege. The *cahiers* of all the orders, the third no less than the others, breathed a very moderate spirit. Almost all spoke warmly and hopefully of the king,—all expressed respect for the royal power. The *cahiers* of the nobles urged the interests of their order without hesitation; those of the clergy desired the bettering of the condition of parish priests; those of the third order insisted on the abolition of the unequal rights and services, which were felt throughout France to be a great grievance and hinderance to the well-being of the country.

The treatment of the third Estate.

The National Assembly.

The king's want of wisdom.

When the three Estates met at Versailles, it was seen that the points at issue were not easily to be settled. The action of the king and his ministers was exceedingly foolish and weak; instead of taking a vigorous line with the question of the vote by head or by Estate, they lingered over trivial questions as to order and etiquette, which could only irritate the "representatives of the people," as men now began to call the third Estate. They must kneel to present their *cahiers;* when they met they must enter through a back door, while the others entered through the main gateway and stood in the royal presence. In a number of petty matters the court seemed determined to remind them that they were inferior to those with whom they sat, while they, in the language of the Abbé Sieyès, felt that "the third Estate was the nation, less the privileged orders." The folly of this treatment strengthened their hands, as did also the blunder of providing no separate hall for them to sit in. After the opening session, when all met the king, they installed themselves in the great Hall of the Estates, and so took possession of the ground they were only too eager to occupy. The verification of powers was the first step to be taken. They urged at once that the three orders ought to verify together, sent invitations to the other orders, which verified separately, and set to work at their deliberations. The third Estate waited, refusing to proceed till they had solved the main question. Meanwhile the court upbraided them for wasting precious time; it became daily clearer that all their masters cared for was that they should arrange for the payment of the deficit and be gone; and then after some delay, they began to verify, taking on themselves to call the roll of all three orders. At the first call no response was made by either noble or clergyman; at the second three curés answered, and were received with enthusiasm; after a short time as many as 100 members of the clergy joined them. They named themselves "the National Assembly" (17th June, 1789), and issued a declaration that the creditors of the state were guaranteed by the honor and loyalty of the French nation; that if they were dissolved, taxation levied thereafter would be illegal; that a committee should be named to inquire into the general distress. Then the clergy, by a small majority, agreed to join the third Estate, and did so; Necker thereon advised the king to yield the point of separate chambers, and to "deign to resign himself to the English constitution," a phrase singularly indicative of Necker's temper and views, and just as inapplicable to the real state of the case. The king, however, would not yield. Though Necker knew, and the king should have known, that the army could not be trusted against the Assembly, he committed himself once more to stupid and irritating tactics. The great hall was closed against the representatives, and they adjourned to the neighboring tennis court, where they took solemn oath (20 June, 1789) that they would not separate till "the constitution of the kingdom had been established and confirmed on solid foundations."

The Constituent Assembly.

Under this oath the Assembly claimed a new name, that of the Constituent Assembly,—the Assembly charged to create a new constitution. The king showed utter want of discretion: he annoyed the moderate party in the chamber, who were headed by Count Mirabeau, by refusing to give them any insight into his plans and policy; he alienated any support he had within the Assembly, because he regarded it as a usurping body, insulting to him by its claim of permanence and authority. Next, the Assembly was told that the tennis court was wanted by the count of Artois—the most unlucky of all the supporters of the queen's policy, the most offensive to the people. Once more treated by the court with contempt, because it could not venture to use violence, the Assembly next met in the church of St. Louis at Versailles on the 22d of June. On the 23d they were summoned to a "royal sitting" of all the orders, in which the king lamented the conduct of the commons, and declared the concessions he would grant. The representatives of the people, who had been treated with the scantiest courtesy that morning, received the discourse in silence—a silence deep and anxious, especially when Louis XVI. told them, speaking as an angry master to disobedient servants, that the orders should not act together, but should meet next day in their separate chambers. When he rose to go, he was followed by most of the nobles, the bishops, and some clergy; the third Estate and a large proportion of the parish priests remained, and sent a message to the king to say that they would only retire if forced to do so by the bayonet. Necker, feeling that the king was completely committed, now resigned. The duke of Orleans, with 46 of the nobles, joined the Assembly; after that, force being out of the question, Louis XVI. was obliged to tell the remainder of the noble order to join the others. And thus by June 27, 1789, the orders had all accepted the victory of the commons. The king now threw himself entirely into the hands of the court; Necker's resignation was accepted; attempts were made to get regiments that could be trusted to Versailles; the Swiss and German troops seemed the mainstay of the monarchy.

First collision with the people.

On Monday, 12th July, it came to a collision between the troops and the people. In dispersing a "Necker procession," an enthusiastic unarmed crowd following a bust of the ejected minister, Prince Lambesc, acting under Baron Besenval's orders, fired on the people. A French guard chanced to be among the killed; thereon the whole guard sprang into revolt; the old municipality of Paris, the ancient provost and échevins, who were royal nominees, were swept away; a new provisional municipality arose, and a new Parisian militia.

The tricolor.

The tricolor flag sprang into existence,—red and blue, the old colors of Paris, with white, the significant ground work of the new constitution. The troops cantoned on the Champ de Mars were now powerless against Paris, which had taken the lead in insurrection and incipient revolution; while the Assembly at Versailles was surrounded by foreign troops, and in danger of forcible dispersal. Paris quickly consolidated her movement. On the 14th of July the new civic guard seized the arms at the Invalides, and on the same day took place the assault on the Bastille.

Fall of the Bastille.

The troops at the Champ de Mars could not be trusted; Besenval drew them back to Versailles. The fall of the Bastille was sullied with broken promises and unnecessary bloodshed; for now the fierce passions of civil war began to move, and the Paris mob had in it desperate and savage elements. The Bastille was levelled to the ground; it symbolized the overthrow of the ancient and worn-out institutions of the monarchy.

Then the king again appeared in the Assembly, declared that he would remove his troops from Paris and Versailles, and appealed to the fidelity of the Estates. Paris grew calm at once; Bailly was made mayor, and Lafayette commander of the civic forces.

Louis XVI. in Paris.

Louis XVI. went further still; he visited the capital (17th July) and appeared with the tricolor cockade on his breast. The Parisians welcomed him with enthusiasm, and a happy reconciliation seemed to have taken place. The party of Philip of Orleans sank into the background. Unfortunately for the monarchy, the queen would not loyally accept the situation. Louis XVI. might have become a constitutional sovereign—a first *roi des Français;* his court made it impossible for him. On the very night before his visit to the Hôtel de Ville the emigration of dissatisfied nobles began, and the plans of the court-party at once changed form; from plans they became plots. The queen stayed behind, for she was fearless in disposition and loyal to the king. She only succeeded in involving him with herself in utter ruin.

By the 22d of July the first stage of the Revolution was complete. The events of Paris and Versailles found response throughout France; national guards were organized everywhere; the nobles, attacked by the peasantry, made for the frontiers; some laid down their privileges, and hoped to stay in France. The Assembly, backed by Paris, had all power in its hands; the king had to recall Necker, whose vanity and shallowness were not yet found out.

Constitution-making.

On the 4th of August the Assembly got to work at its business, the framing of a new constitution. With so few solid institutions as France had, with not one true constitutional tradition, with passions aroused and great underhand opposition at court,—it is a marvel that so much was achieved. Privilege was at once abolished, the last relics of feudal use swept clean away; nobles, clergy, the *pays d'états*, cities which enjoyed local liberties and advantages, all laid down their characteristic and special privileges, and begged to be absorbed in the equality of one general French citizenship. Equality is the prominent feature of the Revolution epoch; it overshadows at this moment both liberty and fraternity. The practical carrying out of the principles of equality was not so easy; many who laid down their privilege in words, clung to it in fact; it caused ugly scenes in the country; and the feudal burdens were in some places hardly removed till the very end of 1790. The Assembly next declared the king to be "the restorer of French liberties," and offended him, on the other hand, by reducing his hunting-rights to those of an ordinary landowner. The king's *capitaineries*, a circuit of some 40 to 50 miles round Paris which had been felt to be very mischievous to agriculture, and connected only too closely with the famines of Paris, were much curtailed. When these things were laid before the king, it was seen that his heart was not with the Assembly; on technical grounds he refused to sanction them.

The declaration of the rights of man.

Then the Assembly advanced to the consideration of a great declaration of the rights of man—a general statement of the principles and bases of civil society. Carlyle sneers at the resulting document:—rights, yes, but duties, where are they? and what reference is there to might? Still, it is clear that, had the Assembly not occupied itself with this reasonable and logical statement, its enemies could at once have accused it of haste and inconsequence, of passion and pure love of destruction. As a fact, the Declaration of the Rights of Man ranks, as Madame de Staël says, side by side with the English Bill of Rights and the American Declaration. This last was addressed to a people happily quite ignorant of all feudal questions, while the English Bill of Rights dealt solely with practical matters, assuming the main principles of constitutional life to be known, whereas the French Declaration had to begin a fresh epoch—to appeal to a people shaking themselves free from absolutism and feudal oppressions, to affirm the first principles of civil life, to give practical expression to opinions floating in every mind. To us the Declaration reads like a string of political commonplaces; we are familiar with the whole row. To the French it was very different, for they were beginning a new life, and scarcely knew where to tread.

The clauses of the declaration.

This charter of the Revolution is in substance as follows. (1) All men are born and continue free and equal in rights; social distinctions are purely conventional. (2) Society is an association of men to preserve the natural rights of men. (3) Sovereignty resides in the nation; all authority, vested in an individual or a body of men, comes expressly from the nation. (4) Liberty is the power of doing what we will, so long as it does not injure another; the only limits of each man's natural right are such as secure the same rights to others; these limits are determinable only by the law. (5) The law can forbid only such actions as are mischievous to society; "Quod lex non vetat, permittit." (6) Law is the expression of the general will; all citizens have a right to take part, through their representatives, in the making of the laws; law must be equal for all; all citizens have equal rights (according to their fitness) to fulfil all offices in the state. (7) Accusation, arrest, detention, can only be in accordance with the law, which all are bound to obey. (8) The law must be reasonable; it must not have any retroactive force. (9) Every one is to be deemed innocent till he has been convicted; persons under arrest on suspicion must therefore be treated gently. (10) All men are free to hold what religious views they will, provided they are not subversive of public order. (11) Freedom of speech, of writing and printing (save in cases reserved by the law), is one of the most precious of the rights of man. (12) A public force is needed to guarantee the rights of man; such a force is for the benefit of all, not of its own class. (13) To support such force a common contribution is necessary; it is to be equally laid on all citizens according to their means. (14) All citizens have a right to show (personally or by representatives) that such public contribution is necessary, to consent thereto, to arrange its application, its incidence, its manner of ingathering, its duration. (15) Society has a right to demand from every public servant an account of his administration. (16) A society, the rights of which are not assured, the power of which not definitely distributed, has no constitution. (17) Property being an inviolable and sacred right, no one can be deprived of it, save when public necessity, legally established, evidently demands it, and then only with the condition of a just and previously determined indemnity.

The declaration acted on.

Having laid down these principles, the Assembly went on to abolish such institutions as offended against the liberty and equality of the rights of man. "Nobility, peerage, hereditary distinctions, distinctions of orders, feudal régime, patrimonial justice, titles, denominatives or prerogatives thence derived, orders of chivalry, corporations, etc., which required proof of nobility or presupposed distinctions of birth," were all declared to be swept away, such distinctions alone remaining as belonged to public functionaries in discharge of their duties. Venality or hereditary succession in offices was also abolished; all Frenchmen in all parts of the country should have equal and common rights; no guilds or corporations should remain; nor would the law recognize any religious vows or other engagements which might militate against either natural rights or the constitution. Such, from end to end, is the Declaration of the Rights of Man. Equality of all men, abolition of feudal privilege, inclusion of the monarchy under the control of the sovereign people —these are the chief principles involved in it; out of these the Revolution grew. In itself the Declaration was not subversive of monarchy; only the French monarch, with two centuries of Bourbon tradition behind him, could not stoop to take a new position in France; Louis XVI. could not become a constitutional king. The Assembly also framed its new constitution, according to the promise of its oath of the tennis court. A limited monarchy, without an absolute veto, and a single chamber having alone the right of initiation of laws, formed the chief elements of it,—the nation to order, the king to execute. "The Revolution from its social side attacked the aristocracy," says La Vallée, "from its political side it attacked the monarchy;" and the single chamber, with a royal suspensive veto which might be overruled in time, seemed to the French people best and simplest. The great danger of the Revolution lay in its simplicity; everything was to begin from a pure white basis; there should be no checks or counterpoises; all should be consecutive, logical. The ambitions, vices, prejudices of men were regarded as nothing; the nation, not even educated as yet, was thought fit to be trusted with absolute power. It is indicative of the ferment and the ignorance even of Paris that the very name of veto aroused vehement disturbances; the royal veto was in their eyes the old régime restored.

The constitution.

The excitement of Paris grew; famine reigned; distrust and irritation followed. It was seen that the royal family were surrounding themselves with troops ill-affected towards the Revolution, and with a great number of devoted officers. Rumors flew through the town; plans of vengeance were supposed, communications with foreign powers and emigrant nobles. The king's reception of the Declaration of the Rights of Man had been cold and partial; the new journals of the time threatened fresh disturbances. At this moment (3d October, 1789,) the amazing folly of Versailles showed itself in a great banquet given to the soldiers, in which royalist songs, white cockades, ladies' smiles, and plenty of food goaded the hungry "patriots" of Paris to madness. A vast crowd, chiefly of women, with the national guard, headed unwillingly enough by Lafayette, streamed out of the gates, and marched to Versailles, insulted the Assembly then sitting, and swarmed round the palace gates. When the king came back from his hunting,—his one solace in these difficult days,—he spoke them fair; but a struggle having begun, in which some blood was shed, he became in fact their prisoner. In an interview with Lafayette, he showed his wonted obstinacy, and practically refused to send away his Swiss guards. Things became very threatening, and Louis at last consented to go to Paris. The queen and the dauphin refused to leave his side; a deputation of 100 members of the Assembly also accompanied him.

The Versailles banquet.

The triumph of Paris.

Thus Paris at one blow gained the ascendant over both king and Assembly, and the Revolution entered at once on a new phase. Changes will become easier, the seat of government and movement being narrowed to one city. The vehement eagerness for discussion of political questions, already so prominent a feature of the time, will increase greatly; crowds will frequent the meetings of the Assembly, interfere with its discussions, sway its fears and wishes. "There is a gallery," says Arthur Young, an eye-witness (12th January, 1790), "at each end of the saloon, which is open to all the world. . . . The audience in these galleries are very noisy; they clap when anything pleases them, and they have been known to hiss—an indecorum which is utterly destructive of freedom of debate." The press became more active than ever, with countless pamphlets on the questions of the day; and lastly, the influence of the clubs, especially of that of the "Friends of the Constitution," the Jacobins Club, now began to take the chief direction of affairs for the more thorough revolutionists. With its affiliated clubs throughout France, it formed an all-powerful confederacy, and became the rival of the Assembly itself. The virtual imprisonment of the royal family at the Tuileries frightened the royalist gentry; a second and more numerous emigration now took place. Suspicion and distrust reigned; all held their breath, and thought they felt beneath them the muffled mining of some plot. Royalists accused the ambitious and unsteady Philip of Orleans of making disturbances for his own purposes in Paris; republicans felt sure that the queen and her party were plotting the overthrow of the new order of things with the emigrants and her German relations. The duke of Orleans, a silly and stupid giggler, as Arthur Young found him, was driven by Lafayette to take refuge in England. The two chief parties of the Assembly, the Right and the Left, represented those who hoped, as Mirabeau did or Lafayette, to secure a modified and constitutional monarchy in France, and those who desired to see a republic. Independent of these, who were intent on the framing of the constitution, was the court party, which hoped to restore things to their ancient form, and to bring back the monarchy and the system of the past.

The Jacobins Club.

The emigration.

The making of the constitution.

The Assembly now set itself to frame the constitution,—the task to which it had solemnly dedicated itself. In France herself there were no precedents to go on, no healthy institutions to be worked in. The clergy were powerless; the nobles, who might have modified and influenced matters, were contemptuous and careless. Arthur Young specially notices their flippant treatment of the crisis they were in; they did not really believe that the new order of things could last, and even expected a counter-revolution. Some of them thought that by pushing the innovators onward they would secure an earlier reaction; doing so, they worked their own ruin and the king's death. The active leaders of the Assembly had then no help at home; they spurned the example of the English constitution, which was often urged on them, for they considered it with truth far too monarchical and far too aristocratic for their principles. It was then almost from a "tabula rasa" that they had to start,—without institutions to use, without experience to warn, or examples to guide them. They were sincere, and knew their own minds, fearlessly pushing the principles they held to their results. Their first achievement was to carry out

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the Declaration of the Rights of Man in territorial matters, by totally rearranging the soil of France. They would consolidate and centralize, and show that unity pervaded all.

The geographical rearrangement of France.

With this end in view they swept away all the ancient historic provinces, which one misses so much on the map of France. No more duchies and counties, *pays d'états* and *pays d'élection;* no local rights or specialties were preserved; the local parliaments were swept off, the local administrations abolished; the very names of Breton or Provençal, it was hoped, would be absorbed in the greater name of Frenchmen. Instead of the old divisions, the country was distributed into 83 portions, as nearly as might be of one size, and these were named departments; each department was subdivided into districts, and each district into cantons or communes. This done, the political structure was at once begun in accordance with it: each department should have a council of thirty-six members and an executive directory of five; the districts similarly should have officers, subordinated to those of the department; the communes also, in like wise, under the districts.

Active and passive citizenship.

Then came the distinction between *active* and *passive* citizenship, as a base for the franchise. Active citizens, who paid taxes equivalent to three days' labor and upwards, alone had a vote; there was a higher property-qualification for the electors whom they had to choose. The passive citizens were excluded from all share of power. The electors were charged to choose deputies for the National Assembly, administrators of departments, districts, and communes, and eventually judges, bishops, and parish priests.

Revision of the judicial system.

The judicial system was entirely recast. In place of the local parliaments there were to be three orders of tribunals,—cantonal, district, and departmental; and above all, at Paris, a great supreme court. The system of trial by jury was introduced for criminal cases.

The functions of the Assembly.

The National Assembly should be the fountain of legislation, should be permanent, and of one chamber only; it should be renewed by biennial elections. Its number should be 745, distributed among departments according to the proportions of land, of population, and of taxation. The Assembly also laid down a definition of the citizenship, and marked out the position of the king.

Finance.

It next considered the state of the finances; for now, even as under the old régime, France was threatened with imminent bankruptcy. Loans were not taken up, taxes fell short, patriotic contributions ran dry. In this great peril, Talleyrand-Perigord, bishop of Autun, proposed to apply the lands of the clergy for the purpose of meeting the deficiency.

Sale of church lands.

The committee of finance declared by his voice that the clergy were not proprietors but administrators only, and that the nation could take on itself the expenses of public worship, and resume its ownership of the lands of the church. In spite of the vigorous resistance of the clergy, and their offer to make a gratuitous gift of part of their lands, the Assembly adopted the proposal, and ordered the sale of the ecclesiastical domains. The argument that these lands were part of the absolute property of the Church Catholic in general, and not of the French clergy in particular, was too unpatriotic to be listened to. The sale, however, was a failure; men were too much frightened by the rapid movement of affairs to feel much confidence, and things again seemed to be at a stand-still. Then the Paris commune hit on a plan which succeeded. The municipalities throughout France were authorized to buy these lands from the state, and to sell them again to private purchasers; and the municipalities might pay for them in bonds, or *assignats* as they were called, based on the actual value of the land. It was ordered that the issue of assignats should be limited, and that they should be extinguished as the lands passed into private hands, and hard money was given for them. The measure brought instant relief to the Government, and the assignats, as has been said, "saved the Revolution."

Civil constitution of clergy.

Then followed the "civil constitution of the clergy," in which the state made a great step in the direction often since taken with more or less success,—the direction of controlling the spiritual powers. The Assembly began by affirming the constitution to be based on Christianity, while it refused to admit a state-religion, abolished monastic vows, religious orders, and confraternities, with exception of some useful ones. It then, following the impulse of uniformity given by the new partition of the soil into departments, rearranged the ecclesiastical divisions on the same basis,—a bishop to each department, and so on.

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The end of the Jansenists.

The influence of the Jansenists among the clergy in the Assembly was felt in all this; it is their last appearance in French history; after 1790 their name hardly ever occurs again. It was clear that the upper clergy and the bulk of the lower would resist this proposal. If the state severed the ancient relations between the church and itself, it must, to a large extent, leave the church to manage its own affairs. As it was, the state had laid hands on church lands, had declared against the connection, and yet was determined to rearrange the spiritual domain. Finding strong oppositon, the Assembly next ordered the clergy to take an oath of obedience to the civil constitution. This, however moderate as it was in itself, involved an acknowledgment of the authority of the state, which in fact prejudged the whole question; consequently, fully five-sixths of the clergy refused the oath, and they with their flocks were still a very considerable power in France. The result was that the interference of the Assembly in church matters broke up parties very much, and threw the power almost entirely into the hands of the non-religious sections of the body. The sight of the church in rebellion, the contempt and aversion with which the priests who took the oath were regarded, put religion into definite opposition to the Revolution; though Jansenists and Huguenots were warmly attached to the new order of things, their influence was weak. Henceforward, in the mind of France, Christianity was regarded as identical with reaction.

Abolition of nobility.

The lawyers and the clergymen had thus been dealt with; it remained to abolish nobility. "The lawyers had caused agitation in the country; the clergy had kindled civil war; the nobles were now about to produce foreign wars." The decree of June 19, 1790, swept away the last distinctions of feudal origin, and the nobles and bishops deemed themselves no longer bound by any ties to the new order of things. They did all they could to push matters to excess, with terrible results to themselves. As the nobles alone officered all the regiments of the army, they had great power in their hands.

Officers and privates.

The gulf between them and the privates, the scandals of mismanagement, the spread of revolutionary opinions in the ranks, after a time rectified the evil, and the army before long became the chief support of the new republic. In August, 1790, a kind of struggle went on; in many places the regiments chose officers from among themselves, and turned out their noble masters; in other places they accused the officers of plundering the military chests,—an accusation in some cases only too well founded. At Nancy, under Bouillé's orders, a revolt of three regiments on this ground led to a terrible battle in the streets, in which the regiments and citizens were mercilessly crushed by the garrison and national guards of Metz. It was done by command of the Assembly; Paris, however, and the revolutionists generally, sided with the defeated regiments, and the king, the Assembly, and Lafayette all lost ground through it.

The position of Louis XVI.

Up to this time Louis XVI. had shown himself willing to go with the Assembly. For a while he seemed really to wish to be a constitutional monarch, and, till after the fête of July 14, at which he, the Assembly, the national guard, and a crowd of spectators from all France, renewed, in the midst of boundless enthusiasm, the civic oath, all seemed to promise well. The Assembly had voted a liberal civil list; they had treated him with courteous respect; he seemed thoroughly popular. Had he been a man of any real vigor of character, he might have held the movement entirely in his own hands, and have shaped the future constitution of his country, saving it from extreme measures, great excesses, savage civil war, and tremendous efforts to keep off the foreigner. This, however, was not in him; his amiable disposition drew him one way, the traditional belief in his irresponsible and divine right drew him the other; he became undecided; people grew suspicious. Necker, not a strong man, had hitherto been his guide; he had now lost all his popularity, for public opinion had gone far beyond him, and he was not statesman enough either to direct or to assist it. He sent in his resignation (4th September, 1790), and was followed by the rest of the ministers, who were suspected of underhand communications with the *émigrés* at Coblentz. The king was deeply moved at finding a new ministry not of his own choosing; and finally, when the Assembly made its attack on the clergy, he ceased to feel a wish to keep terms with the Revolution. It must be stopped, either by combining against it all the moderates with the dissatisfied and alienated classes and their supporters, or by calling in the refugees from abroad with foreign help at their back.

The two courses before Louis XVI.

Between these two plans the king stupidly oscillated, in the end ruining both his friends and himself. Bouillé, Lafayette, the royalist deputies, the moderates in and out of the Assembly, desired the former course; the Austrian queen, the count of Artois, the emigrant nobles, who all lacked real patriotism and were half foreign, desired to be replaced by German bayonets. Louis, before the end of 1790, was in negotiation with almost all the kings of Europe; at the same time the queen, who hated Lafayette, kept the constitutional party at home at arm's length. She hoped to neutralize the movement at home, while she intrigued abroad, by winning Mirabeau, the terrible orator of the Assembly, in its earliest days the fearless champion who did not quail before the king or the king's servant, the revolutionary nobleman whom his own order had cast out; he might retain all his opinions, which were not republican, should be subsidized by the court, and should uphold the throne.

Mirabeau's position.

The suspicion and watchfulness of the Jacobins Club, and of the extremer party in the Assembly, did not hinder Mirabeau from openly doing his utmost to preserve portions of the royal authority; and when, early in 1791, he felt that he had some hold on the court, he advised the king to escape to Lyons, and there to establish himself as a mediator between the emigrants and the Assembly, to issue a constitution of his own, embodying the main principles of the Revolution, and appealing to the people to support him. In the midst, however, of these schemes, Mirabeau, worn out by his loose living and the excitement of his political life, suddenly fell ill and died, and with him perished all chance of a constitutional monarchy for France.

The king's flight.

His guiding hand gone, the king thought only how he might escape in safety, and eagerly adopted Bouillé's proposal that he should take refuge under the shelter of his army on the eastern frontier. It was obvious that this step, if successful, would bring him close to the *émigrés* and the German influence; if it failed, would make men regard him as a traitor. It failed. The court got out of Paris (20th June, 1791), and reached Varennes, not far from Verdun; there they were recognized, stopped, and sent back to Paris. Bouillé entered the place a very short time after they had left; found all the streets barred against him, and, comprehending that the game was lost, turned about and fled to the emigrants.

The Revolution triumphs.

The Assembly, at once and with calmness, assumed full direction of affairs; no disturbance followed. The king's return was a triumph of the revolutionary spirit, which showed itself all along his route. All firmly believed that his only wish had been to escape to the emigrants and to make open war on France. The clubs and the advanced section of the Assembly gained greatly in strength. Pétion and Robespierre now began their career as republican leaders. The excitement of Paris broke out in open fighting over the great petition of the clubs in the Champ de Mars for the deposition of the king; and Lafayette dispersed the republican crowd with vigorous bloodshed. The Assembly for the moment seemed to win strength by it; the country showed no wish to be rid of their king. The Jacobins had to draw back for a while; the division between Paris and the country, between the bourgeoisie and the bulk of the people, grew plainer; the Jacobins Club was almost deserted by the members of the Assembly; a new club, the Feuillants, was organized out of the more moderate section of the Jacobins, among whom were Lafayette, Bailly, the two Lameths, and others known as the representatives of the party which wished to unite the old monarchy with the new constitution.

The Feuillants Club.

The old Jacobins became absolutely republican, and, in contempt, called the Feuillants the "Club Monarchique." In these two clubs the new and clean-cut division of the country into monarchists and republicans was plainly to be seen.

The constitution completed.

The Assembly was now coming to the end of its labors; before finishing them, it made the grievous blunder of passing a "self-denying ordinance," and decreed that no member of its body should be eligible for the new Assembly to be at once elected, nor should accept any office under the crown. Lafayette and Bailly resigned their offices as general and mayor of Paris; every one of the men who had voted together in the tennis court, who had gained experience and insight into the proposed constitution, and might have worked it successfully, was rigorously excluded. The constitution was then laid before the king; he accepted it at once, and, going to the Assembly (14th September, 1791), swore that he would observe it faithfully.

Close of the Assembly.

Then, after decreeing a general amnesty for all political crimes and offences, the Assembly (30th September, 1791) closed its critical labors, and declared itself dissolved. As the members passed out of the chamber they held their heads high, in the belief that they had laid the firm foundations of a reasonable and constitutional government. The country welcomed the constitution with delight; a new era was about to begin; the middle classes were all in its favor, and believed that they had the future in their hands. The elections to the new Assembly, which took place before the Constituent dispersed, were loyally made; the middle party seemed to have a great majority; the king accepted the situation fairly. There were no representatives of the old régime in it to irritate men; violent republicans were few; it was thought that all promised well, and that the Legislative Assembly would have a long and peaceful life.

The Legislative Assembly and its parties.

The Legislative Assembly met on October 1, 1791; at once it shaped itself into parties, all more or less loyal to the new constitution. The "Extreme Right and the Right" (to the right, that is, of the president's chair) were usually called the Feuillants, were constitutionalists, who represented the burgher interests, and feared the people, and who wished to uphold the king as far as they could.

Girondists.

The "Left," the Girondists, was composed of men inclined towards a republic, also of the burgher class chiefly, also all devoted to the constitution as it stood; the "Extreme Left," which sat on the higher benches, and took the nickname of "the Mountain," was composed of popular delegates and representatives of the advanced clubs, with Robespierre as their out-of-doors leader at the Jacobins, and Danton at the Cordeliers Club.

The Mountain.

The Centre of the Assembly was timid, and wanting in any principle or clearness; it usually voted with the Left. Thus, the more extreme partisans, whether of royalty or republicanism, were not in the Assembly, but worked outside for their objects; it remained to be seen whether the moderate parties would succeed in holding their own.

The Pilnitz conventions.

The conventions of Pilnitz (27th August, 1791) had already shown the excluded royalists whither they might look for succor; Leopold of Austria and Frederick William of Prussia had then agreed, in vague terms, that they would invade France unless Louis XVI. were set free, the Assembly dissolved, the emigrants restored to their possessions and dignities. It was a challenge to Revolutionary France, and a temptation to the unstable king. At every step he and his friends blundered; a loyal acceptance of the constitution and the new Assembly seemed impossible; the royalists at home stirred up civil strife, especially through the clergy; abroad they threatened open war. The Assembly, backed by the new department of Paris, an organization given to the capital early in 1791, fought against the former; against the latter stood the army, mostly strong republicans, supported by the sympathy of the people generally, whose anger rose at threats of invasion.

The Assembly and its foes.

To meet its pressing dangers, the Assembly, in November, 1791, ordered the emigrants to return, on pain of confiscation of their property, and penalty of death. This decree the king at once vetoed, at the same time issuing a strong order to the emigrants to return. They refused to listen, and the popular feeling on the other hand was much excited by his interference in what seemed to be a matter of life and death to them. The Assembly next passed to attack those of the clergy who had not taken the oath, declaring that "refractory" priests should lose their pay, should be forbidden to perform divine service, should be put under surveillance. The king again exercised his veto: and those who supported the Revolution felt that in the two all-important matters—the threat of foreign war from the *émigrés*, and the threat of domestic war from the "refractory" clergy—Louis XVI.

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was against them, and with their enemies. They murmured the word "traitor."

The threat of invasion.

The Girondist ministry.

War declared against Austria.

After some hesitation the German princes began to show signs of movement; troops were raised by Austria, Prussia, Piedmont; the other monarchs of Europe threatened. France set on foot three armies,—one of the north under Rochambeau, one under Lafayette on the north-east, a third under Luckner on the Rhine as far as to Basel. The Montagnards alone, distrusting the officers and the king, opposed a declaration of war. All France suspected treason, and had only too good reason to think that the king's ministers, excepting Narbonne, minister of war, were in communication with the enemy. The feeling against the ministers was so strong that after the trial of one of them, known to be the queen's agent, they all resigned, and a Girondist cabinet was appointed by the king. Roland, a man of intelligence, spirit, and uprightness, married to the noblest lady of these troubled times,—a lady who was the inspiring genius of the Gironde,—was made minister of the interior. The other name of note was that of Dumouriez, who had the portfolio of foreign affairs. This ministry at once took up a resolute position against the allied sovereigns; and Francis II., the new head of the house of Austria, unlike Leopold, who had never wished for war, at once replied with defiance, ordering France to replace king, clergy, and nobles in their ancient dignities and privileges. On the 20th April, 1792, the Girondist ministry declared war against Francis, and the long wars of the republic and the empire began.

Campaign in Belgium.

The French army was in a state of great confusion; most of its officers had joined the emigrants, eager to show the Germans "the way to Paris;" those who remained were suspected by the people; there was little money in the treasury, little experience in the camp. Dumouriez hoped to make a good beginning by invading Belgium, restless under its Austrian masters, and only lately in revolt. All, however, went amiss. One column was checked near Tournay, lost its guns, killed Dillon its general, and fled with cries of "treason;" a second column was defeated near Mons; Lafayette and the other generals hereon halted and stood on the defensive. All France was uneasy. Had her ancient courage departed? was she powerless without her noble officers? or was she the victim of treachery? The Jacobins grew more vehement; the terrible voice of Marat was now heard calling for heads; suspicion became greater than ever against the king, above all against the Austrian queen, and the guards around them, who were thought to be inclined to betray the people. The Assembly declared itself as sitting in permanence. It levelled measures against the refractory priests; it declared that the king's guard should be dismissed, and that a camp of federal soldiers should be formed at Paris. The king refused to dismiss his guards; and on a strong remonstrance from Roland, he at once dismissed the three chief Girondist ministers. Dumouriez, finding the king obstinate, also resigned office. Louis named a ministry of obscure members of the Feuillant party,—men who believed in the constitution of 1790, and in the royal authority. It was at this time that he sent Mallet du Pan on a secret mission to Vienna, to pray the Germans to rescue him from the tyranny of those "who now ruled with a rod of iron."

Lafayette's position.

Insurrection of the 20th of June.

1792.

The court goes over to the emigrants.

The Girondists, thus ejected from power, made common cause with the Jacobins, and watched with keen eyes the course of Lafayette, the centre of the constitutional party; the ministry and all those who in heart loved the older system or dreaded the progress of the Revolution, looked to Lafayette and his army as their only hope. He was no statesman, loyal and upright as he was, and committed the great blunder of defying the Jacobins. At once his waning popularity was lost; his party was seen to be that of reaction; the people could see no difference between the constitutionalist Feuillants and the aristocrat emigrants, and the doom of the party was sealed. On the 20th of June, 1792, the Jacobins replied to Lafayette's manifesto by raising the Parisian populace against the Assembly. That body, overawed and powerless, could do nothing against so fierce and determined an invasion. They next forced their way into the palace, and there Louis XVI. met them with admirable dignity. The populace shouted "down with the veto," "recall the ministers," and so forth. The king wore the Paris red cap, and the crowd was appeased at once. It was an excited, not a bloodthirsty, mob that day. Louis assured them that "he would do whatever the constitution ordained that he should do,"—words which, though they meant little, yet when joined with the red cap and the king's manly bearing, satisfied the people, who departed quietly. Public opinion seemed at once to go with the monarch and the ministers against this outrage; the Girondists, who had been parties to it, lost ground; Lafayette even ventured to come up to Paris from the army to demand the punishment of the insurgent chiefs. His attempt, however, was a failure. The Assembly threatened to arrest him for leaving his troops without orders; the courtiers of the Tuileries looked coldly on him; the king gave him no thanks; as for the queen, she liked him no better than of old. He had to return quickly to the army. The truth was that at this time the court policy had gone entirely over to the emigrants and their foreign friends. There were 80,000 men at Coblentz commanded by the duke of Brunswick; the royalists cared nothing for such constitutionalists as Lafayette; "in a month I shall be free," was the queen's remark.

Insurrection of the 10th of August.

The *Marseillaise.*

The Paris commune.

Danton.

Robespierre.

Prussia had now also declared against France, and was on the march; this movement restored all power and popularity to the Jacobins. The Assembly took measures in self-defence against the court and the foreigners; men began to call for the deposition of the king; the country was proclaimed in danger, and 50,000 volunteers were decreed; men flocked to enroll themselves from every quarter; the excitement grew daily; the fiercest threats and suggestions made themselves heard. The Jacobins organized, almost openly, a new insurrection, which should force the hand of the Assembly, and "save the Revolution." The vanguard of the attack on the constitution was entrusted to the battalion of men of Marseilles, who have attached their name to the ever-famous song, which has been sung by Frenchmen on so many a hard-won battlefield, in politics or in campaign, the *Marseillaise.* The extravagant proclamation with which Brunswick heralded the opening of his campaign did but add to the fury of people; and on the 10th of August the great insurrection, led by the popular chief Danton, swept over the Assembly and the monarchy, overpowering everything as it passed along. The guards at the Tuileries were of uncertain fidelity to the king; the commissioners of the sections of Paris seized on the Hôtel de Ville, and at once set up an "insurrectionary commune;" they summoned before them the commandant of the national guard, Mandat, who was massacred as he left the hall. The guards, thus left headless, refused to fire on the people; the insurrection swept over all; the king with difficulty, surrounded by his family, took refuge under protection of the trembling Assembly. The Swiss guards of the palace were massacred, the Tuileries taken and sacked; the new municipality, flushed with victory, compelled the Assembly to confirm its powers; to order the election of a new National Convention; to declare the king suspended provisionally, and placed at the Luxembourg under civic guard; to dismiss the ministers; to make into law the decrees passed but vetoed by the king. The Assembly was crushed, the royal family prisoners in the Temple; the Paris people, under inspiration of Robespierre and Danton, were omnipotent. Forthwith began the terrible scenes of the prisons, the mockery of trial, the massacre of the "killers at six francs a day." It was clear that the new commune of Paris was now the sovereign power in France; it established a committee of surveillance, and swept away all the older administration of Paris. Danton, burly representative of popular passions, and of popular kindness also, was the leading spirit of the time. He was no statesman, and had little chance of permanent power, when pitted against the virtuous, the incorruptible Robespierre, who had kept sedulously clear of the insurrection, and was already planning how he might rise by it to the top of his ambition. Danton with all his roughnesses was a man; Robespierre was a vain fop. Danton had comparatively little personal ambition; Robespierre always thought first of himself, and intended to become the dicta-

1792.

Marat.

tor of a new commonwealth. Marat, who must be named here, was the leading spirit of the committee of surveillance, the leader and instigator of all the bloodshed of the Reign of Terror. He wished, too, to be dictator, that he might purify society,—that he might have in his power the sole and unquestioned right to slay.

The invasion.

Lafayette, in spite of the invasion, would have marched on Paris to save society. He found himself abandoned, and took to flight; the Germans, to whom he went, imprisoned him and treated him ill. Meanwhile, the allies took Longwy and Verdun, while they besieged Thionville; the road to Paris seemed quite free to them. The effect on Paris was terrible; no one knew who was in communication with the foreigners; fear and anger made men brutal; the massacres in the prisons went on incessantly. Danton, "fiercely as he might bellow, was ashamed, for he had a human heart; and he delivered from the fury as many of the victims as he could." Meanwhile, the Prussians had forced their way into France through the Argonne, in spite of Dumouriez; and the duke of Brunswick, who hoped to cut him off, and had abandoned the direct road for Paris through Chalons, was met by Kellermann who lay in his path at Valmy. The spirit which Kellermann infused into his raw troops staggered the assailants, who hesitated and drew back. The cannonade of Valmy, for it was little more, was more to France than many a great victory; the Germans had to fall back discomfited; the siege of Thionville was raised. By the 1st of October not one of them remained in France. Unfortunately, no steps were taken to harass them in the retreat; their state was so bad that a little vigor might have entirely ruined them. Shortly afterwards came news to Paris that the army of Alsace under Custine had taken Worms, Spires, and Mainz, where lay the chief magazines of the allies; in the north an attack on Lille was repulsed. Savoy was occupied by French troops, who also seized on the coast line, and occupied Nice and Villafranca, with its great munitions of war. Abroad the Revolution showed itself proud and defiant; at home the National Convention replaced the Legislative Assembly.

V. THE REPUBLIC.

The National Convention: parties in it.

Abolition of royalty.

The trial and execution of Louis XVI.

1793.

The new government of France reflected the changes which had taken place. Paris sent the chief Jacobins to it; the Girondists sat on the right and had a large majority; the Jacobins on the left, high up, with the *sobriquet* of the Mountain; below sat the "Plain" and the "Marsh," the timid moderates, who leant towards the Girondists. Paris was behind all, fierce and bloodstained, supporting the Jacobins. At once the Convention decreed (21st September, 1792) the abolition of royalty in France, and proclaimed the Republic. The 22d of September, 1792, is the "First day of year I. of the Republic." Roland, the most influential of the Girondists, retained office as minister of the interior; and his party, encouraged by the protests of the permanent department of Paris, which felt itself set aside, attacked the anarchy of the capital and the Jacobins. Robespierre was denounced, and great debates ensued; the Girondists, however, in spite of their majority in the Convention, had no force, and little political sagacity. Paris was in no mood for submission to the more moderate and constitutional friends of the republic; before the end of 1792 the commune, and the Mountain with it, had defeated the Gironde, the executive power, and Roland himself. For a time, however, the trial of the king absorbed all attention. It had begun in November, 1792; in December Louis had been questioned by the Convention; all France discussed with vehemence the different views as to the method of the trial. Who should judge him? The parties here split; the Gironde, anxious to gain time, and to save the king from death, and the country from a great blunder, called for an appeal to the sovereign people; they still clung to constitutional forms. The Mountain held that the Convention was competent to undertake the task of an immediate trial. The opinion of the country re-echoed the cries of Paris; and the Convention, on the 15th, 16th, and 17th January, 1793, took on itself to decide the question; by a majority of a few votes (387 against 334) it decreed that the king's punishment should be death. Philip Égalité, his nearest kinsman, was one of those who voted with the majority, to the disgrace of his name; even those who wished for the king's death despised and condemned him for an act dictated by weak ambition and cowardice. On the 21st of January, 1793, Louis XVI. was executed on the Square of the Revolution.

Robespierre's rise.

By this act, as the Montagnards themselves said, "the Revolution threw down the glove to all ancient Europe." They had accused their rivals the Girondists of intriguing to save the monarchy, of coquetting with the emigrants and the foreign sovereigns. The Girondists, in their turn, accused them of being "anarchists sold to the foreigner," men who were treacherously pushing on the Revolution to excess in order to discredit it, and to bring in the foreign help which the court desired; men who were in the pay of Pitt, the supposed Macchiavelli of the time, whose hand was believed to be in everything which could turn to the harm of France. If Henry IV. was the hero of the Revolution, Pitt was its bugbear; Frenchmen were scared in those days by his name, just as twenty years later Englishmen were scared by the name of Napoleon. The truth is that the Girondists represented the burgher classes, and were honestly eager to establish the new constitution in all its parts; they were on the defensive, while the Mountain, the party of offence, represented the suffering populace—eager, defiant, weary of negotiation, suspicious of treason at every point, and zealously determined to push the principles of the Revolution to their limits. In this they were utterly careless of political considerations, eager for war, come what might, quite honest and narrow,—a very dangerous and powerful party. Their victory in the trial and execution of "Louis Capet" was complete; it brought with it inevitably the fall of Roland. When Robespierre and Danton attacked him in the Convention, finding that the Girondists no longer had a majority, he laid with dignity his resignation before the Convention, and was replaced for the time by the indolent and philosophic Garat, the minister of justice. The ascendency of Robespierre was assured—the man to whom the Revolution, as his enemies said, "was the religion of which he was the priest." "Robespierre preaches, Robespierre censures, thunders against the rich and great, lives simply, has no physical passions, has created for himself a reputation for austerity—the austerity of a saint. He speaks of God and Providence, calls himself the friend of the poor and feeble, is followed by the women and the weak, whose adoration and homage he solemnly accepts." This is the dangerous man in whose hands lay the fortunes of France throughout the dark days of the Terror. He was the prophet who should realize on earth the beautiful and popular dreams of the *Contrat Social*.

Conquest of Belgium.

Foreign relations of France.

After the withdrawal of the Germans from France at the end of the previous September, Dumouriez had easily persuaded the Executive Council at Paris that, by seizing the moment of amazement and disquiet, the French armies might secure for France her "natural frontiers,"—that is, might become masters of the whole left bank of the Rhine from Basel to the sea. Custine and Kellermann should master the middle Rhine at Coblentz, and Dumouriez should invade Belgium. He set out at once, and on November 6, 1792, by winning the battle of Jemmapes, roused the amazement of all Europe. It is true that the French were two to one, yet so low had their reputation for fighting-power fallen, that the courage they showed on the field took men by surprise. The Austrians fell back, and Dumouriez occupied all Belgium down to the Meuse. The Scheldt, which had been closed since 1648, thanks to the jealousy of England and Holland, was reopened; Antwerp and all Belgium regarded the French as their deliverers, and a Belgian republic, in which the clergy took the lead, was formed at once. Dumouriez, poorly seconded by the other armies, and ill-provided from France, could push the Austrians no further than Aix-la-Chapelle; Custine, who had occupied Frankfort, and thereby forced the German diet to declare war on France, was driven out of that place, and could scarcely hold his own on the Rhine. While France was laying her hand on monarchy at home, she challenged at the same moment the hostility of Europe, by this conquest of Belgium, and by the declaration of a crusade by the army against all its ancient institutions. The army began henceforth to regard itself as a great republican propaganda; it was by using this belief that Napoleon eventually worked his will on France.

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The position of England.

This development of a warlike tendency in the republic, coupled with the fall of the king, decided the policy of England, which hitherto had shown some sympathy with France. The ferment of opinion in England, roused by the revolutionary movement and republican ideas, was much stilled by the news of the death of Louis XVI.; and Pitt with great ability both used the feeling in favor of the Tory Government at home and tempted the French ministers to declare war against England (1st February, 1793). Pitt at once proclaimed it, by a happy phrase, to be "the war of armed opinions," and drew tighter his friendly relations with the European courts. All ancient lines of policy were entirely obliterated by the new phenomenon. Spain and Portugal agreed; Austria ceased to be jealous of Prussia; Russia and Prussia found the moment good for a farther partition of Poland; the only neutral powers remaining in Europe were Sweden and Denmark, Switzerland, Venice, and Turkey.

France defies the world.

The Mountain did not quail before so great a display of force. "France shall be an armed camp," and every Frenchman a soldier; "conquer or die," the watchword of a united people; the "principles of the Revolution" a new religion for which men of good will should devote themselves. The enthusiasm was great; a levy of 300,000 men was voted at once; the revolutionary propaganda filled Belgium, and alienated the friendly feeling there by its violence. They had also ruined Dumouriez's plans, and he, with an ill-equipped army, and feeling that hostility was rising against him in Paris, set himself to recover ground by a bold attempt to conquer Holland. He was caught by the prince of Coburg at Neerwinden, and defeated after a vehement battle (18th March, 1793).

Dumouriez's plans.

Then, as a last step, Dumouriez came secretly to terms with the Austrians, agreed to evacuate Belgium, and carrying with him the young duke of Chartres, who had shown great gallantry and ability in the face of the enemy, marched for the French frontier, intending to restore the constitution of 1791, to secure the Girondists, overthrow the Jacobins, and proclaim the duke as constitutional king of France. In Paris, the struggle between the parties in the spring of 1793 was acute and close. The news of the disaster of Neerwinden and the march of Dumouriez for Paris aroused all the fury of the Jacobins; the Girondists, with horror, saw themselves innocently implicated in a counter-revolutionary scheme, carried out lightly and suddenly by a general whom they did not trust.

The Committee of Public Safety.

The Jacobins at once took the ascendant, proposed the creation of the terrible Committee of Public Safety, summoned Dumouriez to the bar of the Convention, and sent off four deputies and the minister of war to him. When they came he seized them, sent them over the frontier to the Austrians, and openly proclaimed his objects. His regular troops might have supported him; the volunteers, full of Jacobin ideas, rose on him, and compelled him to take refuge, with the Orleans princes and a handful of soldiers, within the Austrian lines. It was clear enough that the Jacobins would assume that he and the princes had had throughout an understanding with the Gironde. The Convention in alarm decreed that its own members should not be inviolable, but might be arrested on suspicion of treason; that the Orleans family should be sent to Marseilles; that three representatives should be sent to look after each army. The Committee of Public Safety was now formed of nine members re-elected monthly, as a secret spring to push the whole machine forwards without being seen. It was an ominous fact that not one of the nine representatives who formed it was a Girondist. They had still a majority in the Convention; it was all they had. Matters moved on fast; Paris, the commune, the ministers, the army, were all against them; in the country they had no adherents in the east and north-east of France; for the nearer Germany the stronger the Jacobin feeling. In the south-east royalist sentiments were still powerful, though for a time concealed.

Insurrection in La Vendée.

Their headquarters were at Lyons, and violent and bloody disturbances had already occurred there; in the west, in Brittany, Poitou, and Anjou, the royalist feeling was stronger still, and broke out, on the 10th March, 1793, in the terrible Vendean insurrection on behalf of the white flag and the refractory priesthood. The Girondists had their strength in the south-west, with Bordeaux for their headquarters; the Normans and Picards, on the whole, supported the constitution of 1791, and thus could go with the Girondists.

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At the beginning the Vendeans carried all before them, and in fanatical enthusiasm sullied each advantage they gained by horrible massacres, by shooting their prisoners in cold blood, pillaging towns, burning villages, maltreating the defenceless. The civil war from the beginning took a fierce color—a color given it by the royalists. The Girondists also in the south threatened to march on Paris to put down the Jacobins. The allied powers, however, instead of closing in resolutely on France at her weakest, saved her by their long discussions as to what each of them was to take rather than what each was to undertake. At last they moved forwards in the north; Austrians, Dutchmen, and English, under Cobourg and the duke of York, slowly drove back the army of the north, which unfortunately lost its commander Dampierre, who was skilfully reviving its confidence, and besieged Valenciennes. The king of Prussia blockaded Mainz; in the other scenes of war the French were too weak to do anything, and suffered losses and defeats. The struggle of Girondists and Montagnards went on all the same; it was the gloomiest moment of the history of the Revolution. In May a Committee of Twelve was appointed by the moderate party of the Convention, at the suggestion of Barrère, a moderate who had the confidence of more extreme men. It was composed of Girondists. Over against this move the sections of Paris established their Central Revolutionary Committee. On the 31st of May, guided by Danton, Paris rose against the Convention, and compelled it to suppress the Committee of Twelve.

Fall of the Girondists.

Marat at the head of his sans-culottes, supported by the minority of the representatives, the Mountain, on the 2d of June overthrew the Girondists, arresting two of the ministers and thirty-one deputies. More than half the departments rose to defend the defeated party; in the Cevennes the white flag was unfurled, and the emigrants began to stream back into France. "On the one side was Europe with three-fourths of France; on the other side Paris with a few departments" (La Vallée). The position of things might well have seemed desperate for the Mountain, had there been any strong man, any true head, to direct the attack on them. But they had unity, energy, devotion to their principles, the main part of the army at their back; while their antagonists were divided in views and principles, and were in confusion. Danton, who in fact carried his party through the crisis, showed real power and energy. Under his direction the Convention proclaimed martial law in the hostile departments, called up the army, as far as possible, to the capital, and in eight days constructed a new constitution, that of the year I.—simple, thoroughly democratic. It never was really acted on; men were too busy to care about constitutions. The assassination of Marat by Charlotte Corday, which occurred at this moment, inflamed men's minds still more against the Girondists; she had come from Caen, one of their towns, and was thought to agree with them. The first active measures taken by the Jacobins showed that the Girondists were powerless; Paris and the army were at once triumphant, and by the beginning of August the Girondists were crushed.

Elsewhere things looked very dark: Toulon fell into English hands; La Vendée remained unsubdued, and defeated the incompetent officers sent to reduce it; Mainz and Valenciennes fell; all France was vexed with famine, and the assignat-system had utterly paralyzed commerce. The republic, however, was full of energy. After the fête of the 10th of August, with its statues of Nature and Reason, its classical and pagan affectations, and those light frivolities which were natural to Paris even in the darkest days, men turned at once to the ever-recurring question, how the republic should be saved. The convention decreed a *levée en masse* to resist the invader and to keep down the ill-affected at home; to the Committee of Public Safety was entrusted the real government of the country; the new constitution was not to be introduced till peaceful days came round.

The republican calendar.

The overthrow of all things old was further indicated by the issue, on 24th November, 1793, of the new republican calendar. Year I. was fixed to have begun on the 22d of September, 1792, the date of the proclamation of the Republic. The new year should have twelve months like its predecessors, each with a new name, in four groups

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of three; each of 30 days, and each divided into three decades, of which the tenth days should be days of rest, in lieu of the old exploded Sunday. These 12 months of 30 days a piece, cutting across the old months so awkwardly, only made up 360 days; so that a little bundle of 5 days (in leap years of 6) had to be tacked on at the end of the Fructidor month (August-September) in an awkward and shapeless way, and called, poor things, the *Sans-culottides*. Such interferences with symmetry will nature cause, when she sets herself against the spirit of system, and the advance of enlightenment. Attempts were also made at this time to grapple with the confusion in the currency and the crushing deficit; the mass of assignats was reduced by more than a half; a maximum price was set on the necessaries of life; trade also had to bow to the will of the Revolution.

War in 1793.

In the affairs of war the new life of the Revolution found expression in the vigorous plans of Carnot, an engineer officer, who saw the truth of the principle afterwards acted on by Napoleon, that "God aids the big battalions." "Attack in mass, and cover the want of discipline and skill by numbers and enthusiasm,"—this was the new order. For neglecting this Houchard was deprived of command in the north, and had to give place to Jourdan, who, helped by Carnot himself, defeated Coburg at Wattignies (16th Oct., 1793); on the Rhine the battle of Pirmasens was lost (13th October), and the allies occupied Hagenau and Fort-Vauban; they threatened Landau, and had friends in Strasburg. Hoche was then set down to the army of the Moselle, and Pichegru to that of the Rhine. The former, after a series of rather unsuccessful battles against the duke of Brunswick, in which he failed to relieve Landau, suddenly left his adversary, and, in concert with Pichegru, cleared the Vosges, and brilliantly stormed the Wissemburg lines. The Austrians at the end of the year had raised the siege of Landau, and were across the Rhine; the Prussians took winter-quarters at Mainz; the French lay in the Palatinate. In the south also things went better with the new Government; Lyons and Toulon were retaken, though on the slopes of the Pyrenees the Spaniards forced the French to take refuge under the walls of Perpignan.

Close of the war in La Vendée.

In the Vendée the terrible civil war still raged; the peasants, point after point, defeated the isolated columns of the army. A more coherent plan of action, however, gave the victory at Châtillon (16th October, 1793) to the Republicans; then the Vendeans crossed the Loire, and defeated Lechelle near Laval. They next attacked Cherbourg, meaning to make it their point of union with the English; here, however, they were manfully withstood, and, incapable of siege-operations, withdrew. On their return they defeated Rossignol and made a push for Angers, meaning there to recross the Loire to the left bank. Westermann and Kléber drove them thence with loss, and with Marceau pursued them to Le Mans, where, after a terrible battle in the streets, in which no quarter was given or taken, the Vendeans were utterly defeated. Westermann pressed on their heels with pitiless vigor; caught at last between the Loire and the Republicans, they were finally defeated (23d December, 1793). Thenceforward they ceased to be formidable, though still troublesome at times.

So ended 1793, with fortunes, on the whole, very favorable to the French army, and very fatal to the Girondists. Meanwhile, the Reign of Terror had begun at Paris; the queen, the leading Girondists, all who were "aristocrats" or "ci-devants," as the phrases of the day called them, Philip Égalité, and a crowd of others, passed under the guillotine. In La Vendée, the revolutionary fury, goaded by the blood shed by its opponents, spared none it suspected. From Toulon most of the inhabitants had fled for refuge to the English ships; at Lyons the Convention ordered the destruction of the city, and the establishment of a new town to be called "Commune Affranchie;" many hundreds of the citizens were guillotined, and when that process proved too slow, were shot down by platoon fire.

Hebertists and Dantonists.

Two parties were now to be discerned in opposition to the rule of the Committee of Public Safety,—the *Exagérés*, or Hebertists, so named from their leader Hebert, the party of terror and reckless bloodshed; and the *Modérés*, the Dantonists, who tried to calm men's minds, and lessen the atrocities of the time. The Hebertists were the stronger party; they abolished the Catholic worship, swept away the past, set up a goddess of Reason, and professed atheism. The party of Robespierre in the Committee disliked both the indulgent and the savage sections. Early in 1794 the Hebertists were seized and condemned to death; it was a first victory of the Government over the violent party. Had Robespierre been willing to ally himself with Danton, a stable rule, at least for a while, would have been possible. But he refused: he was not a person to brook a manly rival at his side; and Danton, with his party, fell victims to the ambition of the ascetic and heartless Robespierre. "If my friend is culpable, I will sacrifice him to the Republic," was his phrase,—had he said "to myself," he would have hit the truth. Then Robespierre became for a while a dictator; all France bowed before him; the revolutionary spirit in the eleven armies on foot was on his side. The campaigns of 1794 proved glorious for them; the battle of Fleurus (26th June) won for them the second conquest of Belgium; in the Pyrenees the French stormed the Spanish camp at Ceret, and threatened Catalonia; in Italy, where young Bonaparte commanded the artillery, they swept the Piedmontese out of their camp at Saorgio, and got the command of all the strong points along the Alps. It was only on the sea that the French armies failed; Corsica was taken, and Howe defeated the squadron in charge of a corn-fleet from San Domingo.

1794.

Robespierre's rule.

The Great Terror.

Robespierre's fall.

In the midst of his foreign cares Robespierre also busied himself with the exposition of his ideas. Those whom he had destroyed, Hebertists and Dantonists, had been anarchic and atheist; he, pale reflex of Rousseau, would bring back the reign of virtue and the love of God. He desired to be at once high priest and dictator of a regenerated France. To this end he passed a decree recognizing the Supreme Being and declaring that the soul is immortal. His admirers at once hailed him as a great prophet; the emotion throughout the country was great. On the 8th of June, 1794, he took the lead in the great fête of the Supreme Being, which amused and offended many of his old friends. Finding himself far from being admired by them, he determined that the Terror, which he had in some ways mitigated, should go on again; the Convention, however, resisted, and he withdrew completely from public life, giving his enemies the opportunity of strengthening themselves against him. At the same time he left the reins of power in the hands of his terrible colleagues, who at once applied with the utmost ferocity the law by which suspected persons could be put to death with but the shadow of a trial. This was the time of what is called the Great Terror, June and July, 1794. The reaction soon came; in spite of his friends and the power of the Jacobins, he had arrayed against him the majority of the Committees, and almost all the old Montagnards; his pride and vanity, the fête and his conduct of it, their fears of a dictator, their fear for their own heads, all undermined his position. Before long the struggle began. Robespierre was no Marat; he would not strike a crushing blow, and "making solitude, call it peace." He trusted too much to the strength of his ideas, the influence of his party; and on the 27th of July, 1794 (the 9th Thermidor), it came to an explosion in the Convention. Permanence was voted, the arrest of Robespierre and his chief supporters was agreed to; a proclamation to the people was issued; five members of the Convention were carried off to prison. Instantly, the commune of Paris declared itself in insurrection, the tocsin was rung, and the five deputies were at once rescued from the jailer's hands, and carried in triumph to the Hôtel de Ville. Two hundred cannoniers marched on the Tuileries, where the Convention was sitting, and all seemed over there. But the artillerymen were not firm; when the deputies talked to them, they hesitated, and that hesitation was fatal to Robespierre; for those sections of Paris which hated him had also put themselves in motion to defend the Convention; indecision fell on the Jacobins, their forces melted away, and the resistance came to an end. Robespierre tried to shoot himself, and shattered his lower jaw; he and his friends were again arrested, and perished the next day on the scaffold. And thus ended the early history of the French Revolution. From the proclamation of the Republic to the days of the Legislative Assembly, from the overthrow of their power to the death of the king, thence to the fall of the Girondists, then to the death of Hebert and Danton, now to the failure of Robespierre's bloodstained Utopia,—thus had the Revo-

1794-1795.

The future of the army.

lution moved onwards, violent, yet often generous, proudly patriotic, yet destructive of all the stability of the country. There remained but the army. The army was heartily republican, and had suffered enough and triumphed enough to have a high idea of its own organization and its worth. When a man comes to lead it, the army will set itself to organize France into an instrument of tremendous power; a despotism, solid and strong, aggressive abroad, vigorous at home, using all the terms and calls of the Revolution, will take the place of the ill-fated men who have hitherto tried to guide the destinies of the country. It will call itself an empire; it will be a despot ruling with the liberal ideas and phrases.

The reaction on Robespierre's death.

Meanwhile, as Mr. Carlyle says, "here was the end not of Robespierre only, but of the Revolution-system itself," for his death was the signal of a great revulsion of feeling. France, so gay and light of heart, had lived an unnatural life under the preachings of this virtuous dictator; she was weary of the gloom and burden of a system which crushed out gayety, made wealth a crime, and pleasure impossible; and public opinion hailed with joy the tidings that the régime of virtue and the guillotine was over. The Terror was past; the committees which had destroyed Robespierre perished with his death; the "Thermidorians," the Mountain, who had caused this revolution, became a reactionary party, sitting on the right, and remodelling, if not overthrowing, the existing government. The prisons were emptied, the terrible cruelties of Nantes stopped; amnesty was offered to the rebels; the sections of Paris were reduced in importance, the administration of the capital reorganized. All the parties in hiding came forth; the Girondists returned; society began once more to dance and glitter; it was like the temper of England after the return of Charles II. In January, 1795, the Convention closed the Jacobins Club; the agents who had carried out the inhuman orders of the past were put to death.

Close of the Jacobins Club.

The war abroad.

The armies, which by no means sympathized with the movement of affairs at home, still pursued in the autumn and winter of 1794 a brilliant career under Pichegru in the north, Jourdan on the Sambre and Meuse, and other generals for the Moselle and the Rhine. The whole course of the Rhine from Basel to the sea was in their hands; and the winter campaign, in which Pichegru conquered Holland, raised the fame of the commander and of his troops to the highest point. Pichegru had done what Louis XIV. had failed to do; 1795 wiped out the discredit of 1672; Holland and Belgium were to become republics on the French model; the Amsterdam populace welcomed the French as brethren. The capture of the Dutch fleet at the Texel by hussars, who stormed it on horseback, riding across the ice, seemed to the French people to realize a tale of fairyland. At home, too, the suppression of the Chouans, those Breton peasants who, taking advantage of the troubles, plied the trade of brigands and highway robbers, added to the general content. The Vendeans struggled still; their country was a scene of desolation, and the central authority had to recall their barbarous agents, and to try to reduce the district to peace by way of conciliation.

Things look brighter for France.

So ended the year 1794, which saw the reaction set in at Paris, and saw, too, the Revolution triumphant on every frontier, and the area of its influence extended widely. The coalition against France showed signs of breaking; the Dutch made peace, ceding northern Flanders with other districts to France; the king of Prussia also abandoned the coalition, ceding to France the left bank of the Rhine; the Bourbon king of Spain next abandoned "the cause of all kings;" the little states of Germany followed; Portugal made advances in the same direction, as did Naples, the papacy, and other Italian powers. England and Austria alone stood firm against the new ideas, and Pitt, though he could not hope to direct, or have to pay, half Europe, still felt strong enough to carry on the war.

Disturbances in Paris.

Paris, where famine raged unchecked, was still uneasy and dissatisfied with the new Government. Men who knew how to excite the populace to fury told them that the scarcity was factitious; and they broke out into insurrection on the 1st of April, and again on the 20th of May. On each occasion the disturbance was easily put down. The multitude was thus completely overthrown, and the guidance of affairs lay entirely with the middle classes; the reign of wealth and comfort was what men longed for; it was in sharp contrast with the general distress and suffering of the people, and provoked vain contests and bloodshed. The royalists thought that their time was come; and in a large part of the south of France they rose, and pitilessly massacred their political opponents. The murders committed by them far exceeded in indiscriminate butchery and savageness even the brutal bloodshed which had defiled the progress of the Revolution. Throughout 1795 the efforts of the armies of France were languid—there was a feeling of uncertainty; the troops were firm to the republic, but it was not clear that the generals were so as well. Pichegru paralyzed the army of the Rhine, as well as Jourdan's army of the Sambre and Meuse, and ended the year by making an armistice with the Austrians, after which he was recalled and deprived of his command. The English armament, destined to rekindle the troubles of Brittany and La Vendée, failed wretchedly at Quiberon Bay; the genius of Hoche crushed it in the outset, and captured a large number of royalists. The central Government sent him orders to destroy them all. He shot 711 émigrés. And Charette on the other side, to be at least even with him, murdered in cold blood 2000 republican prisoners in his hands.

1795.

Troubles in the west.

Constitution of the year III.

The Constitution of the year III. now appeared, the work of the restored Girondists. It was republican, of a modified type; it entrusted legislation to two councils, the council of the Ancients, 250 persons of forty years of age and upwards, a kind of senate, who sanctioned the laws (or, to put it the other way, had the veto-power); and the council of Five Hundred, men at least thirty years old, who had the preparation and initiation in law-making. The executive power was entrusted to a Directory of five members, under whom should be responsible ministers, and all the machinery of practical government. The general principles of the rights of man were reaffirmed. The Convention at once accepted it, only taking care that the royalists should not be able to get hold of power by means of it. The country generally adopted the new constitution, which seemed likely to be moderate and stable. The royalists made one determined effort (5th October, 1795), to overthrow it; the fighting was severe, and for a time Paris seemed likely to accept a counter-revolution. The energy of Bonaparte, who had been set aside because of his Jacobin opinions, but was now recalled by Barras, swept away the insurrection; Bonaparte had guns, he was a great artillery officer already, and the loose resistance of the royalists was vain against his skill and iron resolution. The elections, which took place this same month, being over, the Convention, as a last and, for the time, a very significant act, decreed the abolition of the punishment of death, and then declared its mission ended, and so ceased to exist.

Bonaparte crushes the royalists.

The army had saved the Convention; it had set a new man forward; and he, for all his faults, a great man and a true ruler, became after a short time the central figure of all Europe.

Earlier history of Napoleon Bonaparte.

Napoleon Bonaparte was born in Corsica, on the 15th August, 1769, just two months after the patriot Paoli had been obliged to cede that island to France. His was a dark and thoughtful boyhood. He loved history, above all the history of great men in the republics of antiquity. He read with eagerness both Cæsar's *Commentaries* and, like so many other great men, Plutarch's *Lives*. The French tongue was a foreign language to the boy; he learnt it late, and never altogether mastered it. In 1785 he was at the military school at Paris, where he learnt to grumble at and to criticise the ancient régime; in the next year he entered the army. When the Revolution began he declared warmly for it, though at first his ambition seemed rather to point to a career in Corsica than to one in France. When Paoli ejected him thence in 1792, he settled, first at Nice, then at Marseilles, with his mother and sisters, who had gone from Corsica with him. In 1793 he became captain of artillery, and was charged to put down the Marseilles federalists; this successfully accomplished, he was made adjutant-general at the siege of Toulon, and by storming the Éguillette fort, secured the fall of the town. He was at once, at the

1794-1795.

age of twenty-four, named a brigadier-general, and, after arming the Provençal shores against English attacks, was sent to command the artillery (in 1794) in Italy. Here his vigor, amazing power of organization, and genius in war gave a new turn to affairs, and secured the brilliant success of the campaign, which, in about a month's time, made France the mistress of the Alps. This triumph made Bonaparte a great favorite with the Robespierres, especially with the younger brother, who had at this moment the charge of the army of Italy; and the young general, without believing much in them, echoed the high-flown sentiments of his chiefs, accepted, with contempt, their opinions, while, as far as he dared, to his honor be it said, he sheltered those who in Italy were obnoxious to their vengeance. In after life he always shunned reference to this period of his career, and his connection with the brief ascendency of Rousseau's reign of virtue as expounded by Robespierre. At the time he saw that it would not last, and tried his best to avoid compromising himself. He got his reward; when Robespierre fell, though he was arrested, and had a narrow escape, his prudence had kept him sufficiently clear of the fallen leader to save him. For a time he was in disgrace, and with other officers of the army of Italy was suspected of strong Jacobin tendencies. When, however, Barras, in October, 1795, needed a vigorous artillery-officer for the streets of Paris, he found one in Bonaparte, whom Pontécoulant, with a clear sight which does him great credit, had made president of the "topographical cabinet." For Bonaparte, not being a real Frenchman, knew the value of geography, and understood how to use a map. The remarkable skill and energy with which the young general crushed the Vendémiaire insurrection secured his fortunes; with the army he had defeated Paris. He was made general of division and commander-in-chief of the army of the interior at the age of twenty-six. The event "showed the world," says Lanfrey, "what can be the weight of a soldier's sword in the balance; from this inauspicious day power learnt to reckon on the army, the army to dispose of power; the path towards a military government was now open."

The Directory.

First, however, the Directory must have its course. The Legislative Assembly, with seemingly the fairest prospects, had lasted less than a year. The National Convention saw the fall of the Girondists, then of Hebert and Danton, lastly of Robespierre, and existed three clear years. The Directory, which came into office with a new constitution on October 28, 1795, had before it no less than four years of power. And yet at first, so far as could be seen, its chances were bad. The five directors, with exception of Barras, who was a noble, and suspected of reactionary leanings, were honest republicans, and men of character; they set themselves to allay the commercial and popular misery of the country, by absorbing a large portion of the assignats, and then by replacing them with "territorial mandates," which represented a fixed amount of public lands; a considerable amount of coin came again into circulation, and credit seemed to revive. They also abolished the commune of Paris, created an army for the "interior," and established guards for the public service. Stability seemed to return; men were weary of the agitations of late years; the famine also abated, so as to render Paris less difficult of management. It was felt that the Government was in a way provisional, that France had need of repose, and as usually happens, indifference succeeded as a reaction from the heroic measures of the past. The councils of the Ancients and of the Five Hundred were one-third new; and the elections had shown that the country was weary of the Revolution, and desired a return to a constitution, and perhaps even to a monarchy. The bourgeoisie of France were the strength of this movement. The republican party, which had offended Paris, and refused to ally itself with the doings of the Jacobins, seemed weak, and was obliged to stand on the defensive. The royalists, to whom had rallied many of the old Girondists, were able to pass more than one decree in favor of their views. Had there been a prince of any resolution at their head, their chances would have been good; as it was, the count of Provence, who in this year was recognized by the crowned heads as Louis XVIII. on the death of his nephew, the dauphin (the titular Louis XVII.), was an intelligent and liberal person, but wanting in power, while his brother the count of Artois (afterwards Charles X.), whom he now named lieutenant-general of the realm, was a miserable and narrow creature, of good manners and bad morals, incapable of any worthy or heroic effort.

1796.

When the Vendeans and Bretons were eager to revolt again, and Charette had prepared everything, the count of Artois could not even be persuaded to land; he returned to England, discredited and despised. The fierce outbreak of despair with which Charette signalized his disappointment and anger was soon mastered by the devotion and genius of Hoche, who circled round the revolted districts, gradually hemmed in the insurgents, and eventually took and shot the desperate chieftain himself. His comrade Stofflet had perished a month before. By April, 1796, the west was completely pacified, and 80,000 of the best soldiers of France were free for foreign service. At the other extreme, the former "Terrorists" formed a great secret society called the Conspiracy of Babeuf; their plans were betrayed to the Directory, and the movement easily crushed; the Government used no vengeance; only Babeuf and one comrade were executed.

Conspiracy of Babeuf.

These things gave stability and confidence to the new administration; it seemed to win the good-will of all except the extreme parties; there was a distinct lull in political passion; and as the Directory proved very enterprising and warlike in foreign affairs, it also secured the army. This was in large part due to the military genius and temper of Carnot, "the organizer of victory," who was one of the Five. He now planned a grand attack on Austria, feeling that the hostility of England might for the moment be neglected. Three armies, led by three young generals, were to make their way in harmony towards Vienna, one under Jourdan, the army of the Sambre and Meuse, the second under Moreau, that of the Rhine and Moselle, the third under Bonaparte, the army of Italy. This army, hitherto commanded by Scherer, who had under him Serrurier, Masséna, and Augereau, had not been inactive in 1794 and 1795. Scherer, however, had no enterprise in him, and was content with partial success; his army lay scattered along the Alps, and he seemed powerless to draw it together so as to crush either Piedmontese or Austrians; the army also was not powerful in numbers, though its quality was very good. Bonaparte, on his arrival to take the command, at once addressed them in the tone of a confident adventurer speaking to hungry mercenaries: "I am going to lead you into the richest plains on earth;—there you will find honor, glory, and wealth." Splendidly seconded by Masséna, La Harpe, and Augereau, he at once took the ascendant, and placed his victorious army between the Piedmontese and the Austrians. By a successson of rapid victories he forced the Turin court to sue for an armistice (28th April, 1796), securing the neutrality of the Sardinian and Savoyard troops, and the cession of Nice and Savoy to France at the end of the war. Then with the swiftness of an eagle he crossed the Po, won the hard-fought battle of Lodi (10th May, 1796), and entered Milan in triumph. There he re-equipped and rested his army, made terms with the dukes of Parma and Modena, raised a contribution of twenty million francs on Lombardy, the half of which, with some of the masterpieces of Italian art, he sent at once to Paris to the Directory, which received his favors with a gratitude which trembled on the verge of jealousy. When they proposed to interfere with him, he threatened to throw up his command; and so marked already was this young officer's popularity in France, that the Government shrank from accepting his resignation, and the great career was not checked. In spite of infinite difficulties, by unscrupulous assertion, audacity, genius in war, Bonaparte succeeded in humbling the Italian states: Venice, with her unarmed neutrality, was easily mastered; Beaulieu, who commanded the Austrian army now falling fast asunder, was driven back towards Tyrol; Mantua was blockaded; the pope, Pius VI., signed an armistice with the young conqueror; the English were dislodged from Leghorn and Corsica; Genoa gave in; Piedmont was quieted. When Wurmser came down into Italy with 40,000 Austrians from the armies of the Rhine, these unwilling friends of France at once turned against her; it might have well appalled a man of slighter nerve. But Bonaparte at once made head against his new foes. He was a man who never failed to see the critical point in a campaign or in a battle; and at Lonato, Castiglione, Bassano, and Saint George he drove the old marshal, with his ancient ways of warfare, completely out of Italy with vast loss. The whole series of operations had taken but a week (July 30 to August 5). He hoped next to penetrate, according to

Foreign wars.

Bonaparte in command in Italy.

1796-1797. Carnot's plan, through Tyrol into Bavaria, and there to unite with Moreau. He had, however, underrated the Austrian obstinacy; for Wurmser, gathering fresh forces, resumed the offensive, hoping to free Mantua, and to repulse the small French army. Bonaparte, who had won the battles of Roveredo and Calliano, and had reached Trent on his way for Innsbrück, at once hastened back, defeated Wurmser at Bassano and drove him towards Mantua, in which place he shut him up by the middle of September. In vain did whole German armies, released from the campaigns elsewhere, pour from the mountains down into Italy; the incredible swiftness, clearness of insight, vivacity of genius, ascendency over the soldierly mind, which mark the great commander, saved Bonaparte from being crushed. Seconded by his admirable captains, he won the fields of Arcola and Rivoli, of La Favorita and Corona, in which he utterly paralyzed the Austrians, secured the fall of Mantua, the prize for which the antagonists were striving, and led to the capitulation of Marshal Wurmser himself. Bonaparte instantly set out to reduce the feeble pope, who, scared by his approach, signed (19th February, 1797) the treaty of Tolentino, under which he paid a heavy subsidy, and ceded Avignon and the Venaissin to France, and the Romagna, with Bologna and Ferrara, to the friends of France in the Milanese; Bonaparte also extorted from him a hundred of the chief works of art at Rome, which were sent as spoils of war to Paris. It was believed in France that the last hour of the papacy had struck. The young conqueror, in the midst of his most active movements, had found time to sketch out a future for Italy, and to frame his Cispadane and Lombard republics; he also signed a treaty of peace with Spain. In all things he acted promptly and resolutely, awaiting no man's orders, with perfect confidence in himself and his army The Directory at Paris could but look on in amazement, and, by seeming to advise and approve, endeavored to associate itself with his dreaded triumphs.

Bonaparte subdues the papacy.

The campaign in Germany.

The campaign of 1796 in another way was favored by fortune, so far as Bonaparte's interests were concerned; for the Rhine armies, ill-supplied, and under two commands, were opposed by the archduke Charles, and were not strong enough to carry out the great and dangerous plans of Carnot. Jourdan was repelled, and Moreau, who had penetrated into Bavaria, seeing himself almost cut off and isolated, with Jourdan on the Rhine, and the Tyrolese Alps between him and Bonaparte, was forced to retreat, and late in October was back again in Alsace. A great expedition to Ireland under Hoche also failed completely; and by the beginning of 1797 Bonaparte seemed to the eyes of all Frenchmen their only great and successful captain.

Bonaparte's plans for 1797.

Now he startled all Europe by his audacious plan for the campaign of 1797. He saw his way to achieve that which Louis XIV. had attempted in vain, the overthrow of Austria by a march on Vienna. His army was strengthened, and those on the Rhine ordered to begin active operations, in order to occupy their opponents; quite early in the spring Bonaparte began his great campaign by driving the archduke Charles away from his defences. In spite of the vehement resistance of the Tyrolese and the threatening attitude of Venice in their rear, the French advanced always, and Bonaparte, crossing the Noric Alps, penetrated in April as far as Leoben in Styria; his outposts were pushed to within easy reach of Vienna. Then the Austrian court fell into panic; the Austrian armies were either beaten and scattered or were far off; there was no resisting this terrible and swift advance. The emperor gladly signed with Bonaparte (who had no authority to do it, only the power), "the Preliminaries of Leoben" (18th April) ceding to France Belgium and the left bank of the Rhine from Basel to Andernach, as well as Lombardy, which was to be an independent state. The successful outset of the Rhine campaign, in which Hoche and Moreau had already thrust the Austrians back into the Black Forest, was early arrested by the tidings of Leoben. In Italy fortune again favored Bonaparte. A Venetian insurrection gave him the opportunity of finally overthrowing the ancient republic of Saint Mark. The Venetian citizens were in the main favorable to France, while the oligarchical senate and the peasantry detested the "deliverers." A democratic government, centred in the people of Venice, replaced the rule of the senate. Genoa, under the 1797. grand title of the Ligurian Republic, became the submissive ally of France. The amazement of all Europe, the sympathy of the peoples everywhere, the embarrassments of the Governments, forced even Pitt to make serious proposals for peace.

The Preliminaries of Leoben.

Fall of Venice.

Yet at home affairs looked ill. In spite of the glorious success of the armies abroad, paper money,—which, as La Vallée says, "had done its work, had conquered Europe, had in five years subdivided property far beyond all that had been done in that direction by centuries of feudalism," because it was with paper that the thriftier peasants had been able to purchase the lands of the crown, the church, and the nobles,—these assignats had become almost worthless, and a field for gamblers, who scandalized even Paris with their sham wealth and real dissipation. Republican manners and institutions were alike corrupted and tottering to their fall. It was thought that the elections of the year V., which renewed one-third of the two councils (May, 1797), would reverse the political position, for they showed clearly that the country was returning to royalist opinions. In some departments a "White Terror," the usual accompaniment of the rising spirits of royalists, broke out. A reaction at one began in the Directory, of which three members were still firmly republican, while two, Carnot and Barthélemy, were with the new majority, the "Clichy" party. The Directory was censured for the war against Venice, and the new alliances in Italy; the exiled and depressed party were favored; it was openly said that the councils would reorganize the national guard, overthrow the Directory, and proclaim Louis XVIII. "While Europe was learning to speak with terror-born respect of the name of Republican," says Thibaudeau, "it had become at home a term of contempt, a title to proscription." Napoleon Bonaparte, with his devoted and Jacobin army, had won that respect for France abroad; how would he presently face the difficulties at home? The Directory, finding itself menaced, and its very existence at stake, recalled Hoche, the most single-minded of republicans, with his army from the Rhine, and asked Bonaparte for one of his generals. He sent them Augereau, whom he could trust both to do the work well, and not to stand afterwards in the way of his own ambition. With these the Directory carried out the "Coup d'État" of the 18th Fructidor (4th September, 1797); with cries of "Long live the Republic" the soldiers occupied Paris; the three directors, who had the stroke in hand, Barras, Rewbel, and Laréveilliere, arrested their fourth colleague Barthélemy, while Carnot, the fifth, escaped. The majority in the Councils was overthrown, fifty-three of them condemned to exile, and a kind of Reign of Terror ensued, without much bloodshed. The liberty of the press was suspended, the laws favorable to the royalists repealed, the party of the old régime crushed. Hoche, who had received the command of both the Rhine armies on the suspension of Moreau, suddenly died (it was said of poison), at the age of twenty-nine; he left behind him an untarnished name—that of a peasant-hero of purest and noblest character.

Royalist reaction in France.

The Coup d'État of the 18th Fructidor.

Treaty of Campo Formio.

The Directory, though it breathed again, felt that it lived only by the grace of the army; and so, while it signed the treaty of Campo Formio (Oct. 18, 1797), which embodied the Preliminaries of Leoben, it broke off negotiations with England. Bonaparte's work in Italy done, he was named general of the "army of England," and at the end of 1797 returned in triumph to Paris. In him men saw a new development of Revolution principles, a man of genius under whom those principles were to bring happiness and glory to France, while he taught them by force to the unwilling nations of Europe. He too saw before him an open field for his ambition; he would destroy the kings of the earth by the agency of his Jacobin army; and then, "head of the army," he would become master of France. His Italian blood and tastes taught him how the Roman republic had passed into empire; he would tread the same path, and reach the same splendid goal. The *coup d'état* of the 18th Fructidor had destroyed the authority of the elective body over the Government; when the departments had sent up royalists, the Directory put them down; and, by a natural consequence, the press was at once coerced, lest public opinion, never strong in French history, should gain too much power. The result of all was the weakening of the

1798.

Directory, and the gradual preparation of France for the coming of a real master.

The Directory becomes unpopular.

For the republican party was by no means content with the five Directors,—the "five tyrants of the Luxembourg;" it was a Government without splendor, or principles, or virtue. Consequently, the elections of the year VI. showed a decided majority in favor of republican principles. The Directory did not hesitate to make a second *coup d'état,* this time against the republicans. They also put a lawyer instead of a general into the vacant place in the Directory itself, as if to show that they could do without the army now. Yet, at the same time, they had refused the advantageous terms offered them by Pitt at Lille, and were eager for war; they proposed to remodel all Europe on democratic lines, and rejoiced to have a hand in the overthrow of the papal government, which was replaced by a Roman republic (February, 1798), and in April of a Helvetic republic which replaced the old aristocratic government of Bern. By the former France defied the oldest institution in the world; by the latter she destroyed the ancient neutrality of Switzerland, a step which afterwards turned to her own loss.

Threat of war with England.

War with England was now the chief affair for France; she made preparations on the western coasts, and set a considerable fleet afloat. The state of Ireland, which was thoroughly hostile to England, invited the Directory in one direction; the appeal of Tippoo Sahib in Mysore was heard at the same moment. Should they listen to either? Should they not rather strike at the heart of the enemy by an invasion of England? Bonaparte, who was now at Paris, standing aloof from parties, advising the Directory, living tranquilly with his wife Josephine, interested in his new membership of the Institute, was destined to answer this question for them. Afraid of dropping out of sight, anxious to strike the imagination of France by some singular and distant success, attracted by that love of wide combinations which characterized him, Bonaparte now proposed to the Directory to conquer Egypt. The conquest itself would be easy, for the Ottoman power was all but gone. Egypt would be a splendid colony for France, assuring her on the one hand of the Mediterranean, and on the other hand rendering the trade and mastery of England precarious, if it did not at once prove fatal to it. The thought had been presented to Louis XIV. by Descartes, and approved by Colbert. Choiseul had not rejected it in his day. "We can destroy England in Egypt," was Bonaparte's belief. On the other hand the Directory, after much doubt, adopted the project, partly because of its dimensions and startling boldness, partly because the Five could thereby, for a time certainly, probably for ever, be delivered from the terrible young general whose ambition was clear to them, and whom they feared. And so, in spite of all whisperings of prudence, and in spite of the threatening state of Europe, and the precarious condition of their power at home, the Directory sanctioned Bonaparte's plan, and furnished him with a fine fleet and army for the purpose. That able negotiator Talleyrand set out for Constantinople charged to endeavor to satisfy the Ottoman Porte as to the objects of the expedition.

Bonaparte's position.

The reasons for the Egyptian expedition.

The Egyptian expedition.

Bonaparte sailed from Toulon (19th May, 1798) for Malta, which, by good will of some of the knights, and the idleness and decadence of the Order of St. John, he took at once; thence to Alexandria, having escaped the English fleet under Nelson. He landed, and sent Kléber forward to capture Alexandria; then leaving him to garrison that city, he marched on Cairo, threw off the gallant attacks of the Mamelukes on the way, showed to his soldiers the "forty centuries looking down on them from the Pyramids," defeated Mourad Bey, who endeavored to defend Cairo, and entered that city in triumph. The whole of Egypt was thus subdued with one blow; and Bonaparte was already, with his wonted energy, making plans for the permanent occupation and government of the country, was setting out with his savants to explore the wealth and wonders of the land, was writing home bulletins of glory, when there spread through the camp the news of the battle of the Nile, and one great disaster ruined all. Brueys, after receiving orders either to enter the port of Alexandria or to withdraw to Corfu, had lingered near Aboukir, and was there caught by Nelson. The battle had lasted all the night of August 1; by the morning the English fleet was much shattered, but it had destroyed its enemy, with the exception of four ships which escaped to Malta. It was the ruin of the French navy; and how should the victorious army at Cairo ever get reinforcements or escape from Egypt? Was the fate of St. Louis in store for these new crusaders, who, unlike him, affected Mahometan ways and customs, and issued proclamations which the pious Mussulman might have thought written by a true believer?

1798.

Second coalition against France.

The Ottoman Porte, far from being appeased by French explanations (indeed Talleyrand, shrewd man, saw that it was hopeless, and never went to Constantinople), declared war on France, and allied itself with England and Russia,—it was the beginning of the new politics of the Mahometans in Europe, the beginning of the end for them. A second coalition was at once organized against France. Russia, under Paul I., entered warmly into it, and constituted herself the special patron and protector of the emigrant royalists; the court of Vienna made its preparations to shake off the yoke of Campo Formio; the five republics round about had learnt already that republicanism under French patronage was very like servitude,—the French having an unhappy knack of always alienating those they patronize as liberators,—and seemed weary of seeing their finest works of art sent to Paris, as if to the world's centre. They were already listening to the court of Naples which hotly urged on war. France, on the other hand, was very unfit to fight. She had lost all control of the Mediterranean; the army was weaker in itself, and much weaker by the absence of Bonaparte in Egypt; finance was still amiss, with a terrible deficit; the Directory inspired little confidence. The only ally of France was Spain, and her navy had been destroyed the year before off Cape St. Vincent by Admiral Jervis.

The conscription.

The Directory raised money as it could, and passed the great law of the "conscription," by which every Frenchman was compelled to be a soldier from the age of twenty to twenty-five, and ordered an immediate levy of 200,000 men. War began at once in Italy; before the end of the year the whole peninsula from Piedmont to Sicily was at the feet of France.

Operations in war.

The Directory, having destroyed the neutrality of Switzerland, thought it now necessary to occupy that country, in order to protect the frontiers of France on that side; they also spread their forces along their whole line, from Brune who commanded in Holland, to Macdonald who was at Naples. The army of Masséna formed the centre of the whole; he was instructed to enter Switzerland, seize the central Alps and the Vorarlberg and Tyrol, and thence to threaten Venice. It was an entirely new combination in European warfare, thanks to the new Helvetic Republic. Masséna pushed forward into Tyrol, but was arrested there by the ill-success of his colleagues in Bavaria, and in Italy on the Po. Jourdan had been twice defeated by the archduke Charles on the Danube, while Scherer, in Italy, after some successes, had been obliged to fall back after a disastrous campaign. The Helvetic strategy had proved a failure, and Masséna had to abandon his enterprise. The news of French reverses reaching Rastadt, where France was still trying to intimidate the feeble princes of the empire, the French envoys were told to leave the town, and were murdered on the road by Austrian hussars. The news of this barbarous insult to the sacrosanct persons of a nation's envoys roused immense excitement in France, and entirely did away the depression which had crept over the country. The ranks of the army filled with amazing speed. The Helvetic plan of advance was abandoned; Masséna had command of his old army and that of the Rhine, with his centre from the Lake of Constance to Basel; Macdonald was withdrawn from Naples; the army of Italy was commanded by Moreau, whom the Directory had restored to favor after eighteen months of inaction, consequent on his ambiguous dealings with Pichegru.

The campaign on the upper Rhine showed that the French were not strong enough to defend so long a line; they were pushed back as far as to Zurich, where Masséna defended himself for two days against the archduke Charles, and though in the end successful, he still found it better to fall back again. The Austrians occupied the chief part of Switzerland, and waited for the Russians to come up. In

Campaign in Italy.

Italy Moreau was also overpowered; his great ability as a captain alone saved his army from terrible disasters after the defeat of Cassano, in which Suwarrof treated him very roughly, driving him back and entering Milan. He took up a good position near Alessandria, and waited for Macdonald, who was coming up from Naples. After a very difficult campaign, in which Moreau showed great vigor and devotion, and Macdonald had done his best, and the French soldiers had displayed all their old bravery, the two armies, after terrible losses, united at Genoa. The Directory dismissed Macdonald, gave Moreau the command of a new force on the Rhine, and sent Joubert to command the army of Italy. In attempting to save Alessandria, he was met by Suwarrof, who defeated him completely (15th August, 1799), at Novi, after a very hard-fought battle. This defeat ended the French resistance in Italy; Naples, Rome, the valley of the Po, were all in the hands of the allies. From all sides news of disaster reached Paris; the Dutch fleet passed over to the English; an expeditionary force reached Ireland, only in time to be taken prisoners; the English took Minorca and blockaded Malta; the Russians became masters of the Ionian Islands; Bonaparte even, with the army of Egypt, had suffered defeat from Sir Sidney Smith at St. Jean d'Acre on the Syrian shore, in May, after having taken Gaza and Jaffa. In India the friend of France, Tippoo Sahib, lay dead in the breach of Seringapatam (4th May, 1799). No wonder if after this the position of the Directory became very critical. It was loudly declared, in spite of facts, that the Five had intentionally sacrificed Bonaparte; the public feeling in his favor grew with men's sympathy and indignation. The Government was, with exception of Barras, one of honest mediocrity, a dangerous type in France; Sieyès, who entered the Directory in the year VII. (1799), was regarded as its enemy, and men rallied round him; Lucien Bonaparte, who was one of the Five Hundred, led the opposition, which declared the councils to be in permanent session; and thus the legislative power once more asserted its authority over the executive (18th June, 1799). It was a republican revival; the constitution of the year III. seemed to be set aside; the character of the Directory was changed by new appointments; things fell into confusion. It was clear that a head was wanted.

Bonaparte's return.

Tidings of this state of things at last reached Bonaparte, who had been completely cut off from France by the disaster of the fleet. It is said that he learnt it from a packet of gazettes forwarded to him by Sir Sidney Smith. Turkish armies had been gathering force against him, and baffled in Syria, he had now to fight for existence in Egypt. The battle of Aboukir (24th July, 1799), which destroyed one of their armies, set him free. Not without lies and deceptions he stole away, leaving his army under command of Kléber, whose independent temper troubled him; for as he had failed to conquer Syria, and to win an Oriental empire, he must now hasten home to push his fortunes in France. About the time that he reached Paris (October, 1799) in a kind of triumph, as the hero of the brilliant success of Aboukir, the anxious country also received tidings of the splendid campaign of Masséna in Switzerland, the victory of Zurich (24th September, 1799), the quarrels of Russia and Austria, the retreat of Suwarrof into Bavaria, and of the lesser successes with which Brune defeated the duke of York in Holland, and forced him to sign the capitulation of Alkmaar (18th October, 1799). France, relieved rather than triumphant, welcomed Bonaparte with enthusiastic transports. No one cared to inquire what he had done with his army; he was there, and that sufficed; he was there, and the reign of order was about to begin. To this, then, had the reign of Reason, the rights of men, the republican propaganda, fallen; men yearned only for a strong man, a stable government under which they might have equal peace. And Bonaparte was willing enough to accept the part thus pressed on him; he called to himself the moderate party, by far the largest in France, and prepared to seize on a dictatorship. On the 18th and 19th of Brumaire (9th and 10th November, 1799), Bonaparte, who had allied himself with Sieyès, and had round him a powerful group of friends and generals, carried out his plans in spite of the resistance of the patriots, the hostility of the Five Hundred, the uncertain temper of the troops. It was a moment of immense peril for Bonaparte and his brother Lucien, until, in reply to an appeal to the soldiers, in which nothing was spared that could rouse them, the grenadiers rallied to their hero, and ejected the council then sitting at St. Cloud. The Directory was suppressed, and in their place were three consuls, appointed provisionally. These were Napoleon Bonaparte, Sieyès, and Roger-Ducos. Two commissions were named to revise the constitution. The three consuls took oath to the Republic.

The Coup d'État of 18th and 19th Brumaire.

The last stage of the Revolution.

Thus the Revolution passed into its last stage. It had tried to live with a king, had tried to govern by democratic severities, had also been moderate; it now became military. The despot, who, according to Aristotle, haunts like a dark spectre the steps of democracy, had now, at ten years' end, overtaken and destroyed its forerunner. "Eadem magistratuum nomina," no doubt; also, as in the case of imperial Rome, a new dynasty founded on the sword.

Bonaparte's position.

Bonaparte had no sooner secured his revolution than he set himself with his wonted vigor and sagacity to consolidate it. He saw that France was weary at heart of the struggles and changes of parties; he wished to sweep away all remembrance that he too had been, in profession at least, an ardent partisan; he felt that he, supported by his bayonets, was strong enough to treat faction with contempt. Therefore he said, "Let there be no more Jacobins, nor moderates, nor royalists; let all be Frenchmen;" and as he said it, all France recognized that this was the equality they sought, and hailed him as their master. When the consuls sentenced fifty-nine democrats to exile, the popular feeling showed itself so completely in favor of an amnesty for all that they were compelled to recall the order. Parties were now insignificant, because Bonaparte was great.

Constitution of the year VIII.

On the 13th of December, 1799, the "Constitution of the year VIII.," chiefly the work of Sieyès, was put forth. There were to be three consuls, first, second, and third, not equal as at Rome, named for ten years, and re-eligible. Of these the first consul had in fact all the power; he alone could promulgate laws, name ministers, ambassadors, and officers generally, while the second and third had only a consultative voice, which could not be of great avail; their two voices could not out-vote that of their so-called colleague. A council of state was to be charged with the drawing of all laws, its members to be named by the first consul; laws thus framed should be presented to a tribunate of a hundred members; this body, after discussion of the project, was to pass it on, in the hands of three orators, who should discuss it against three counsellors of state nominated by the Government, in the presence of the legislative body, which finally adopted or rejected the law by a secret ballot without debate. This legislative body was composed of three hundred members. Lastly, there was to be a senate of eighty life-members, who should confirm or annul all acts which might be referred to it, on grounds of their constitutional character. They also were to name the consuls, tribunes, and the legislative body, choosing them from a list of 5000 names, which were to be chosen by 50,000 persons, who themselves should be elected by 500,000 electors, who in their turn were to be named by universal suffrage. Senators were to be elected to vacancies by co-optation, from a list of three candidates presented by the legislative body, the tribunate, and the first council. Bonaparte had modified this elaborate structure before it saw the light, by significantly cutting out all the poor guarantees for liberty it contained. As it stood, it was merely the decent robe which shrouded the naked dictatorship of the first consul. The people, by an enthusiastic plébiscite, adopted it almost unanimously. Bonaparte having accepted the post he had arranged for himself, two new men were associated with him; Cambacères, a distinguished lawyer, and not a politician, as second consul; and Lebrun, an elderly man, good at the bureau, the type and representative of French officiality, as third consul. The senate was filled with the most distinguished names in France—men great in science and arts, as well as in arms or politics; the legislative body whom they selected, after the decimal system explained above had reduced the candidates to 5000, were certain to be quiet obsequious people. Finally, lest public opinion should be disturbed in its happy unanimity, the freedom of the press came suddenly to an end; for the First Consul thought that thirteen journals were enough for France,

The three consuls.

The First Consul and his ministers.

The new despotism.

and these were all duly submissive to the Government. Thus did dictatorial power usurp the place of liberty, and a system began, based on falsehood and illegal force, yet so splendid and so well-suited to the needs of fainting France that she has only in our day at last escaped from the glamour of it, and from the worship of the Napoleonic idea. The First Consul took up his abode, early in 1800, at the Tuileries, and at once formed a ministry:—his brother Lucien for the home office; Gaudin for finance; Berthier for the army; Talleyrand, ex-bishop, for foreign affairs; and Fouché, lord of spies, for police,—the last two the only politicians in the company; they both had abandoned holy orders. Without a portfolio, in close relation with Bonaparte, was Maret, better known by his later title of duke of Bassano, the first founder of the *Moniteur Universel*, a man of upright character and unwearied industry. The spirit of system, visible in the constitution, and in the tastes and character of Bonaparte, was at once indelibly impressed on the administration of the country. All sprang from one centre, the First Consul; a prefect was set over each department, with sub-prefects under him; it was a more perfect development of the intendant's office under the old régime; the prefects named the local mayors, and thus the whole machine received all its impulses from headquarters, and formed a perfectly compact and easy-going government. Local law and local finance were also organized in a similar way; and by a simple edict as to the method of tax-gathering, joined to the new confidence all France felt in her ruler, the crushing difficulty of the deficit was at once got rid of. Peculation became impossible; taxpayers were equally and fairly charged; none were allowed to fall into arrears; and the country, being really rich, speedily rose into prosperity. Salaried officials covered the whole land with a network, each for his daily bread interested in the stability of government. The principle of the new government, in general administration, in finance, in the church, in the law, was that of absolute subservience of all officials to the head; and the love of France for bureaucracy, which has made her the chosen land of an official hierarchy, made this organization the most complete and successful that the world had hitherto ever seen. The disturbances in the west, caused by the monarchists, were put down without difficulty.

Proposals to George III.

Bonaparte had promised peace to France; and he at once wrote a letter to George III., with characteristic indifference to the English constitution, offering to make peace directly with him. Pitt, as minister, replied by refusing to negotiate till France should replace on the throne her ancient dynasty. The terms of the refusal offended the French people, and strengthened Bonaparte's position. Russia made peace; Prussia stood neutral. Austria and England, with Bavaria, Würtemberg, and Mainz, determined to continue the contest.

Campaigns of 1800.

The battle of Marengo.

Peace of Lunéville.

The campaigns of 1800 were thus planned by Bonaparte. Masséna with a weak army was left to defend the Riviera from Nice to Genoa, and there to employ as much as possible the Austrians in Italy. The Rhine army, led by Moreau, should threaten Bavaria, after finally grasping the all-important strategic position of the corner of the Black Forest, between Rhine and Danube; meanwhile Bonaparte himself, quietly and with scrupulous secrecy, collected a third great army for himself, destined for the Po. Masséna's army was driven back and suffered considerable reverses; the Austrians under Melas penetrated across the frontier; Bonaparte, however, knew that Provence was not the heart of France, and that with Masséna holding out at Genoa, no very serious attack could be made in the south. Moreau's army of the Rhine penetrated into Bavaria, drove the Austrians back to Ulm, and prepared to send a part of its right flank across the Alps to join the main central movement of Bonaparte. His army of the centre, collected rapidly at Geneva, made its famous passage of the St. Bernard, while his right went over the Mont Cenis, and the right flank of Moreau's army, now his left, crossed the St. Gotthard. To the amazement of all, the Austrians saw Bonaparte returning to the scene of his old triumphs, and entering Milan in triumph. They hastily drew themselves together; the fall of Genoa, after a splendid defence by Masséna, freed a large force. The astounding battle of Marengo (14th June, 1800) decided the campaign; "in it the Austrians lost all they had gained in eighteen months and by twenty victories." The armistice of Alexandria followed at once; for Marengo had given Bonaparte the command of all the upper valley of the Po, and the Austrians withdrew behind the Mincio. Meanwhile Moreau, with the army of the Rhine, was doing excellent work in Bavaria, and had taken the ascendant all along his line, when tidings of the convention of Alexandria brought his campaign to an end. Peace, however, did not follow; the English Government eagerly urged the Austrians to hold on, and hostilities began again, late in the year, in the valley of the upper Danube, where Moreau, supported by Ney, won the splendid victory of Hohenlinden not far from Munich (2d December, 1800), and after a series of brilliant combats drove the Austrians back, till Vienna was in terror. Then an armistice was signed at Steyer, by which Austria ceded her strong places in Tyrol and those of Bavaria to the French army. The army of Italy also won great advantages, and compelled Austria to sign an armistice, by which France occupied a number of important points in north Italy. In concert with Pius VII., lately elected pope, Murat menaced the kingdom of Naples, and a third armistice, which closed the Neapolitan harbors to England, ended the war. The peace of Lunéville was concluded on February 9, 1801, between France and Austria. It was drawn on the basis of the treaty of Campo Formio; France secured the left bank of the Rhine and the Belgian provinces; the independence of the four republics was recognized; the pope was replaced in his states; Tuscany was ceded to France, and became the heart of a new kingdom of Etruria. The king of Naples also made his peace with France, on the terms of his armistice.

The opposition of England.

England alone stood out against the First Consul, who seemed able to impose his will on Europe. It is impossible, at this distance of time, to realize completely the combination of causes which led to the determined resistance of England; the most prominent and least defensible cause was the "dominium maris," asserted in opposition to the principles of the armed neutrality of 1780. At the end of the 18th century the English navy had risen to very great proportions, and the interests of the country, as was then thought, were hostile to the claims of neutral commerce. Consequently, the northern powers, irritated and insulted by English claims carried out with the strong hand, formed a great coalition at the end of 1800, in which Denmark and Sweden, Russia and Prussia, set themselves to secure the liberty of the seas. They invited the First Consul to join them, and he desired nothing better; it seemed as if the national hatred of France against Pitt and England would now find vent, and would overthrow that persistent enemy. It seemed, too, as if Bonaparte, as he consolidated his power at home, would be able to assert himself also as the protector of the liberties of Europe abroad. On the other side, the English Government did not waste time. Parker and Nelson were sent into the Baltic, to break up the coalition, if possible. As Denmark had the most ready fleet, and was in fact the most active member of the coalition, Nelson determined to strike hard at Copenhagen. The hard-fought battle of Copenhagen, in which the Danes made heroic resistance to the English forces, led to an armistice; and the assassination of the emperor Paul I., which reversed the policy of Russia, brought the great coalition to an end. By the summer of 1801 the northern powers were all again the friends and allies of England. It was in vain that Bonaparte threatened the English shores with invasion; he felt that his great plan had broken down, and wanted a little breathing time. He made peace with Portugal, occupying with French troops two of its provinces. On the other hand, the army Bonaparte had left in Egypt, after the refusal of England to allow it to return to Europe, had lost its general Kléber, who had been assassinated by a Turk; all the efforts made to reinforce the army from France failed; an English force from Minorca, and 7000 Sepoys from India, as well as a Turkish army, now converged on Egypt. Abercromby, at Aboukir, repulsed the attack of the French under Menou; the French army after a short time had to capitulate (27th June, 1801), and was carried over to France in English ships.

At the same time war between France and England was drawing to an end; the negotiations were concluded in March, 1802, by the peace of Amiens. The principles of the armed neutrality had failed to establish themselves, and Eng-

1801-1804.

The peace of Amiens.

Bonaparte's organizing power.

The Code Napoléon.

land secured not only her command of the sea, but her lordship over India. She had also freed Portugal, the kingdom of Naples, the States of the Church, from French control; Egypt was restored to the Sublime Porte. On the other hand, the authority of France in central Europe remained unbroken; the great campaigns on the Po and the Danube had secured this result. The brilliant successes of the French arms, and the treaties of Lunéville and Amiens, prepared the way for the next forward movement of the First Consul. Meanwhile France at home was prosperous and productive; Bonaparte's splendid gifts of organization continued to work wonders; he made the income of the country meet all the outgoings, and created a real surplus, a thing unknown throughout the previous century. On every side fresh energy was evoked, new enterprise stimulated; all things were felt to proceed from one centre,—a centre not, as in the old monarchy, of selfishness and waste, but of active and beneficent influence. Too little was left for private and spontaneous effort, that being the weak side of the development of France; yet considering the state of the country, the rule of a beneficent despot was welcome and most successful. The greatest work of this period was the construction of the civil code, on which Bonaparte himself worked with amazing zeal, clearness, and ability. It was issued in January, 1804. In other domestic matters his ascendency displayed itself more and more; the attempts made against his life enabled him to crush and terrorize the extremer republicans. The system of *senatus-consultes*, by which he veiled his arbitrary edicts under the authority of an obsequious senate, enabled him by degrees to crush the remnant of free discussion still possessed by France in the tribunate of the constitution. He got rid of constitutional opposition as readily as he had freed himself from the attempts of conspiracy, and reduced the legislative assembly to a nullity. The age of the Revolution seemed to be past; the grand organizing faculty of the First Consul was doing what the destructive forces of the republic could not do,—was reconstructing society on a basis partly new and partly old, was centralizing authority, was creating a despotism adapted to the phraseology of a "Republic one and indivisible," and giving to France a new position among the nations. For the autocracy of Napoleon was the direct outcome of republicanism, as it allied itself with military organization, and slowly attracted to itself many of the relics of the old order of things. Though essentially hostile to real liberty, the coming empire sprang out of a great and generous effort made by France in that direction; it was not till our own days that she succeeded, if even now she has succeeded, in shaking off the iron trammels of imperialism, and ruling herself with constitutional freedom and calmness under the republic of her choice.

The reconstruction of society.

The Concordat.

1804.

Return of the émigrés.

In these years (1800–1804) the First Consul not only crushed the spirit of the two chambers and the tribunate, but also passed on boldly to reconstruct French society, a much harder task. Directly after the peace of Amiens, when France was in the first flush of an unwonted tranquillity, Bonaparte made terms with the papacy, and by the Concordat reconstructed the Church of France. All the old divisions were swept away; ten archbishoprics and fifty bishoprics were newly mapped out by First Consul and Pope; and in 1802 the will of Bonaparte and Pius VII. peremptorily put an end to the schism between refractory and constitutional clergy, and so cut away from the ancient monarchy its chief support. The traditional life of the church was rudely cut off; the authority of the state was displayed in full; the constitutional priests were sacrificed to the political needs of the First Consul, who saw that, if he would have firm hold of power, he must first win over the royalist clergy. The chief opponents of the Revolution got the chief rewards; the constitutionalists were mortified. From this moment dates the friendship between the Napoleonic dynasty and the Church of Rome; from this dates also that secret hostility between the clergy and the army, which has often since that period produced results none the less striking because their origin was concealed. For the time, however, the paramount authority of Bonaparte over the army made resistance impossible. The weak point in the arrangement was the certainty that in their hearts the courtier-like clergy would always prefer a Bourbon to a Napoleon; and of this, too, history has provided more than one proof. Still, for the time, in church as in army, the step was successful, and gave strength to Bonaparte's position. The emigrants also returned, thanks to an armistice, and in large numbers took oath to respect the new government. It was a bold and hazardous step, which the First Consul afterwards saw good reason to regret. An exiled adherent of a lost cause never changes, never learns prudence, never is satisfied with the *de facto* ruler of his people; his mind is warped, his moral sense, in matters political, vitiated; the existing government has in him a secret enemy, a plotter and intriguer, a fierce fanatic, outwardly subdued, inwardly smouldering, and ready to burst forth in flame whenever the breath of a royal whisper fans the embers.

The university of France.

The Legion of Honor.

The constitution of the year X.

In restoring the Catholic clergy and the ancient nobles to France, Bonaparte affirmed a principle hostile to the revolution, necessary for a despotism. He must have classes of society "intermediate," as he said, "between the people and the powers;" "to settle the bases of the Republic, one must throw on the sand some masses of granite," an apt illustration of the way in which this despot of an iron will determined to crush all liberty in France. Unfortunately for him his heavy "masses of granite" after all, while they crushed the people, formed but an insecure foundation for himself. The same motive led him to reorganize education and to establish the university—in his hands a mere creature of power, a machine to turn out public officers, and to centralize and unify all education in France; public schools or *lycées* throughout France were all dependent on this central university. Education, as is always the way under a despot, took a mathematical and scientific bias; moral sciences and history found no place; theology was left for the clergy in their seminaries; the dead languages held a secondary position. To this new organization France owes, in large part, her unpractical ignorance of modern languages, geography, political economy; she has not yet entirely shaken off the load thus imposed on her shoulders. Next, the institution of the Legion of Honor was the beginning of a new aristocracy, and was meant to supply another blank in the new hierarchy of this growing military despotism. Finally, the First Consul constructed a new constitution, that of the year X., which strengthened his own position, and weakened still further all the elements of republican and constitutional opposition. It was adopted with obsequious unanimity (4th August, 1802). During this period the influence of the First Consul was also dominant across a large part of Europe: the four republics rested on him, and were much modified at his demand; the lesser states of Germany allowed him to interfere in their affairs; he was able to overcome, at least for a while, the suspicion and ill-will of Russia. On the seas also his activity was felt: he was anxious to restore the colonial power of France, shattered by the war; he interfered in the affairs of Hayti, and hoped also to recover his influence over Egypt and the Mediterranean. England, seeing her special province of the seas thus invaded, and never very well pleased with Bonaparte and the peace of Amiens, declared war against France in the spring of 1803.

Second war with England.

The Empire.

Bonaparte at once occupied on the one hand Hanover, on the other Naples, made friendly overtures to the United States, and threatened the English shores with invasion. Europe was divided into two hostile camps, and a great and stubborn war impended. Russia at once sided with England; the court of Vienna, though unable at once to go to war, warmly sympathized with the opposition to France; Prussia held aloof; England also seconded the underground resistance of the old royalists in France. This was the period of the conspiracy which led to the seizure by Bonaparte of the duke of Enghien, a seizure on the soil of Baden, excusable on no plea of international law or sudden necessity, his military and violent mockery of a trial, and his peremptory execution. Moreau, whom the First Consul was glad to be rid of, for he alone could be a rival in the affections of the army, was exiled to the United States; Pichegru committed suicide in prison; a handful of others were executed; and the First Consul, taking advantage of the excitement and indignation of all France, had himself proclaimed Emperor of the French (18th May, 1804). A new constitution, of imperial texture, was woven for the occasion. Hereditary succession was affirmed; six great dignitaries, with high sounding imperial titles and no power, were established; the military splendors of the marshalate reappeared; the council of state and the senate were charged with all legislative functions; the older bodies, the tribunate and the legislative body, were a mere appendage; and thus began the imperial age.

VI. The Empire.

Imperialism.

Imperialism is an overlordship over nations. It is more than this; it is, strictly speaking, the representation of both the empire of old Rome and the Holy Roman Empire, with all the high claims involved therein. In this sense, imperialism claims temporal lordship over all the earth, and rears its head side by side with the papacy, which asserts a spiritual headship as wide and as complete. The full theory of neither has ever been realized; and as time has gone on, both ideas have grown weaker, and pale images of both have sprung up. As the world has become wider, it has become clear that neither the principle of nationality nor that of independence of thought was compatible with either empire or papacy. And, as time has gone on, the imperial name itself has undergone large modifications. We have seen an empress of India, an emperor of Austria, an emperor of China, an emperor of Mexico,—all names completely wide of the true imperial idea. And the title of "Empereur des Français," which Bonaparte now assumed, with acclamation of France, carried in itself a reversal of old ideas, for it affirmed a personal lordship, based on the sovereignty of the people, as expressed by a plébiscite. Be this as it may be, the power was real, and was wielded with iron will and unscrupulous genius.

The third coalition.

The strength of England on the seas soon compelled Napoleon to make his chief attack on Austria, while England and Russia once more drew together against him. In 1805 his grand army penetrated into the valley of the Danube, took Ulm, and in spite of the king of Prussia's accession to the coalition, pushed on as far as to Vienna. Napoleon occupied all the upper and middle Danube valley, and then marched northwards in pursuit of the emperor Francis of Austria, who had fled into Moravia. On the 2d of December, 1805, he won the great battle of Austerlitz, which for the time reduced the allies to impotence. Peace followed at Presburg (26th December, 1805), between France and Austria, by which that ancient power was parted out among its neighbors.

Peace of Presburg.

Battle of Trafalgar.

Two months before this the decisive battle of Trafalgar had finally disposed of the remaining naval force of France and Spain (21st October, 1805), and, leaving England in complete security, enabled her to continue without fear her task of obstinate resistance, at the very moment when France seemed to have completely triumphed over the united hostility of continental Europe.

Napoleon's Confederacy of the Rhine.

The emperor at once, characteristically guided by his love of grand conceptions and far-reaching combinations, set himself to surround France with a great system of "federative states of the empire," in "three compact nations of Italians, Germans, Spaniards." But if he overrated his own constructive genius, he underrated the obstinacy of his enemies, and soon found himself met by a fourth coalition, against which he proposed to build up the Confederacy of the Rhine, and to restore the dependence of the lesser German princes on France, and so to carry out the ideas of Henry IV., of Richelieu and Mazarin. War, however, broke out in a different quarter. The restoration by France of Hanover to England, a part of the series of negotiations which followed the peace of Presburg and the death of Pitt, roused the utmost anger in Prussia, and led to new combinations, as a consequence of which the king of Prussia, without waiting for help from England or Russia, rushed on war (September, 1806). The battle of Jena (14th October, 1806), and Auerstadt completely overthrew the Prussian power, and the conquest of Prussia was completed before the end of the year, and before the Russians had time to come up to the succor of their allies. A winter campaign followed, in which the sufferings of the troops and the obstinate resistance of the Russians at Pultusk and Eylau (8th February, 1807), arrested the triumphant movement of the emperor for a time. In the summer of 1807, having secured the line of the Vistula, he defeated the Russians at Friedland (14th June), and took Königsberg. The treaty of Tilsit (7th July, 1807) followed; for Russia needed rest, and Napoleon was not sorry to pause. It is the highest point of the emperor's renown. His hand was felt throughout all Europe; it seemed as if England alone was beyond his power.

War with Prussia.

The treaty of Tilsit.

The Spanish War.

The determination of the emperor to rearrange the whole map of Europe, and to assert his power in every quarter, led him to that Spanish war whence sprang the resistance which at last overthrew him. For he decided on subduing the whole Peninsula, including Portugal; the Portuguese court took flight to Brazil on the approach of Junot, and Charles IV. of Spain abdicated when Murat threatened Madrid. Napoleon at once placed Joseph Bonaparte, a very incompetent person, on the Spanish throne; and when the Spaniards showed their irritation with him, he too abdicated, and gave place to Murat, who had married Caroline, sister of the emperor. Then the Spaniards rose in revolt, and that wearing guerilla warfare began which opened the way for the successful arms of England. The capitulation of Baylen ruined for the time the French power in Spain; Dupont and Vedel were compelled to lay down their arms; in Portugal England now began to appear, and on 21st August, 1808, Sir Arthur Wellesley won the battle of Vimiera. When Napoleon found that, as thus in Spain, the peoples rose against him, he ought to have recognized the hollowness of his friendships with the kings. He longed, however, to be one of their comity, as well as to have vassal kings and princes under himself; to this end he had created a new and high-sounding aristocracy around his throne; for this end when Germany, led by Austria, now began again to move against him, Napoleon drew towards Russia, and was completely duped by the emperor Alexander. Having, as he thought, made all safe on that side, he turned his attention to Spain, and, in spite of guerilla warfare, entered Madrid (4th December, 1808). Sir John Moore, who from the west coast had penetrated as far as to Salamanca, was driven back by Soult supported by the emperor, and after the battle of Corunna (14th January, 1809), in which he fought at bay and lost his life, the English had to embark and withdraw. The siege of Saragossa, however, contested with all the tenacity and devotion of the Spanish character, wore out the strength of the French forces, and their tenure of Spain was felt to be most precarious.

Fifth coalition.

Now followed a fifth coalition against Napoleon, whose subjects at home were beginning to show signs of exhaustion. Still, when his army marched into Bavaria it seemed as strong, as enthusiastic, as well commanded as ever. By splendid combinations and a series of victories, Napoleon swept down the Danube valley, and took Vienna. Ere long he was checked by the terrible battle of Gross Aspern or Essling (21st and 22d May, 1809) just below Vienna, in which his victory was purchased at a price he could ill afford. He had to pause, while the Austrian court gathered itself together in Moravia. When he saw this, and felt that all Europe was beginning to move behind him, he too gathered his strength up, and marching against the Austrians defeated them, under the command of the archduke Charles, in the decisive battle of Wagram (5th and 6th July, 1809),—a victory which, while it ruined for the time the military power of Austria, also weakened him to a dangerous point. It was therefore at once followed by the armistice of Znaim, which led in a short time to the hollow peace of Vienna. This agreement broke up the coalition, handed over to Napoleon the Illyrian provinces with a part of Tyrol, and gave him an imperial bride in Maria Louisa, daughter of the Austrian emperor. Napoleon at once returned to Paris, to celebrate his marriage, and to organize afresh his vast empire. Nothing escaped his care; he coerced the press, rearranged finance, which had grown to be a very heavy burden, saw that the church was duly submissive and duly paid, and held the pope in honorable bondage at Savona. In other parts things went not amiss: the foolish Walcheren expedition mouldered away; in Spain Wellington with difficulty held out against Spanish indolence and corruption, and the genius of Marshal Soult. The lines of Torres Vedras (1810–1811), which the English gen-

Battle of Wagram.

Peace of Vienna.

1811–1812.

eral defended against Masséna, form the turning-point of the history of Napoleon's triumphs. His last great victory was Essling; henceforward his successes will bring no lasting good; his failures will draw him toward his fall. The successful winter in the Torres Vedras lines was followed by Wellington's famous campaign of Almeida, Badajoz, and Ciudad Rodrigo (1811–1812), in which the English general separated Soult and Masséna, while he secured for himself a splendid base of operations for the future.

The war with Russia.

Sixth coalition.

But before this, the flattering friendship of Russia had turned to gall. Ever since the end of 1809 Napoleon had seen how hollow all was in the north, and at last, early in 1812, war broke out. Napoleon, misled by brilliant schemes, and ever trustful in his star, determined at once to crush the resistance of Russia; as he had entered Berlin, Madrid, and Vienna, so he would also enter Moscow, and thence at last dictate peace to all the world. He seemed to think he had two things only to do, "conscrire et prescire,"—to summon up and sacrifice the whole youth of France as conscripts, and then to prescribe his own terms to Europe. This terrible blunder cost him his throne. He left his soldiers in Spain to take care of themselves; though he must have seen that they were almost as much in want of help as that army had been which he so selfishly left behind him in Egypt. With this difficulty in his rear, and the vast distances, huge armies, and terrible climate of Russia before him, he set forth in the spring of 1812 on his famous and fatal march to Moscow. He crossed the Niemen and reaching Wilna, the capital of Lithuania, halted there to recruit his troops (June, 1812), which were in unusual disorder. Here he proclaimed his sympathy for Poland, while he tried not to offend the Austrians or to unsettle their share of the dismembered kingdom. Negotiations also went on; the emperor of Russia offered terms, which were refused at once; Bernadotte, now by election prince-royal of Sweden (21st August, 1810), who knew the character of his late master, also had dealings with Napoleon, while at the same time he made alliance with the czar, and began a sixth coalition against France; England joined the new league, and Turkey made peace with Russia. Still Napoleon persevered; he won the hard-fought battle of Smolensk (17th August, 1812), though he did not succeed in cutting off the retreat of the Russians, who burnt everything as they withdrew, leaving a desert for the French. The terrible battle of Borodino, one of the hardest struggles in history, gave Napoleon a victory, though the Russians again withdrew in good order (7th September). They did not attempt to defend Moscow, retiring thence, and leaving the capital as "a snare in which the ruin of the foe was inevitable." And so it proved; the French army entered Moscow in triumph, and Napoleon established himself at the Kremlin (15th September); the next day the whole town burst into flames; after five days nothing was standing save the churches, and perhaps a tenth of the city. It was savage as it was heroic; at any rate, it was completely successful. The emperor Alexander spurned all overtures for peace; his armies grew more threatening; the French communications were clearly unsafe; the winter was not far off; it looked as if Napoleon might even be shut up in Moscow. The great retreat was inevitable. In the middle of October the French army began to pour out of the gates of Moscow, and then began a running battle at every point. The army bled at every pore, and Ney with the utmost heroism protected the rear. At last Napoleon reached Wilna; there the worst of the pursuit seemed to be over, and there were both food and raiment; there he, leaving Murat in command, abandoned the shattered remnants of the grand army, and took flight to France (5th December, 1812). The remainder of the retreat was even more ruinous than what had gone before; it was but a handful out of so great a host that reached the frontiers of France again. Of 450,000 men who set forth, probably not 100,000 returned.

The war in Spain.

In Spain affairs had been almost as bad for France. Early in 1812 Wellington had taken Ciudad Rodrigo and Badajoz, and then advancing into Spain, defeated Marmont and the French at Salamanca (22d July, 1812), and occupied Madrid. In the autumn Soult, by able dispositions and a stronger force, compelled him to retreat again to Ciudad Rodrigo. The campaign had shown the weakness of the French occupation, while it had greatly lessened their resources and the part of the Spanish territory at their disposal.

1813.

War with Prussia.

The battle of Leipsic.

France still worshipped her chief. The new and severe conscription gave him another vast army; and he set forth to punish Prussia, which had declared war against him, in concert with Russia. The Germans always have honored this period of their history as a great resurrection, and as the birthtime of their true national life. The emperor passed through Mainz to Erfurt, and fought his first battle, a severe one, on the plain of Lützen; the defeated Prussians and Russians fell back in good order through Dresden, Napoleon following them hard, defeating them, and driving them out of their intrenched camp at Bautzen (20th and 21st May, 1813), whence they retreated again in perfect order. It was evident that the temper of Germany had entirely changed since Jena. An armistice, which followed, led to much negotiation at Dresden, where Napoleon's headquarters lay. The upshot of it all was that Austria joined Russia and Prussia, and the war went on. The attack of the allies on Dresden, which lasted two days (26th and 27th August), ended in their repulse and defeat; Russian supports came up in October, and it was plain that they were going to cut the French communications, and coop Napoleon up in Dresden for the winter. The king of Bavaria at this moment joined the allies, and made the emperor's position still more precarious. He now withdrew from Dresden, and near Leipsic came into collision with his enemies, who were waiting for him there. On the 16th of October, 1813, began one of the decisive battles in the world's history. Napoleon's forces were far outnumbered by those of the allies; and some of his German troops deserted in the thick of the fight. The battle raged on the 16th and the 18th; on the 19th Napoleon, completely defeated, began to withdraw. At Hanau he overthrew Wrede, and cut a passage for his army; the victorious emperors followed closely on his heels, and barely half his men reached home. The campaign had broken to pieces the dominance of France in Europe; and all the imperial creations, the confederation of the Rhine, the kingdom of Westphalia, the Batavian republic, came to an end. George III. resumed the electorate of Hanover; Austria recovered her lost provinces; in Spain the throne of Joseph Bonaparte fell, for the battle of Vittoria (21st June, 1813) had utterly destroyed the power of the French in the peninsula. Wellington drove them out of Spain, and in spite of the vigor and ability of Soult, the two great frontier fortresses of Pampeluna and St. Sebastian fell. Wellington entered southern France, and in November threatened Bayonne. Napoleon could only complain, with the tone of an irritated master, that he had been defeated by the treason of his servants, that is, of his German subjects.

The invasion of France.

On his return to Paris, the emperor found the tone of feeling very much changed. In the legislative body men ventured to denounce his rule; such outspoken words had not been heard for years. He angrily replied with his "l'état, c'est moi," "to attack me is to attack the nation," and abruptly closed their session. Henceforth he would rule alone, and alone with the ruins of his armies face the terrible invasion that was coming on. The whole conditions of his warfare changed; he must now act on the defensive, and bear to see France trodden under foot, even as France till now had trodden all Europe under her feet. The allies came in almost without resistance in three armies,—the Austrians from Basel advancing to Langres; Blücher with the Prussians crossed the Vosges to Nancy; the army of the north, Russians and Prussians, came down to Namur, and thence to Laon. In all there were full 200,000 of them, a force quite double that at the emperor's disposal. They all sat on the inner slopes of the mountains which form the northern, north-eastern, and eastern defences of France, awaiting the moment to advance. Napoleon had the one great advantage of the inner line. But after fighting the severe battle of Arcis-sur-Aube, he tried to paralyze the allies by striking at their communications, and so lost his one advantage; for they, instead of hesitating, marched boldly on for Paris, defeated Mortier and Marmont in the very suburbs, and forced the proud capital to surrender before Napoleon could come up to its defence. The allied emperors were received with cries of "Long live the king," "Long live the emperor Alexander." A provisional gov-

1814-1815. ernment of senators decreed the downfall of Napoleon; the other constituted bodies followed; the imperial government was swept away as in an instant. The emperor, amazed at this sudden impulse of the country, abdicated (6th April, 1814) on behalf of his son, and finally (11th April) he abdicated completely, offering himself, as he said, a "personal sacrifice" to France. His titles, honors, an ample income, and the island of Elba in full sovereignty, were left to him.

Louis XVIII.

The restoration of the Bourbons followed at once. Louis XVIII. appeared in Paris, the protégé of foreign bayonets, and not ashamed to own that he owed his return to English help. Peace followed at once; France shrank back to her old dimensions, as she had been in 1792, with some slight modifications. Louis XVIII. lastly promulgated a new charter, granting some constitutional rights to his subjects. The document was dated as of the 19th year of his reign, as though Napoleon and the Revolution had never been. The peerage was restored, its numbers now unlimited except by the king's will, who alone could appoint peers; a chamber of deputies, elected by a limited suffrage, had really but little power, as the king reserved to himself the initiative of all laws; the Roman Catholic religion was declared the faith of the state, and full toleration granted to all dissidents. This was the constitutionalism of the reaction. It showed how far France had travelled from the days of the old régime. There was no question of ancient privileges or of feudal usages; the very name of States-General had disappeared. No reaction, however severe, ever brings things back to the point from which they had drifted; France could never again be what she had been under Louis XIV.

The return of Napoleon.

A congress at once assembled at Vienna, under Metternich's presidency, with a view to a peaceful resettlement of Europe. It was, however, suddenly turned to warlike thoughts by the startling news that Napoleon, leaving Elba, had landed near Cannes (1st March, 1815). He appealed to citizens and soldiers alike; he appealed to the people; he spoke only of peace and liberty, and a popular constitution.

The Hundred Days.

The army at once saluted him again as its emperor; France with a spontaneous plébiscite restored him to his throne, and Louis XVIII. fled to Ghent. Napoleon entered Paris amidst delirious transports of delight. Cooler reflections soon followed, when the declaration of the allied sovereigns was heard, and troubles began in the old royalist districts. Nor were men better pleased when it was seen that Napoleon returned at once to his old despotic manner of governing; signs of alienation showed themselves; the allied armies drew towards the frontiers of France. Blücher, with his Prussians, came down to join Wellington, who had landed in Flanders, and Napoleon hastened up to prevent their union. He sent Ney to encounter and check the English, while he himself tried to destroy the Prussians. He found them at Ligny, where, on June 16, 1815, he defeated them, though Ney was unable to force Quatre Bras, so as to be ready to fall on their flank and complete the rout. The consequence was that Blücher drew off his army unbroken to Wavre; and Wellington, to keep near him, also fell back to the village of Waterloo, where he could both cover Brussels and await the Prussians. There, on the 18th of June, 1815, took place the battle of Waterloo, in which Napoleon and Ney made their final effort for the empire. The object of Wellington was to hold his ground till Blücher could come up; the object of Napoleon was, by detaching Grouchy towards Wavre, to hinder the Prussians, till he could crush the English. Grouchy, however, let himself be deluded by a single Prussian corps, while Blücher slowly made his way towards Waterloo: and Wellington's Englishmen and Germans, with heroic tenacity, had held their ground against all attacks. In the afternoon the Prussians began to come up, and after the repulse of the French guards towards evening, Napoleon knew that all was lost. He entrusted his shattered army to Soult, and fled headlong to Paris. There, finding hope all gone, he once more abdicated, on behalf of his son. He withdrew to Rochefort, hoping to find means of escaping to America; but the English cruisers rendered this impossible, and he threw himself on the generosity of his hated foes. He was taken on board the Bellerophon, and conveyed as a state prisoner to the island of St. Helena, where he lived, the mere shadow of his former self, in a hated and inglorious ease, till death released him in 1821, at the age of fifty-two. 1815.

The character of Napoleon.

There is a saying attributed to Talleyrand, which hits the prominent characteristics of Napoleon's nature: — "What a pity that so great a man was so ill brought up!" For he had genius and no breeding; he never shook off the adventurer-element in his life; nor had he that high sense of honor, truthfulness, and gentleness, which go with true nobility of soul. With a frame of iron, Napoleon could endure any hardships; and in war, in artillery especially and engineering, he stands unrivalled in the world's history. His quick intelligence was altogether scientific in the colder and harder aspects of scientific knowledge. He took no interest in moral sciences or history, or the brighter works of imagination. Throughout we discern in him the precisian, the despot on exact principles. Even when he unbent among his intimate friends, his was "a tyrant's familiarity," with a touch of Oriental ferocity under it. He was ever on the watch against rivals, ever full of distrust, treating great men with a false and feline grace of manner, which seemed to be expecting a surprise. No one was ever so naturally untrue as he; he never hesitated to lie and to deceive; the most important despatches he would readily falsify, if he thought there was anything to be gained by it. There was in him a swiftness of intelligence which answered to his hot and passionate nature; the true and solid balance was wanting. He could not rest, and knew not when he had achieved success. And this was immediately connected with another Oriental quality, his vast and unmeasured ambition, and the schemes and dreams of a visionary, which led him to the greatest errors of his life,—his expedition to Egypt and his hopes of an Eastern empire, and his terrible attack on Russia. The same largeness of vision showed itself in his endeavors to reconstruct the map of Europe, and to organize anew the whole of society in France. He could have in his mouth the phrases and cries of the 18th century, and with them he knew how to charm mankind. Yet with this gift, and with his amazing power of influencing his soldiers, who sacrificed themselves in myriads for him with enthusiasm, there was a coldness of moral character which enabled him to abandon those who had given up all for him, and made him show shameless ingratitude towards those who had done him the greatest services. We can gauge a man's character by his complaints against others, for those complaints are always the reflection of his own characteristics. Napoleon was ever inveighing against the deceit of Alexander, the treachery of the Germans, the perfidy of Pitt, the warfare of savages which he had to face; and the phrases represent the worst elements in his own character. He was, in fact, the successor and representative of the "18th century despots," the military follower of the Pombals, the Arandas, the Struenzees of the past. He had their unbalanced energies, their fierce resistance to feudalism and the older world, their ready use of benevolent and enlightened phraseology, their willingness to wade through blood and ruin to their goal, their undying ambition, their restlessness and revolutionary eagerness to reorganize society. Like them, with well-sounding professions, he succeeded in alienating the peoples of Europe, in whose behalf he pretended to be acting. And when they learnt by bitter experience that he had absolutely no love for liberty, and encouraged equality only so long as it was an equality of subjects under his rule, they soon began to war against what was in fact a world-destroying military despotism. When the popular feeling was thoroughly aroused against him in Spain, in Germany, in England, his wonderful career was at last brought to an end.

VII. The Restoration.

The royalist reaction.

While Napoleon had held together the enthusiasm of the French army, and had flattered the national vanity, and had raised a bulwark between the peasant tiller of the soil and his ancient oppressor, the Bourbons came back, having learnt nothing, and under auspices painful to French feeling. The peasant suspected them of wishing to restore noble privilege with the ancient throne; the army was suspicious if not hostile; the national feeling was vexed by the patronage of the victorious hosts of Russia, England, and Germany. Paris was treated by them as a conquered capital, the whole country was garrisoned by their armies, and Louis XVIII. was little but their instrument and dependant. The royalist reac-

1815-1824.

The Holy Alliance.

tion was violent, though not cruel; the new legislative chambers proved vehemently Legitimist; Fouché, who had hitherto successfully held his ground, come who might, in his dangerous department of the police, now fell and was exiled; Talleyrand also was got rid of; and the duke of Richelieu, grandson of that hoary old sinner who had been at the right hand of Louis XV., became chief minister. Meanwhile, the congress of Vienna had at last (20th November, 1815) dictated its terms of peace to France. The "Holy Alliance," of the emperors of Russia and Austria and the king of Prussia, that league of monarchs against the liberties of Europe, compelled France to pay a huge indemnity, to surrender her Rhine fortresses of Philippeville, Sarrelouis, Marienburg, Landau, and Huningen; the frontier of France was to be garrisoned for five years by a foreign army commanded by a foreign general, and paid by France; this period was cut short in 1818 at the Congress of Aix-la-Chapelle.

Louis XVIII., who was no mere reactionary, allowed little blood to be shed; Labédoyère, who had led the army in its rally round Napoleon in 1814, and Marshal Ney were the only victims. Murat, taken in an attempt to recover his throne of Naples, was shot by the Italians.

New arrangement of parties.

As the chamber of deputies seemed determined to push the reaction to its utmost limits, Louis XVIII. dissolved it, and, declaring that he would rule constitutionally in accordance with the charter, rallied round himself all the moderate party, headed by the duke Decazes. Power came now into the hands of the middle classes, and in 1818 the burgher party ruled. It was supported by the newly-risen *Doctrinaires*, men who wrote for the press, and began the modern career of French journalism. The chief of these were De Barante, Guizot, and Villemain; on one side of them were the extremer royalists, headed by the count of Artois; on the other side stood the new party of the *Independents*, from whom sprang the men of the "three days of July." Between these Decazes kept up the new "système de bascule," the balance-system, as it was called, allowing now this side and now that to taste the sweets of power, and to make some pretence to party-government. In 1820, however, the murder of the duke of Berri, second son of the count of Artois, gave the ultra-royalists an excuse for freeing themselves from a man who kept them somewhat in order.

The efforts of the reactionists.

Using the excitement caused by the assassination, they compelled the king to dismiss his favorite minister, and seized the reins of power. They at once modified the constitution in such a way as to secure their majority in the chambers, and prepared to carry matters with a high hand.

Just at this time the extravagant conduct of the reactionary Bourbon princes of Spain and Italy had aroused insurrection and armed resistance everywhere. The people of Spain and Naples declared against arbitrary government, and were at once attacked by those "champions of order," the sovereigns of the Holy Alliance. At their bidding Louis XVIII. also declared war against Spain; the French Government, being now entirely guided by the count of Artois, was thoroughly in harmony with all that was repressive and reactionary in Europe. In the spring of 1823 the French army, commanded by the duke of Angoulême, the eldest son of the count of Artois, crossed the Bidassoa and entered Spain. No serious resistance was met with except at Cadiz, and the triumph of the French arms was mercilessly used to crush the Spanish liberties. Ferdinand VII. of Spain returned to Madrid, and ruled henceforth as most absolute, most Catholic sovereign. The duke of Angoulême was thought by his success and personal bravery to have aroused in the French army an enthusiasm for its old Bourbon masters; reaction ruled supreme in France; the Jesuits were conspicuous in their delight; and the system of influences, corruption, and manœuvres, so long the disgrace of French elections, sprang at once into full bloom.

Character of Louis XVIII.

In September, 1824, Louis XVIII. died, with his last breath urging the count of Artois to rule prudently and in accordance with the charter. He was one of the best of the Bourbons, a man of ability and learning, fond of literature and science, moderate and loyal in opinion and act,—a far better man than those who surrounded his old age, and drove him into reactionary courses which he could not approve. His successor, the count of Artois, was a very different man. He had been the chief cause of the misfortunes of the monarchy in the Revolution, and had both the fine manners and the faults of the old régime. He was the fourth son of the dauphin, and brother of Louis XVI. and Louis XVIII., and now became king under the title of Charles X. It was speedily seen that now the ultra-royalists would have none to check them; the new monarch was bigoted, stupid, ignorant; from the scandals of his early life to the devotion of his later days there had been but a step; the sublime is not so near the ridiculous as superstition is to immorality. He was regarded as a mere tool of the Jesuits, and his reign was but a struggle against the more liberal instincts of his country. Now, if ever, it was seen that the old Bourbons "could never learn and never forget." In 1827, the national guard, which had shown itself too free in its cries, was disbanded; a new chamber of deputies was, in spite of all efforts, strongly opposed to the policy of the king's Government; a more moderate cabinet followed.

1824-1830.
Charles X.

War with Turkey.

In this year England, France, and Russia joined to put a stop to the quarrel between Turks and Greeks, and their combined fleet under Sir Edward Codrington won the battle of Navarino, and ruined the maritime power of Turkey (20th October, 1827). Early in 1828 the French occupied the Morea, and ere long the independence of Greece was accepted by the Ottoman Porte, and a new national life began in Europe.

The reactionary attempts of Charles X.

In 1829, finding the new ministry too moderate for him, Charles X. dismissed it, and gave the seals to Prince Polignac. This meant war to the knife against all constitutional liberties in France, and was the return to power of all that Frenchmen most feared and disliked. The chambers, supported by popular feeling, stood firm, and carried an address to the throne, which declared that the new ministry did not enjoy their confidence. Thereupon the chambers were dissolved, and the fresh elections which followed were a decisive struggle between liberty and despotism. The success of the expedition to Algiers, in which France vindicated her honor by the capture of the robber-city and the complete defeat of the dey, while she acquired for herself her most flourishing and important colony, brought no relief to the Government in its contest against the people. The new chamber was stronger against the ministry than the late chamber had been. Then Charles X. suddenly attempted the usual *coup d'état*, and assumed a kind of provisional dictatorship, which produced at once the five famous ordinances of St. Cloud (25th July, 1830). These were—(1) the suspension of the liberty of the press; (2) the dissolution of the new chamber of deputies; (3) a new system of election, so as to secure absolute power to the king; (4) the convocation of a new chamber; (5) some ultra-royalist appointments to the council of state. At this time a young journalist from Marseilles, Thiers, was editor of the *National;* under his fearless leadership the "fourth estate" made its first collective revolt against illegal power, and signed a vigorous protest against the ordinances. It is the beginning of that wholesome influence of the press on modern politics of which the history has yet to be written, because its limits have not yet been reached. Men waited breathlessly to see what steps would follow such an insurrection of opinion against power. On the 27th of July it was announced that Marshal Marmont, although he disapproved of the measures agreed on, and did not sympathize with the five ordinances, had been charged with the defence of the capital. Then insurrection broke out at once, and the "Revolution of the three days of July" began. On the 27th the barricades raised by the citizens were forced and the streets cleared; on the 28th the insurgents, not abashed by their defeat, seized the Hôtel de Ville, and hoisted the tricolor. Marmont, who urged pacification, was ordered by Charles, who kept out of the way, to crush all opposition ruthlessly; before evening his troops had retaken the Hôtel de Ville, and most of the important positions. Again he urged moderation on the king, and the leaders of the revolt offered to lay down arms if the ministers were dismissed and the five ordinances withdrawn. Charles, however, would listen to nothing, and sent orders to Marmont to persevere. On the 29th, however, two regiments fraternized with the people; and Marmont, paralyzed by their defection, and by suspicions as to the fidelity of

The ordinances of St. Cloud.

M. Thiers begins his public life.

The three days of July.

1830.

other troops, gave way. The populace rushed into the Louvre and the Tuileries, sacking and destroying the insignia of Bourbon power. They neither stole nor murdered. Charles X. at St. Cloud now offered all he had refused the day before; of course it was a day too late. Paris had triumphed over the reaction, and the unteachable older Bourbons had to go. The veteran Lafayette was once more named chief of the national guard;—how much had France seen and done since he had first girded on that same sword! The tricolor flag and cockade reappeared everywhere. Thiers and Mignet issued a proclamation, urging the Parisians to transfer the crown of France to the duke of Orleans, who came up to the capital at once, and declared his ready acceptance of the office of lieutenant-general of the realm. In his first address he assured France that thenceforward the charter should be a reality.

Charles X. abdicates.

On the 2d of August, 1830, Charles X., finding that the army had deserted his cause, and that necessity was on him, abdicated in favor of his young grandson Henry duke of Bordeaux, son of the duke of Berri; the dauphin, who was childless, also renounced his own claims on behalf of his nephew, who was then ten years old.

The count of Chambord.

This last representative of the older Bourbons, the last hope of the legitimists of France, lives still, cherishing his claims, and known to modern history as Henry, count of Chambord. Charles withdrew to England, where he died in 1836.

Louis Philippe succeeds.

The day after his abdication Louis Philippe, duke of Orleans, the representative of the Orleans branch of the Bourbons, son of Philippe Égalité, and great-great-grandson of the Regent Philip, opened the session of the chambers as lieutenant-general of the realm. The charter was carefully revised in a liberal direction, and the crown was offered to the duke and his heirs-male with the title of "King of the French." On the 9th of August, 1830, the new constitutional monarch, ruling, not by divine right, nor by territorial possession, but by the will of the sovereign people, "king of the French," not "king of France,"[1] king of the tricolor, not of the lilies and the white cockade, took oath faithfully to observe the amended charter. The era of constitutional monarchy seemed at last to have begun in France; men thought that the fires of the Revolution had died down, that republicanism was discredited, while the follies of the older Bourbons, on the other hand, had been shown to be no longer possible.

The new constitutional government.

"The days of July" were hailed as heralding a new epoch of moderate politics; the "citizen-king," who had carefully shunned the reactionary party, and was by family tradition head of the liberal branch of the Bourbons, should lead France along a new course of decorum and material prosperity. It should be the reign, not of noble and priest, nor of grim artisan and sans-culotte, but of broadcloth burgher, a rule of common-sense and constitutional use. Lafayette, who in these later days had sided much with carbonari and republicans, was greatly blamed for lending the support of his name to any monarchical system of government. His excuse lay in his belief that, for the time at least, the republicans were but a small minority of the people. The events of subsequent years seemed to prove him right; yet in the end the stronger beliefs and energies of republicanism were fatal to the throne. Peace at home and abroad, and a constitutional government, allied with such countries as also enjoyed the blessings of a moderate form of polity, especially with England,—these were the chief aims of the reign, as it was worked out by the two antagonistic statesmen, the rivals Thiers and Guizot.

Changes in Europe.

This revolution of the "three glorious days of July" was a part of a general movement throughout a large part of Europe; for men were weary of the triumphs of reaction. In England these were the days of the Reform agitation which is indissolubly connected with the name of Earl Russell. In Belgium the news of the three days led to a violent insurrection, and the Belgians, who hated the union with the Dutch, threw them off and declared themselves independent; they bestowed a constitutional crown on Prince Leopold of Saxe-Coburg. When the Dutch refused to deliver up Antwerp and let the Scheldt run free, England and France combined to help the young kingdom; a strong French army soon forced the Dutch to evacuate Antwerp citadel.

1830-1840.

Disturbances in France.

At home the country was still uneasy; both legitimists and republicans were anxious to embarrass the Government. There were troubles in Paris, at Lyons, at Grenoble, and in La Vendée, where the romantic duchess of Berri kept up the hopes of the old Bourbon party. After a time the Government succeeded in capturing her, and then it came out that she had been for some time secretly married to an Italian gentleman; this, and the birth of a daughter, discredited the legitimist cause completely; the duchess was allowed to retire in peace to Palermo. The disturbances at Paris and Lyons were also put down, and their chief instigators punished. After this the efforts of the dissatisfied took the form of attempts at assassination, and this in turn led in 1836 to the passing of the Laws of September, which treated press offences with severity, and regulated strictly the procedure of the law-courts.

Two parties in French politics.

In this period could be seen a more marked divergence of parties, even among the Orleanists themselves. On the one hand there were the more conservative or reactionary men; on the other the upholders of the English theory that "the king reigns, but does not govern." At first Louis Philippe had chosen his Government from the former party, which, at the beginning of the reign, had embraced not only Casimir Périer, the head of the Government, but Guizot, Thiers, and other men of name in politics and literature. Casimir Périer, vigorous in combat, but not a large-minded statesman, was carried off in 1832 by cholera, then raging fearfully in Paris; and soon after that time the life-long feud between Guizot and Thiers began.

Thiers and Guizot.

A series of Governments followed one another in quick succession, and without stability; at last the cabinet, headed by Marshal Soult, having proved unable to hold its own, a new ministry followed, of which Thiers was the head (February, 1836). The ambitious little statesman, with the fire and heat of the south in him, advocate, newspaper editor, historian, and politician, seemed now to have reached his goal. His ministry, however, lasted but a very few months. He wanted to interfere in the affairs of Spain, while the king refused to change his policy of non-intervention; the cabinet broke up, and Count Molé, with Guizot as minister of public instruction, succeeded. The new Government had to face the anger of France at the failure of French troops in Algeria before the hill-fort of Constantine, and the agitation which succeeded the strange attempt (October, 1836), of Prince Louis Napoleon to arouse imperialist echoes among the troops at Strasburg. Though, when he showed himself and read a proclamation to the soldiers, many replied with shouts of "Vive l'Empereur," the bulk of the troops refused to listen, and he was arrested with his companion, a M. Persigny, and sent on to Paris. The Government treated him leniently, and allowed him to leave France for New York. In 1838 Count Molé, finding the state of parties very uneasy, dissolved the chambers, and fresh elections followed.

Parties in the Assembly.

There had been four chief parties in the Assembly,—the Right, led by the famous conservative lawyer Berryer; the Right Centre, under guidance of Guizot; the Left Centre, headed by Thiers; and the Left, led by Odillon-Barrot, formerly president of the society "Aide toi, le ciel t'aidera," an association formed to advance purity and freedom of elections, and a chief motive-power in the revolution of July. This last party, till 1840, was in constant opposition to Government. It was felt that the king, who was obstinate in his opinions, and not very scrupulous, had for some time past been interfering more than was wholesome in electioneering matters; the system of help to official candidates, the snare of French politics, took large development under him. The elections resulted in a majority for Molé and the Government. The other parties, however, made a coalition against him, which, under the leading of Thiers and Guizot, overthrew the ministry in 1839. The parties, however, did not agree well after their victory; the king was not cordial with them, and chose his ministers so as to exclude the three victorious leaders. In 1840 the king's friends were again defeated. Thiers again became chief minister, and Guizot was sent as ambassador to St. James's, where he had a very difficult part to play, in consequence of the state of the Eastern question. The rebellion of Mehemet Ali, the

Eastern affairs.

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[1] It is a mistake to lay stress on this change of style. In the *Acta Pacis Westphalicæ* (1648) even Louis XIV. is actually styled "Roi des François," not "Roi de France."

able viceroy of Egypt, against the sultan had aroused no small excitement in Europe. Mehemet was well known in France, where his adventurous career had attracted much attention. Though the French and their allies had destroyed his fleet at Navarino in 1827, he had since (1831–1833) acquired the government of Syria as well as that of Egypt, by the energy of his son Ibrahim Pasha. When the sultan in 1837 endeavored to reduce his power, he again declared war against him, and Ibrahim once more defeated the Turks, securing Syria for his father. Now arose a great difference between France and England. The French Government wished that both Egypt and Syria should be finally guaranteed to Mehemet; the English Government declaring that such a step would be fatal to the Turkish empire, insisted that Syria should be, with some small exceptions, restored to the Porte. In July, 1840, England formed a quadruple alliance with Russia, Austria, and Prussia, without communicating at all with Guizot till after the treaty had been actually signed. Napier speedily bombarded and took Beyrout, while Stopford blockaded Alexandria. In one short campaign the Egyptians were easily cleared out of Syria, and Mehemet Ali, acquiescing in the power of the stronger, secured his position in Egypt, while he finally restored Syria to the Porte.

Irritation in France.

In France the irritation was extreme. The nation had watched Mehemet's regeneration of Egypt, a country in which, ever since Bonaparte's expedition, France had seemed to have a special interest; it was a great shock to her to see her diplomacy rudely foiled, her sympathies neglected, her strength unemployed. The restoration to France in 1840 of the ashes of Napoleon, a rash act due to Louis Philippe himself, woke many a slumbering echo of the old national pride; Napoleon, it was urged, had never let his country fall, as the present Government had done, out of the foremost place in the councils of Europe. The second attempt of Louis Bonaparte to win over the garrison of Boulogne, in spite of the absurdities of the tame eagle, and the utter failure of the venture, added not a little to the popular uneasiness. By shutting up the adventurer in the castle of Ham, the Government made him a martyr, and roused much dormant sympathy for him. The ministry accordingly fell, and Guizot, under the nominal presidency of Marshal Soult, became the real head of the new Government. The step was far from allaying the strong feeling in France; men accused Guizot of having played the country false while in London; his bitter antagonism to Thiers seemed to them to be the cause of the humiliation of France. For the moment, however, the only result was the fortification of Paris, which was begun in 1841.

Fortification of Paris.

The Pritchard affair.

The annals of France were now tranquil, under the cold administration of Guizot; party spirit seemed to have died down; the "Pritchard affair," arising out of the occupation by France of Otaheite, in accordance with a treaty in 1842, aroused again the slumbering irritation between France and England. The English Government had not objected to the treaty between Queen Pomare of Otaheite and the French Government; Mr. Pritchard, however, consul, missionary, and medical man to the queen, believing that the treaty was bad for the natives, had succeeded in persuading Queen Pomare to repudiate it, and to call on England to support her. Thereon in 1844 the French arrested him, sent him back to England, and occupied the island as its protector. The success of the French arms in Africa also angered the English; Marshal Bugeaud had vigorously attacked and punished the emperor of Morocco for giving refuge and support to Abd-el-Kader, and the defeated emperor was obliged to sue for peace (September, 1846). In 1847 Lamoricière succeeded in capturing the picturesque chieftain who had caused France so much trouble, and sent him as a prisoner to France. Lastly, the vexed question of the Spanish marriages, in 1846, in which Louis Philippe succeeded in reallying the Bourbons of France and Spain by a double marriage, caused very strong feeling in England; it was felt that Guizot had broken his word in the matter, and that France was taking unfair means of avenging herself for the affront of the quadruple alliance of 1840.

The gloomy outlook in 1847.

So things stood when 1847 opened with gloomy aspects for the French Government: irritation, want, the feeling that the Government had done little to lessen the commercial and agricultural distress; the desire of a more popular and perhaps more brilliant rule; the distrust of Guizot's policy, as shown in the risks of the Spanish marriages, by which he had endangered the peace of France for the sake of illusory dynastic advantages; the consciousness that the king's feelings were not friendly to the people, that his government was selfish, and that he did not hesitate to use corruption and influence in elections,—these things all made affairs seem unsettled and precarious. Guizot's policy in the affair of the marriages, in his support of the Swiss Sonderbund, which was the resistance of reactionary against popular principles in Switzerland, his appeals to the treaties of 1815, his friendly attitude towards Metternich and Austria, his divergence from the liberal views of Lord Palmerston, his dislike for the patriots of Italy, shocked and alienated all liberal opinion in France, and made the minister completely unpopular. The rôle of prudence at home and peace abroad, never an heroic one, had been abandoned by Guizot for a system which endangered peace with the neighbors of France and irritated the passions of party at home. Trickery and subterfuge seemed to rule in high places.

Guizot's unpopularity.

VIII. The Second Revolution.

The agitation of the country at first was seen chiefly in speeches made at fervid banquets. When the session of 1848 opened, the opposition, led by Odillon-Barrot, showed itself strong and resolute; the interference of Government against a popular banquet in Paris led to the outbreak of the Revolution (22d February, 1848). On the 23d the national guard took part with the populace against the troops, and the soldiers, unwilling to attack them, hesitated, and the day passed by. Guizot now yielded, and sent in his resignation; it was, however, too late; that evening, the troops having fired on and killed some of the mob, a ghastly procession with the bodies of the slain passed through the streets. The excitement redoubled; the troops refused to act; Louis Philippe even called on Thiers to form a liberal ministry with Odillon-Barrot. A proclamation was issued stating that the troops were ordered to withdraw. Forthwith the regular soldiers laid down their arms, and the people with the national guards marched on the Tuileries. Louis Philippe now abdicated in favor of his grandson the count of Paris, and, assuming the name of Mr. William Smith, closed an inglorious reign by an inglorious flight in a hackney cab. He reached England, and died there in peace some two years later. Writers have called the Revolution of 1848 a mere trick, and have wondered how so mean an effort could have overthrown a constitutional and organized government. The truth is that France was weary of such a rule, that Paris wanted a republic, and that in the country generally the citizen-king was unpopular. In the chamber of deputies the republican party at once took the command, and established a provisional Government, which immediately proclaimed a republic, to be ratified by a popular vote; to be based on the sovereignty of the people; to re-echo the old watchwords, "liberty, equality, fraternity;" to secure a pure and liberal administration. The presidency of the new Government was given to Dupont de l'Eure; Lamartine had the portfolio of foreign affairs; Cremieux, justice; Ledru-Rollin, the home-office; Arago, the admiralty; Bédeau, the army; Carnot, education; Bethmont, trade; Garnier-Pagès was named mayor of Paris; Louis Blanc, and three others, were first named as secretaries, and soon after became actual members of the Government. The decree which established the tricolor flag, with a red rosette, indicated, as trifles often will do, the position taken up by the new administration. They would not accept the red flag of the Parisian communists, which Louis Blanc wished to take as symbol of a thorough republicanism; they added the red rosette to express a certain sympathy with that side; they kept the tricolor as the flag of the old Revolution. One step—and it was a great blunder—they did make under the influence of Louis Blanc: they issued a decree promising to provide work for all,—promising in fact to suspend the first laws of political economy on behalf of the working man.

The revolution of 1848.

The republic of 1848.

The republic at once established.

Though the revolution had been a thorough Parisian surprise at the moment, all France was ready to accept it. From every side cheerful acquiescence came in; the army approved; the clergy were guided by the liberal archbishop of Paris, M.

1848-1852.

Affre, who three months later lost his life in the sacred attempt to stay bloodshed in the streets of the capital; politicians either were silent or joined the Government; the adventurer of Strasburg and Boulogne, who had escaped from Ham in 1846, offered his services to France, and was politely sent back to England.

Louis Bonaparte.

In April the elections to the new constituent assembly took place. They returned a body of, on the whole, moderate republicans, not favorable to the extremer views of Paris, and appointed an executive commission of five members, Lamartine, Arago, Garnier-Pagès, Marie, and Ledru-Rollin. A serious outbreak was easily quelled in May; in June, however, things took a more alarming turn. The reaction, which had already begun in France, was supported by the conviction of moderate men that the "national workshop" system, a practical socialism, was too burdensome for the finances of the state, and that the country generally would not long subsidize the Parisian artisan. A decree ordering a portion of the working men to be enrolled in the army led to the terrible revolt of eastern Paris.

The revolt of Paris.

The Government declared the town to be in a state of siege, and entrusted General Cavaignac with a dictatorship. For four days the battle of the barricades raged; the artisans did not yield till the last barricade of the Faubourg St. Antoine had been stormed. Then Cavaignac laid down his dictatorship and was named president of the council, with right of naming the ministers. The national workshops were absolutely closed on the 3d of July, and thus the republic freed itself from the dictation of Paris. After the May disturbance the leaders of reaction had begun to pluck up courage, and to offer themselves for the elections; Thiers was returned for the Lower Seine, and became its political leader; Changarnier was its military chief. Louis Bonaparte was also among the elected. He veiled his ambition under popular phrases, and, as had been seen before, a Bonaparte made ready to pass into absolute power by an alliance with the people and a seeming deference to its sovereignty. "My name," he said, "is the symbol of order, nationality, and glory."

The new constitution.

The Assembly next proceeded to do its work as a constitutional body, and organized the Government thus:—A president of the republic, elected for four years, and then not re-eligible till after four years more; a council of state, named by the assembly for six years, and charged with the drafting of all public acts, and other honorable functions; a legislative assembly of 750 members. The date of election of a president was fixed for the 10th of December. The true republicans failed to support their man, General Cavaignac; they also left Lamartine entirely out, in spite of his honorable services.

Louis Bonaparte elected president.

The instincts of the nation turned towards one who bore the charmed name of Bonaparte, and the prince-adventurer was elected by a vast majority of votes, nearly five millions and a half supporting him against less than one million and a half who voted for Cavaignac. Thus the "Napoleonic idea," strong in the country-places, prevailed over the moderate republicanism of the Assembly, and the wishes of the chief towns of France. The new president was formally proclaimed, and took oath of office on December 20, 1848.

His first acts.

The first act of the new Government was the overthrow of the republic of Rome, and the military restoration of Pius IX. By this the president declared himself hostile to all the liberal movements of Europe, and won the firm gratitude and allegiance of the Catholic clergy of France. Before Louis Bonaparte had been in office a year, it was seen that he was preparing to move in the direction of absolute power. Stormy debates in the Assembly took place; a law was passed limiting the suffrage, as it was seen that in the existing temper of the country the ignorant peasant-vote was at the mercy of adventurers. Discussion also followed as to a revision of the constitution of 1848. At last, on December, 2, 1851, the prince-president, guided by a group of friends and brother-conspirators, ventured on his famous *coup d'état*, and swept away the whole existing fabric of the constitution.

The *coup d'état* of 2d Dec., 1851.

In the most lawless manner sixteen prominent members of the Assembly were arrested, among them Cavaignac and Thiers; the Assembly itself was forcibly dissolved, universal suffrage restored, and a *plébiscite* on the new form of government was appointed to follow at once; the capital was placed in a state of siege; the council of state dismissed. A new ministry was also formed of the chief members of the successful conspiracy,—Morny for the home-office; St. Arnaud for war; Fould, finance; Rouher, justice.

1852.

Constitution of 1852.

A project for a tenure of the presidency for ten years, with ministers responsible only to the president, a council of state to draft and prepare laws, a legislative body, and a conservative senate,—this was the new constitution of 1852. It was clearly a reminiscence of that form of government which led to the first empire. Outbursts of despairing resistance in Paris were sternly put down, with brutal severities, which aimed at striking terror into the capital; the men round Louis Bonaparte did not want for vigor; they had won power by conspiracy, and did not hesitate to keep it by a massacre. The new constitution was accepted by an overwhelming majority; it seemed as if the Napoleonic idea was omnipotent in France. The new government was, like that of the great Napoleon, the union of strong and arbitrary rule with an appeal to the ignorant passions of the populace. The burgher world acceded to it, because it was strong, and promised order and hopes of material prosperity, and because it was scared and puzzled by the fitful appearances of the "red spectre" of eastern Paris.

Napoleon III.

Little trouble did the successful party take about the remaining step. The high tide of the popularity of Louis Bonaparte was still running up in flood; and in November, 1852, an almost unanimous vote (7,824,129 against 253,149) accepted him as hereditary emperor of the French under the name of Napoleon III. Before the end of the year he made solemn entry into Paris.

IX. The Second Empire.

The second empire.

The second empire lasted from November 4, 1852, to September 4, 1870, a period of nearly 18 years. It was openly modelled on the first empire, and Napoleon III. never forgot that he was his uncle's nephew. His mother, the ex-queen of Holland, was Hortense Eugénie de Beauharnais, daughter of the empress Josephine by her first husband, the viscount Alexandre de Beauharnais; the emperor married her to his brother Louis Bonaparte in 1802; and her son Louis was born in 1808.

Character of Napoleon III. and of his reign.

He was now forty-four years of age, a man of no dignity of moral character, ambitious and unscrupulous, but somewhat wanting in nerve; far better than the adventurers who surrounded him; a man of very considerable clearness of vision, who did his utmost to develop the home-prosperity of France, by sweeping away the barriers which wrong-headed Governments had placed on commerce, and by introducing the new doctrines, strange to French ears, of free trade, which he had learnt to admire by seeing their applications in England. His government was frequently, almost incessantly, involved in wars; yet the emperor himself was doubtless sincere in proclaiming his wish for peace. "The empire," he said, "menaces no one; it desires to develop in peace and full independence the vast resources it has received from heaven." It is but one of the inevitable results of a bad tradition that he, like his predecessors, hoped to succeed in securing prosperity to France by constant interference, and by making the nation feel the presence at its head of an irresponsible yet beneficent master. At the same time this ostentatious activity assured labor to the restless artisans of the great cities; towns were half rebuilt; Paris especially, felt this malign benevolence, which, while it fed the workman, made him destroy his own means of resistance to government,—for the rebuilding of Paris by Haussmann was planned so as to drive great and straight military roads through all the disaffected quarters of the north and east. Railways, canals, harbors, public buildings, above all, new churches and old, owned the imperial hand. If, as must be granted, this lower empire was based on popular ignorance and plentiful bloodshed and terrorism, both in Paris and in the provinces, it must also be conceded that the emperor himself, dreamer as he was, was heartily anxious for the welfare of France. He was unfortunate in his associates, and perhaps also in the beautiful lady he chose as empress.

When the second empire began, the sovereigns of Europe thought that republicanism was gone for ever; they recognized the new government of France with some cordiality. England came first—for in England the unmistakable ex-

1852–1856.

Marriage of the emperor.

pression of the popular will was regarded just as the result of a general election at home might have been; the vote of the people had expressed their wishes clearly, and England was ready to accept their views as to their own affairs. It was noticed that Prussia was unfriendly towards the new government; and when the emperor, anxious to secure the hereditary succession promised to him by France, looked round him for a wife, his proposal to wed a Hohenzollern princess met with a marked rebuff. He had before failed to win a Swedish princess; he finally chose for himself the handsome Eugénie de Téba, a Spanish lady, who had already been conspicuous for her beauty at his court. France was divided in mind respecting her; her appearance won men's hearts; the national vanity was vexed at the rebuffs, while it was pleased to say that the emperor had disdained royal and formal alliances in order to choose the lady after his own heart; and lastly, there were not a few who grumbled that he ought not to have slighted the ladies of France by selecting a Spaniard. Anyhow, the young empress bore him a son, the prince imperial, on whom rested all the hopes of the new dynasty. For the rest, her extravagant and frivolous tastes in dress and habits set a very bad example to a nation far too willing to copy it; and her influence and advice were invariably on the unlucky side. She was a devoted Catholic, and to her counsels are due some of the worst mishaps of the reign.

The Crimean War.

In 1854 began the first war of the second empire,—the first denial to the famous utterance of Bordeaux in 1852, "L'empire, c'est la paix," which had enlisted the warm partisanship of commerce and finance. The large and ambitious schemes of the czar Nicholas against Turkey, "the sick man" of that day, alarmed all Europe; the dispute between Russia and the Porte as to the holy places was referred to a conference at Vienna, which proposed to solve the difficulty on the lines of the treaty of 1841, which had placed Turkey under the guarantee of the five great powers. Before diplomacy had got to work the Russians had invaded the Turkish territory; the Anglo-French fleet had moved up to Besika Bay, to be within call of Constantinople, and the Russian fleet (30th November, 1853) had destroyed the Turkish ships at Sinope. War, however, did not openly break out till the next spring. In April a treaty of alliance was signed between France and England, who were afterwards joined by the king of Sardinia, while Austria and Prussia also guaranteed the possessions of each other; the imperial guard was re-established, and an army of 60,000 men, one-third English, two-thirds French, set sail for the Black Sea. After halting first at Gallipoli, then at Varna, the allied fleets and armies set sail for the Crimea, and landed under protection of the ships near the mouth of the river Alma. Thence they marched along the coast towards Sebastopol, and came on the Russians strongly posted on the left bank of the Alma; on the 20th of September, 1854, the allies defeated the Russians there and took their position. Mentschikoff, who commanded them, withdrew into Sebastopol, round which the allies marched, taking up their quarters not far from Balaclava, to the south-east of the great fortress. Then began a siege which lasted through the winter; on October 25 the Russians were repulsed at Balaclava itself, by the wild charge of the English cavalry; on November 5 the allied armies won the battle of Inkermann, in which the English, who were defending the points attacked, bore the chief brunt of the fighting. It was not till June that the bombardment of the allies was effectual in producing the fall of some of the outworks. Sebastopol eventually fell on the 10th of September, in consequence of the storm of the Malakoff tower by the French troops. The French and Russians had now done enough, and the war speedily came to an end. The English would willingly have gone on till they had ruined the Russian navy; the emperor of the French was glad to be done with it. In 1856 the czar Alexander, who had succeeded Nicholas in the winter of the great siege, signed a treaty of peace, the terms of which had been agreed on at the Congress of Paris. The Black Sea and the Danube were neutralized; the Danubian principalities taken, in part at least, from under Russian protection; the sultan was admitted to the council-board of Europe. The peace did little for the real good of France, created a cold feeling between her and England, annoyed Prussia, and did not satisfy Austria. The war had not been very brilliant; the losses had been heavy; the appearance of Count Cavour at the congress had forecast the coming events of 1859.

The peace of Paris.

1858–1859.

The Orsini attempt.

The attempt of Orsini on the emperor's life in January, 1858, led the way. A man who had been among the carbonari, and had handled the explosive substances which lay like torpedoes in all the water ways of European politics, ought not to have been astonished that Italians, smarting under their country's wrongs, should try to avenge themselves on him for the expedition to Rome and the restoration of the papacy. To them Napoleon III. seemed to be a traitor, and the chief cause of their subjection to hateful and foreign masters. And Orsini's attempt was by no means the first. The French journals spoke gratefully of the fact that no Frenchmen were compromised in these attempts at assassination; the emperor himself, alarmed for his personal safety, and also sympathizing to some degree with the aspirations of Italy, began to think that he could secure himself from these secret and successive attacks only by satisfying the irritated feelings of Italy. The first result of it, however, was a period of terrorism at home, and of swaggering menace on the part of the army, unchecked by the Government, against England, that "lair of these monsters who are sheltered by its laws." England, disabused since the peace of its admiration for the imperial rule, replied by the volunteer movement, and the construction of defences on the coast. But the emperor's mind was not set on war with England. New Year's Day, 1859, disclosed to the diplomatic world his schemes against Austria, and showed that Italy would be the scene of warfare and change. The empress was known to be averse to a war which must be against the instincts of Catholicism. Prince Napoleon, who in January, 1859, married the princess Clotilde, daughter of Victor Emmanuel, king of Sardinia, was known to be in favor of an alliance with the Piedmontese for the liberation of Italy. The emperor, hoped to steer between the two; hoped to satisfy the Italians and to escape the alarms of conspiracy, and at the same time to satisfy the empress and the Catholic party by constructing an Italian federation of states under presidency of the pope. The current of affairs, the strength of the "doctrine of nationalities," the definite and heroic attitude of Italy herself, proved too strong for him. A federation in Italy, a federation in Switzerland, and a third in Germany, would have left France in the centre of the world, compact and powerful among weak and divided neighbors on every hand. This was the imperial policy; united Italy and united Germany destroyed the plan, and brought the empire with it to the ground.

The Italian War.

In July, 1858, Cavour and Napoleon had agreed on the terms of an alliance; Victor Emmanuel should be king of Italy, with possession of the north; Nice and Savoy, the cradle of his race, he agreed to surrender to France. With this understanding war began, after delusive talk respecting a congress, in April, 1859, Austria at the last moment forcing it on by ordering the cabinet of Turin to reduce its army and dismiss the volunteers. On the 3d of May the French Government also declared war, amidst the plaudits of Paris, and the enthusiasm of the army. The French at once entered Italy, by the Mont Cenis pass, and by sea, landing at Genoa. The emperor himself took the command in chief; King Victor Emmanuel placed himself under his orders. The affairs of Montebello and Palestro, in which the Piedmontese fought well, secured for France the safe passage of the Po. On June 4, the battle of Magenta, fought to open the passage of the Ticino, was won, after a very doubtful struggle, by the arrival of MacMahon, whom the emperor named marshal of France and duke of Magenta. The Austrians fell back, and the allies at once entered Milan. Baraguay-d'Hilliers pushed the Germans out of Marignano; and Garibaldi, with his chasseurs of the Alps, dislodging the Austrians from their positions round the Lago Maggiore, threatened their communications with Tyrol, their only sure line of retreat in case of ultimate disaster. Giulay, who commanded the Austrians, drew back within the Quadrilateral, as it was called, formed by the great fortresses of Peschiera, Mantua, Legnano, and Verona, a square within which, ever since 1815, the Austrians had been accumulating all their means of resistance. This Quadrilateral, well held, could effectually block the passage through North Italy; for Legnano stands on the Lago di Garda, which runs up into Switzerland, while Mantua is not far from the Po; an enemy venturing down southwards could never leave these great strongholds on his flank; their siege and reduction would give their holders time to recover from any disasters. To the attack of this strong position the allies now advanced; and on June 24 they met the Austrians to the west of the Mincio, and, therefore, just in advance of Peschiera and Mantua, in the broken ground which lies about the town of Solferino. The battle which then took place was fought with great gallantry by the allies, and some tenacity by the Austrians, who were on the defensive, and had the great advantage of the position, and of a thorough knowledge of the ground. French historians themselves allow that there was little strategy shown on either side: "At Solferino, as throughout the campaign, the command-in-chief was below its proper level." The defeat of the Austrians, without being crushing, was complete; they fell back to the neighborhood of Verona, the rally-point of the Quadrilateral, and the allies laid siege to Peschiera.

Battle of Solferino.

The treaty of Zurich.

These successive victories, and the release of the Milanese from Austria domination, had an immediate effect on the rest of Italy. The duke of Tuscany had fled, and his territories were occupied by French troops under Prince Napoleon. The duke of Modena, after Magenta, also made his escape, and his duchy proclaimed Victor Emmanuel in his stead. The same took place in Parma. The "Legations," the northern portion of the States of the Church, threw off the papal government, and joyfully proclaimed their adhesion to the national cause. A French fleet in July appeared before Venice, and the queen of the Adriatic was burning to throw off the Austrian yoke. Still, every one thought that the war was scarcely begun, and, considering the strength of the Quadrilateral and the proverbial tenacity of the Austrians under defeat, it seemed not unlikely that changes in the fortune of war might yet favor the reactionary cause, when Europe was astonished to hear that the two emperors, in a conference at Villafranca, had agreed on the bases of a peace. There should be an Italian confederation under presidency of the pope; Lombardy (with exception of Peschiera and Mantua) should be surrendered to Napoleon, who should present it to the king of Sardinia; Venice should be allowed to enter the Italian confederacy, though it was still to be an Austrian possession; the dukes of Tuscany and Modena were to be replaced; reforms to be introduced into the papal states; not a word about the south of Italy. These terms agreed on, *viva voce,* between the emperors without a single witness on either side, were ratified in October, in the treaty of Zurich. The result, for the moment, satisfied no one. Austria was humiliated by it; Italy disappointed, in the very moment of hope and triumph; Germany and England deemed both the war and the peace a high-handed proceeding; and France herself, in spite of the successes of her army, wished that the high-sounding promise of her emperor, "Italy free, from the Alps to the Apennines," had been more nearly fulfilled. Finally, military critics noted that the generalship of the war left much to be desired, and that the organization of the army was very far from perfect. Further changes, results as much of the force of ideas as of diplomacy or of war, were sure to follow before long. Ominous utterances and influences of the Ultramontanes in France heralded coming difficulties even before the conclusion of the peace of Zurich. The pope, Pius IX., guided by the Jesuits, threw himself into the arms of the reactionary party; and Napoleon saw good reason to give up his chimerical scheme for an Italian federation under papal presidency. He declared his intention of founding a great kingdom of Northern Italy, and announced that Savoy and Nice were to be united to France by way of counterpoise. The forms of a plébiscite were duly gone through in those districts; and the transfer took place shortly afterwards.

Garibaldi in Sicily and Italy.

Even this change of attitude on the emperor's part, coupled as it was with the continuance of the French garrison at Rome, and the cession of Nice and Savoy, was offensive to Italian independence. Garibaldi, with his noble band of volunteers, amidst the warm sympathy of all liberal Europe, landed in Sicily, and soon defeated the half-hearted supporters of the wretched Neapolitan Government; Naples and Sicily were at once united to the Italian kingdom. Piedmontese troops entered the papal territories, and won the battle of Castelfidardo; general Lamoricière, who commanded the Papalini in the battle, was soon after taken, when Ancona surrendered, and was sent back to France by the Italian Government. The victorious troops, leaving Rome and its French garrison on one side, joined the triumphant volunteer-army of Garibaldi. In February, 1861, Francis II. king of Naples, who was besieged in Gaeta, capitulated, and a new Italian parliament in the same month proclaimed Victor Emmanuel king of Italy. Rome alone was left out, the natural capital of the kingdom, defended from herself and from Italy by French bayonets. The political situation was indefensible.

Distant expeditions.

During these years France had also been engaged in distant expeditions; a Chinese war, in alliance with England, occupied her from 1858 to 1860; the capture of Pekin brought this war to an end. In Cochin-China, also, France had Spain as an ally, and closed an obscure if successful war with a treaty of peace in 1862. The Syrian expedition of 1860, undertaken in harmony with the other Christian powers, speedily reduced the sultan to reason, and a French occupation, which lasted till June, 1861, did much to relieve the oppressed Christians of that part of the Turkish dominions. Lastly, the affairs of Mexico, in which the empress, guided by her clerical tastes, took an active part, led to the intervention of the emperor on behalf of the archduke Maximilian of Austria; at first England and Spain, which also had grievances against the revolutionary Government of Mexico, joined with France. England, however, had little real interest at stake; Spain wanted to place a prince of her own on the Mexican throne; when it came to the point, France was left to carry out her schemes as she could. The whole affair ended in a terrible disaster for the archduke in 1867, and discredit and loss to the imperial Government. It was seen by the elections of 1863 that, while the peasant-vote remained true to Napoleon III., the towns, following the leading of Paris, and in spite of all official efforts, sent up a strong minority to the opposition. It was clear that the educated and thinking part of France was already weary of the second empire.

The Danish war.

Now broke out the Danish war, which was the beginning of the consolidation of Germany. In 1852 the conference of London had settled the succession to the Danish crown on the duke of Glücksburg, who had married a Danish princess; when Frederick VII. died in 1863 and Christian IX. succeeded to the throne, the Germanic confederation, which had never agreed to the arrangement, protested against the union of Schleswig and Holstein to the Danish kingdom. Holstein had always been a German duchy, and vigorous colonization had made South Schleswig in large part German in population. The Danish Government allowed the federal forces, commanded by Baron Halkett, a Hanoverian general, to occupy Holstein provisionally, while it refused them possession of Schleswig; Prussia and Austria, acting in concert, early in 1864 invaded Schleswig, drove the Danes back, and stormed their lines at Düppel; after which they quietly occupied all the disputed territory. When England, with Russia and Sweden, pressed for a conference to settle the dispute by international arbitration, France held back, and refused to oppose Prussia and Austria. The emperor suggested, as a middle course, that a plébiscite, his favorite idea when nationalities were in question, should be taken in the two duchies. The conference admitted this for Holstein, and refused it for Schleswig, and on this point the negotiations were broken off. The allied Germans speedily brought the war to an end by their overwhelming strength, and in October, 1864, it was agreed, after some difficulties, that Austria should take charge of Holstein, and Prussia of Schleswig. The confederation gained nothing; and it was obvious that Austria, too, could gain nothing by the occupation of so distant a province. France, which had so much to lose, according to the "doctrine of nationalities," had placed on record her firm belief in that idea, and had helped Prussia to become the champion of it for Germany; the foolish Mexican war, and the state of feeling at home, had in fact hampered France so much as to render her almost powerless at this moment.

The growth of Prussian power.

The jealousy between north and south Germany, which has existed ever since the time of the Reformation, now passed into a new phase. Prussia stood forward again as the champion of

1866-1867.

The treaty of Prague.

German unity, which had failed in 1848, though it had never ceased to be the desire of the nation; and the convention of Gastein, by which Austria retained Holstein, provided a starting-point for a new war in 1866, the "Seven Weeks' War." A visit of Count Bismarck to Napoleon in 1865 had shown that great statesman that he had nothing to fear from France; the second empire seemed paralyzed; Italy hastened to treat at Berlin for the completion of her unity, for north Germany and she had the same aims and the same enemies. They both wanted their national life to be completed; both were struggling, in large part, against the Catholic Church; both had Austria as their chief foe. Thus secured, Bismarck went boldly to war; and in an incredibly short time had crushed the resistance of Hanover, while he destroyed the Austrian power at Sadowa. The treaty of Prague, under the mediation of Napoleon III., soon followed. Though the Italians had been defeated at Custozza in the end of June, Sadowa had stricken such a blow at the heart of Austria that she abandoned all thought of further resistance, delivered Venetia over to Napoleon, who restored it at once to Italy, and signed the peace of Prague in August, 1866. By this document the old German Confederation was dissolved; Prussia took full possession of Holstein, and also of Schleswig, under the promise that if the northern or Danish-speaking part of that duchy desired to return to Denmark, it might say so. Up to the present time, Prussia, true to her ancient tradition of never letting go, has quietly retained the whole of the duchy. A new confederacy of the north of Germany was established under the headship of the king of Prussia, and that kingdom also received considerable additions. It was agreed that the river Main, which runs across that narrowest part of Germany, that hilly and wooded country which has seen so many struggles for mastery, and which for centuries has been, roughly speaking, the dividing-line between Low and High Germany, should now once more separate the northern from the southern confederacy. This arrangement, however, came to naught; Baden at once placed itself under the command of Prussia, and Würtemberg and Bavaria before long did the same. Austria was left alone, and almost excluded from Germany, while Prussia became at once the strongest power in Europe. France, which had welcomed with enthusiasm the restoration of Venetia to Italy, looked with less glad eyes at this growth of German strength across the Rhine. Thiers, with clear foresight, in 1866 predicted the coming empire of Germany; M. Magne, addressing Napoleon, did not hesitate to say that "the national feelings would be profoundly wounded if the final result should be that France has only gained by her intervention the establishment on her two flanks of two neighbors of abnormally increased strength. Greatness is after all a relative affair; and a country which in itself is no weaker than it was may be diminished by the accumulation of new forces around it."

French troops withdraw from Rome.

Discontent in France.

1868-1870.

M. Gambetta appears.

In 1866, after a convention with Italy, the French troops withdrew from Rome, while Victor Emmanuel promised not to molest the pope. There came, however, to Rome a French legion, composed of volunteers, chiefly old Bourbon partisans, commanded by a French general and officers of the French army. The presence of these troops was naturally regarded by Italy as a violation of the convention; so that when Garibaldi with his volunteers, in 1867, attempted to raise patriotic feelings in the territory round Rome, and in concert with the citizens to gain entrance into the Eternal City, the Italian Government took no steps to prevent him. The emperor, however, with unlucky zeal, after much hesitation, despatched General de Failly with a strong force to succor the pope, and thus placed himself openly in antagonism with Italy. The French and papal troops defeated the Garibaldians at Mentana (3d November, 1867); and Italy regarded herself as thenceforward free from all obligation of gratitude towards imperial France. On the other hand, the clerical party loudly complained that the emperor had but half done his work, and grumbled because he had not used his victory to restore to the papacy its lost territory. Thus Napoleon III. lost the favor of both sides, and left on men's minds the impression that he was a weak and irresolute ruler. Nor did his efforts to purchase the duchy of Luxembourg from Holland add to his reputation (1866-1867). For the intervention of Prussia defeated all his plans; and although the fortifications of Luxembourg were demolished, and the Prussian garrison withdrawn, it was felt that the emperor's attempt to strengthen his north-eastern frontier had completely failed, and that the antagonism between France and Prussia must one day lead to troubles. The boldness of the opposition increased; each slight advantage yielded by the Government in these days gave it fresh strength; Thiers was listened to with great interest when he demonstrated in 1868 the hollowness of imperial finance, the terrible burden of debt, the growing dimensions of the army expenditure, which was not accompanied by any real increase in the fighting-strength of the nation. The elections of 1869 showed the quick growth of the opposition; far from the old unanimity, the imperial Government did not obtain quite three-fifths of the votes; and again the large towns returned republican candidates. In this assembly M. Gambetta made his first public appearance among the "irreconcilables." In January, 1870, a quasi-liberal cabinet, headed by M. Ollivier, who had been won over by the emperor and empress in a private interview, endeavored to face the growing dissatisfaction; to reconcile the "irreconcilables," without endangering the imperial position. After many liberal professions, the emperor once more appealed to the country for a vote of confidence in himself, and in the hereditary character of his government. The reply of France seemed to be overwhelming and decisive,—7,358,786 Yes, against 1,571,939 No. This vote was taken on the 8th of May, 1870; within two months the Hohenzollern question had begun its ominous course.

The Hohenzollern question.

In 1868 the Spanish insurrection of September had dislodged Queen Isabella. She took refuge in France, with a crowd of partisans, and became at once the favored guest of the emperor and his Spanish spouse. In the provisional Government of Madrid General Prim in 1869 became president of the council of ministers, and began almost at once to search about Europe for an eligible king. In the course of his inquiries he happened on Prince Leopold of Hohenzollern-Sigmaringen, to whom he offered the crown of Spain without first announcing his intentions to the court of France. The intimacy existing between the empress and the ex-queen of Spain was no doubt a sufficient reason for this reticence. Prince Leopold at once informed the head of his house, the king of Prussia, of the fact, and the king authorized him to accept the offer. So stood affairs when the French cabinet thought it necessary to intervene. The two nations had regarded one another with distrust for years; in the beginning of the imperial rule the Prussians had stood aloof; the irritation which France felt at the Danish war passed into alarm after Sadowa. The failure of Benedetti's negotiation in 1870 with Bismarck as to Belgium added to the tension. The French Government was also uneasy at the evident signs of opposition at home, the decay of its popularity, the penalty of its corruption and extravagance; finally, there existed two courts, that of the empress and a more patriotic one, which dimly reflected the ancient antagonism between a Spanish party in high place and the true interests of the country. The emperor of the French, worn-out and more irresolute than ever, became the prey and victim of a faction. When Prince Leopold, on learning the objections of France, withdrew his candidature, the French Government, instead of accepting the act in a conciliatory spirit, seemed to be inspired by the temper of the duke of Grammont's speech in the Assembly at the time. "We cannot allow the actual balance of power in Europe to be deranged, and the interest and honor of France to be imperilled. We firmly hope this may not happen; against it we count on both the prudence of Germany and the friendship of Spain. Were it to be otherwise, strong in your support and in that of the nation, we should know how to do our duty, without hesitation and without weakness;"—brave words and menacing, but words which required real strength behind them, the very thing which was lacking. The empress and her friends wanted war; and consequently the king of Prussia was pressed, as a further step, to give assurances that he never would support Prince Leopold in any future candidature for the Spanish throne. This was equivalent to saying that war was determined on; and the Prussian cabinet made no further effort for peace. Steps were taken in Paris for a fresh *coup d'état* against the liberals, if they proved too obstructive; the empress was eager to secure, by a successful war, the throne for her son, and to appear as the champion of Catholic and Ultramontane principles in Europe. While the liberal party in the chamber and the country, headed by Thiers, persistently opposed the war, the Bonapartists fiercely pushed matters on; they refused the good offices of the other states of Europe; in shameful ignorance of the truth, they declared that everything was ready—"five times ready," "ready to the last gaiter-button"—and were only eager to begin. The ruffians of Paris, intoxicated after their sort by the brilliancy of an imperial policy, mobbed Thiers, attacked his house, and filled the streets with yells of *à Berlin*.

War with Germany.

The ignorance in France.

The battle of Sedan.

And thus war began, with the emperor as commander-in-chief and the empress as regent at Paris. France had no allies; her appeal to South Germany failed; Austria, however friendly, was paralyzed by Russia; for it was known that if Austria moved against Prussia, Russia would at once attack her; and the people of the lesser German states, whatever their Governments might think, were favorable to Prussia; for she seemed to them to be upholding a national cause. At Paris, the profoundest ignorance reigned. Nothing was known of the state of feeling in Germany, or of the real condition of the Prussian preparations for war. As little was known of the fitness of their own army for a great war; it was thought that it was strong and ready, whereas it was ill-organized, ill-supplied, and without proper reserves, while the incapacity of its leaders was appalling. No one knew anything of strategy; maps and plans were bad; even the employment of railways in war had never been properly studied; bravery there was in plenty, but leading and management were absolutely wanting. The French army was stretched across the frontier-line looking towards Germany from Strasburg to Metz; Metz became the French quarters-general, Mainz the German. By the 2d of August the hostile armies came into collision; the emperor's reconnaissance drove the Germans out of Sarrebruck on that day, and the prince imperial there underwent his "*Baptême de Feu*," a baptism into misfortune. This was the one and only success of the French arms across the German frontier; for on that same day General Douay was attacked and defeated at Wissembourg, and his position forced. Attacks followed sharply; on the 6th MacMahon was driven in at Wörth, and on the same day Frossard was defeated at the other end of the line. Before Paris had recovered from her delight at the trivial success of Sarrebruck, the ominous telegram, "Tout peut se retablir," awoke her to a true view of the state of things. It was soon seen that the emperor was unfit to command, and was a mere encumbrance; there was neither strategy in detail nor a definite plan of campaign; having let in the invasion, he resigned the post of commander-in-chief into the hands of Marshal Bazaine, and withdrew into Metz. The forward movement of the Germans soon alarmed both him and Paris, and then he decided (August 14) to retire to the camp at Chalons, where Marshal MacMahon was in command. The emperor's slow retreat, with a long train of useless followers, blocked the roads, and stopped the movement of troops and supplies. At this very time the Prussians and their allies were closing in on Metz; on the 14th at Borney, the 16th at Gravelotte, the 18th at Saint Privat, tremendous battles, in which the attacking Germans did not always get the best of it, hemmed the French in, and Bazaine withdrew with his large army into Metz. The French view of his conduct is that he meant to keep this army intact in order that afterwards, in conjunction with the Germans as his accomplices, he might secure, with a fresh military *coup d'état*, the imperial rule over France. Whatever he may have meant, the Germans had no intention of intrusting the fortunes of France to him. At this time General Trochu, an able soldier, whom the empress did not like, was appointed governor of Paris; the army of MacMahon was at Chalons intact, and a prudent ruler would have made these two strong forces act in concert. The empress, on the contrary, refused to hear of the emperor's return to Paris, and ordered MacMahon to march to the Belgian frontier, to take the Prussians on the flank, and to relieve Bazaine at Metz,—a plan excellent with a strong force able to march fast, fatal with an imperial army, disorganized, doubtful, and slow. The northward movement ended speedily in the great catastrophe of Sedan (1st September, 1870). On the 2d the emperor, with an army of more than 80,000 men, was the prisoner of war of the king of Prussia.

X. The Third Republic.

The third Republic.

The first siege of Paris.

In spite of all precautions the news oozed out at Paris all too soon for the dismayed imperialists. On September 4, 1870, the third Republic was proclaimed, with a Government of national defence, of which the chief members were Thiers, Jules Favre, Jules Simon, and Gambetta; General Trochu was its military head. Gradually the Germans closed in on Paris; no serious resistance in the field being attempted, or indeed being possible, at a moment when one half of the available army of France lay in Metz and the other half was either destroyed or prisoners at Sedan. The first siege of Paris lasted from September 19, 1870, to January 30, 1871, during which period also the temporal power of the papacy came to an end (September, 1870), for it fell with the imperial cause, which alone had held it up; and in December, 1870, at Versailles, the king of Prussia was proclaimed head of a new empire of Germany. With a German emperor, and Victor Emmanuel at Rome, and France in extremities, it was clear that great changes had come, and must lead eventually to broad rearrangements of the political world. While Paris held out bravely enough, if not very wisely, Gambetta at Tours used incredible efforts to raise fresh armies for France; the old hero of Italy, Garibaldi, also appeared, now that imperialism was gone, and placed his sword at the disposal of the struggling republic. Before the end of October the capitulation of Metz had released a whole German army, which protected the operations of the besieging hosts; at last, on January 28th, 1871, an armistice was announced, which brought the despairing resistance of Paris to an end. The war elsewhere died out almost at once; the Germans occupied all the forts round Paris.

The Assembly of Bordeaux.

The second siege of Paris.

On 8th February elections took place for a National Assembly to be held at Bordeaux, to deliberate on the question of peace or war, or rather, to arrange the terms of peace,—for the country returned the Assembly with that intention. It was a body nominally republican, with strong monarchical leanings, as yet unexpressed; hardly half a dozen Bonapartists were returned to it. Garibaldi was among the deputies elected, though he declined the honor of acting as a Frenchman. The new republican Government of France now had M. Grévy as president, and Thiers as chief of the executive power; and it was decided that the Assembly should sit at Versailles. The fierce outbreak of the hot republicans of Paris interfered sorely with their peaceful labors. On 18th March the commune of Paris declared itself in opposition to the Versailles republic; the old grudges of artisan Paris once more asserted their unpleasant existence; and Marshal MacMahon was instructed by the Versailles Assembly to reduce the insurgent capital. Then followed the second siege of Paris, from April 2 to May 21, with its accompanying horrors, and the gloomy spectacle of street-fighting and the burning and ruin of the public buildings of the town.

The treaty of Frankfort.

Meanwhile M. Thiers, with infinite toil, and with journeys from court to court of Europe, had at last, by his unwearying activity, succeeded in getting terms of peace agreed to. The treaty of Frankfort was signed on the 10th of May, 1871; by it Alsace and a large part of Lorraine were ceded back to Germany, while Belfort was restored to France; a huge money indemnity was to be paid to Germany for the costs of the war.

The reactionary Versailles Assembly.

The parties in it.

The reactionary measures of the Versailles Assembly soon began,—timidly at first, to push forward with boldness, if the first steps succeeded. Thus, it suppressed the national guard, in spite of the moderate opposition of M. Thiers; it allowed Orleanist princes and members of the Bonapartist family to enter the Assembly; it strengthened its position at Versailles, though it had not the courage to move the Government offices thither. Early in 1872 the opposition of the Assembly to his financial proposals led to a first resignation of M. Thiers; only on its earnest and almost unanimous petition did he consent to hold office any longer. Meanwhile, the attempts at a fusion between the legitimists and Orleanists failed completely; the efforts of the Bonapartists, led by M.

Rouher, were redoubled; a great organized propaganda was set afoot; newspapers, pamphlets, photographs, bribes for the army and for Government officials, intrigues of every kind, were in motion, in order to create a public opinion on behalf of the emperor and the young prince imperial, as he was still persistently called. The three parties agreed in one thing, at least,—that they would before long put an end to the republic. At the end of 1872 a commission of thirty was appointed to regulate the arrangement of public powers and duties, and to settle the vexed question of ministerial responsibility. It was composed of a majority of the Right, the members of the different anti-republican parties in the Assembly. From it sprang the attempts of the Assembly to postpone the day of its dissolution, and to frame the government of France in such a way as to secure the defeat of the republic. The weakness of the majority lay in the fact that their union was only negative; and that if they did agree, it was only till they could rid themselves of the republic.

Death of Napoleon III.

The death of Napoleon III. at Chiselhurst in January, 1873, created little or no feeling in France, and showed that imperialism had small hold on the popular mind. The Assembly now decided that it would remove the president from the chamber, because of the great influence which Thiers could always exert on a debate; and, secondly, that it would push back its own dissolution as far as possible. These proposals Thiers accepted, rather than run the risk of a collision. When, however, it was announced that, thanks chiefly to the president's exertion, the evacuation of France by the Prussian troops would take place two years sooner than had been originally stipulated, and that the last foreign soldier would march off in September, 1873, the parties of the majority became seriously alarmed; for the life of the Assembly had been, by their own admission, connected with the period of continuance of German troops in France. Early in April, 1873, on the resignation of M. Grévy, president of the chamber, they carried their candidate M. Buffet, against the Thiers Government; in May they came to close quarters, and brandishing their favorite weapon, the "red spectre," these three reactionary parties defeated Thiers by a majority of 16 (360 against 344). Then the old minister resigned, and the parties, which had arranged their plans beforehand, at once elected as president Marshal MacMahon, the "honnête homme et soldat," as he styled himself. With him they associated a cabinet of which the head was M. de Broglie. Immediately the functionaries were changed throughout France, and everywhere old imperialists were put in. At the beginning of 1875 it was agreed that the presidency should be for seven years, and a new constitution, with the republican element as much as possible effaced, was set up in February, 1875. Before this M. de Broglie had fallen under the ill-will of the monarchical parties, and had been compelled by an adverse vote of the chamber to send in his resignation. He was succeeded by General de Cissey, with what was called, by an inopportune invention, "a business cabinet." The new constitution provided a president with a cabinet, a body which, by being thus styled "a business cabinet," seemed to make the president's personality all the stronger; then there was a senate of 300 members, of whom 75 were life-holders, and the rest elected for nine years, renewable by triennial elections of a third at a time; and, lastly, a chamber of deputies, to be elected by the country in the usual way.

Fall of M. Thiers.

A reactionary constitution.

The dissolution of the Assembly.

The time came at last when the chamber, which had been elected to decide on peace or war, and had taken to itself the functions of a constituent assembly, and had framed a new constitution, and had defied the public opinion of France expressed at almost every bye-election, must bring its half-usurped functions to an end. The successive triumphs of the republicans in bye-elections had strengthened them so much that they could now hold their own in the chamber. The president, aware that his strength was going, got rid of the cabinet of Dufaure and Jules Simon, and, trusting to official pressure at a new election, hoping also to work on the old fears respecting the extremer party, the "irreconcilables," took advantage of an adverse vote, and after having in May, 1877, adjourned the chamber for a month, eventually dissolved it on June 25, 1877. The republican party showed extraordinary prudence and moderation under excessive provocation; the influence of the great jurists, Dufaure and Grévy, made itself felt, neutralizing all the plots of the reaction, and quietly prolonging the crisis, until the country could speak; the "Opportunists," as the followers of Thiers and Gambetta were now styled, united with the "irreconcilables" in opposition to the "party of order," as the intriguers of the three reactionary groups, legitimists, Orleanists, imperialists, loved to call themselves. In spite of shameless interferences with the election, in spite of the unseemly appeal of the president himself, in spite of threats and all the ancient weapons of reaction, the country was so decidedly republican that even the death of Thiers (3d September, 1877) could not for a moment check the fortunes of his party. His death perhaps even strengthened it, for he became the saint instead of being the leader of it. His chequered political career, so long past, was quite forgotten; his memory was revered as that of the statesman who in his old age saved Belfort to France, brought peace, secured the payment of the war indemnity, and relieved the country from the German occupation. All France felt that under his guidance tranquillity had returned, and the timid middle classes had learned to couple prosperity with the republic. And so the elections of 1877 returned a decisive majority for the republicans, now headed by MM. Grévy and Gambetta; the "irreconcilables" were not strong in the new chamber; the reactionary parties lost ground; and M. Grévy was at once re-elected president of the chamber. Consequently, the marshal president, after France had been deeply agitated by rumors of a new *coup d'état*, and by ominous movements of troops, at last gave way, and, honestly if reluctantly, accepted the verdict of the country. The reactionary "Ministry of May 16" fell, and, after a new attempt at a "business ministry," a republican cabinet was formed at last (14th December, 1877), under the presidency of M. Dufaure. By degrees, as the shameless behavior of officials at election after election came to light, the bureaucracy of France began to resume a republican color, by removals of reactionary prefects, by opportune changes of political views, and acquiescence in the loudly pronounced opinion of the nation. The army, which was far from satisfied with the late Government, showed signs of content under the new. In the senate only did the three reactionary parties still possess any power; and even there their majority was so small that they could not venture on serious resistance. The Orleanist section, which, though very weak in numbers, still held the balance, and could give the majority to either side, was timid and moderate, and averse to heroic measures. Their refusal to prolong the crisis by consenting to a second dissolution of the chamber of deputies gave time for the moderate republic to consolidate its powers. The elections of 5th January, 1879, in which, according to the present constitution of France, one-third of the senate has undergone re-election, have happily brought that body into harmony with the chamber of deputies and the country. Fresh rumors of trouble had been industriously circulated; the temper of France is, however, so thoroughly tranquil, and so decided in favor of a constitutional republic, that the hopes of the reactionary parties have all been frustrated.

Death of Thiers.

The Assembly of 1877.

Conclusion.

It is always absurd to indulge in historical prophecy; and forecasts as to the future of France, thanks to the quick movement of opinion, the general ignorance of the country people, the vehemence in the towns, the long succession of changes in government and constitution, must be specially precarious. Still, it is clear that, for a time at least, the reaction, however strong elsewhere, has been defeated in France; above all it is clear that imperialism has received a heavy if not a fatal blow. This is no little matter. We live in days in which the growth of a modern imperialism, based on huge armaments and destructive of small states, had become a standing menace to the well-being of the world; it is a ground for hope and thankfulness that France, the central state of Europe, has definitely and calmly abandoned her imperialist traditions, and set herself to live the temperate life of a constitutional republic.

Each race has its own special function in the general polity of nations; France seems called to lead in the propagation of wholesome political ideas. Even in her most violent moods, her principles have been right, her theories humane and noble. It is true that she is deficient in many practical gifts; religion with her has ever held a very secondary place; her ideas on economical questions are narrow, and in many points her sympathies are not enlisted on behalf of what seems to us to be best. Still, her present position is an incalculable gain to Europe, and a promise of good for the future. With France as a prudent republic, the resistance of the peoples of Europe to arbitrary power and crushing armies will gradually be strengthened; and constitutional life, already developing itself throughout the Latin races, will find its best guarantee of stability. The movements of Europe have often taken their rise from France; the union of a strong government with a vigorous national life may also come to date from her; if England has striven to impress the practical rendering of her constitutional principles and her tongue on half the world, France can also boast that she has provided her part by enunciating, with the most admirable clearness of speech and thought, those general ideas as to the relations between man and man which lie at the basis of any wholesome system of government. (G. W. K.)

PART III.—FRENCH LANGUAGE.

I. *Geography.*—French is the general name of the north-north-western group of Romanic dialects, the modern Latin of northern Gaul (carried by emigration to some places—as Lower Canada—out of France). In a restricted sense it is that variety of the Parisian dialect which is spoken by the educated, and is the general literary language of France. The region in which the native language is termed French consists of the northern half of France (including Lorraine) and parts of Belgium and Switzerland; its boundaries on the west are the Atlantic Ocean and the Celtic dialects of Brittany; on the north-west and north, the English Channel; on the north-east and east the Teutonic dialects of Belgium, Germany, and Switzerland. In the south-east and south the boundary is to a great extent conventional and ill-defined, there being originally no linguistic break between the southern French dialects and the northern Provençal dialects of southern France, north-western Italy, and south-western Switzerland. It is formed partly by spaces of intermediate dialects (some of whose features are French, others Provençal), partly by spaces of mixed dialects resulting from the invasion of the space by more northern and more southern settlers, partly by lines where the intermediate dialects have been suppressed by more northern (French) and more southern (Provençal) dialects without these having mixed. Starting in the west at the mouth of the Gironde, the boundary runs nearly north soon after passing Bordeaux; a little north of Angoulême it turns to the east, and runs in this direction into Switzerland to the north of Geneva.

II. *External History.*—(*a*) *Political.*—By the Roman conquests the language of Rome was spread over the greater part of southern and western Europe, and gradually supplanted the native tongues. The language introduced was at first nearly uniform over the whole empire, Latin provincialisms and many more or less general features of the older vulgar language being suppressed by the preponderating influence of the educated speech of the capital. As legions became stationary, as colonies were formed, and as the natives adopted the language of their conquerors, this language split up into local dialects, the distinguishing features of which are due, as far as can be ascertained (except, to some extent, as to the vocabulary), not to speakers of different nationalities misspeaking Latin, each with the peculiarities of his native language, but to the fact that linguistic changes, which are ever occurring, are not perfectly uniform over a large area, however homogeneous the speakers. As Gaul was not conquered by Cæsar till the middle of the first century before our era, its Latin cannot have begun to differ from that of Rome till after that date; but the artificial retention of classical Latin as the literary and official language after the popular spoken language had diverged from it, often renders the chronology of the earlier periods of the Romanic languages obscure. It is, however, certain that the popular Latin of Gaul had become differentiated from that of central Italy before the Teutonic conquest of Gaul, which was not completed till the latter half of the 5th century; the invaders gradually adopted the language of their more civilized subjects, which remained unaffected, except in its vocabulary. Probably by this time it had diverged so widely from the artificially preserved literary language that it could no longer be regarded merely as mispronounced Latin; the Latin documents of the next following centuries contain many clearly popular words and forms, and the literary and popular languages are distinguished as *latina* and *romana*. The term *gallica*, at first denoting the native Celtic language of Gaul, is found applied to its supplanter before the end of the 9th century, and survives in the Breton *gallek*, the regular term for "French." After the Franks in Gaul had abandoned their native Teutonic language, the term *francisca*, by which this was denoted, came to be applied to the Romanic one they adopted, and, under the form *française*, remains its native name to this day; but this name was confined to the Romanic of northern Gaul, which makes it probable that this, at the time of the adoption of the name *francisca*, had become distinct from the Romanic of southern Gaul. *Francisca* is the Teutonic adjective *frankisk*, which occurs in Old English in the form *frencisc*; this word, with its umlauted *e* from *a* with following *i*, survives under the form *French*, which, though purely Teutonic in origin and form, has long been exclusively applied to the Romanic language and inhabitants of Gaul. The German name *franzose*, with its accent on, and *o* in, the second syllable, comes from *françois*, a native French form older than *français*, but later than the Early Old French *franceis*. The Scandinavian settlers on the north-west coast of France early in the 10th century quickly lost their native speech, which left no trace except in some contributions to the vocabulary of the language they adopted. The main feature since is the growth of the political supremacy of Paris, carrying with it that of its dialect; in 1539 Francis I. ordered that all public documents should be in French (of Paris), which then became the official language of the whole kingdom, though it is still foreign to nearly half its population.

The conquest of England in 1066 by William, duke of Normandy, introduced into England, as the language of the rulers and (for a time) most of the writers, the dialects spoken in Normandy. Confined in their native country to definite areas, these dialects, following their speakers, became mixed in England, so that their forms were used to some extent indifferently; and the constant communication with Normandy maintained during several reigns introduced also later forms of Continental Norman. As the conquerors learned the language of the conquered, and as the more cultured of the latter learned that of the former, the Norman of England (including that of the English-speaking Lowlands of Scotland) became anglicized; instead of following the changes of the Norman of France, it followed those of English. The accession in 1154 of Henry II. of Anjou disturbed the Norman character of Anglo-French, and the loss of Normandy under John in 1204 gave full play to the literary importance of the French of Paris, many of whose forms afterwards penetrated to England. At the same time English, with a large French addition to its vocabulary, was steadily recovering its supremacy, and is officially employed (for the first time since the Conquest) in the Proclamation of Henry III., 1258. The semi-artificial result of this mixture of French of different dialects and of different periods, more or less anglicized according to the date or education of the speaker or writer, is generally termed "the Anglo-Norman dialect;" very misleadingly for a great part of its existence, because, while the French of Normandy was not a single dialect, the later French of England came from other French provinces besides Normandy, and being to a considerable extent in artificial conditions, was checked in the natural development implied by the term "dialect." The disuse of Anglo-French as a natural language is evidenced by English being substituted for it in legal proceedings in 1362, and in schools in 1387; but law reports were written in it up to 1600, and converted into modern literary French, it remains in official use for giving the royal assent to bills of parliament.

(*b*) *Literary.*—Doubtless because the popular Latin of northern Gaul changed more rapidly than that of any other part of the empire, French was, of all the Romanic dialects, the first to be recognized as a distinct language, and the first to be used in literature; and though the oldest specimen now extant is probably not the first, it is considerably earlier than any existing documents of the allied languages. In 813 the council of Tours ordered certain homilies to be translated into Rustic Roman or into German; and in 842 Louis the German, Charles the Bald, and their armies confirmed their engagements by taking oaths in both languages at Strasburg. These have been preserved to us by the historian Nithard (who died in 853); and though, in consequence of the only existing manuscript (at Rome) being more than a century later than the time of the author, certain alterations have occurred in the text of the French oaths, they present more archaic forms (probably of North-Eastern French) than any other document. The next memorials are a short poem, probably North-Eastern, on St. Eulalia, preserved in a manuscript of the 10th century at Valenciennes, and some autograph fragments (also at Valenciennes) of a homily on the prophet Jonah, in mixed Latin and Eastern French, of the same period. To the same century belong a poem on Christ's Passion, apparently in a mixed (not intermediate) language of French and Provençal, and one, probably in South-Eastern French, on St. Leger; both are preserved, in different handwritings, in a MS. at Clermont-Ferrand, whose scribes have introduced many Provençal forms. After the middle of the 11th century literary remains are comparatively numerous; the chief early representatives of the main dialects are the following, some of them preserved in several MSS., the earliest of which, however (the only ones here mentioned), are in several cases a generation or two later than the works themselves. In Western French are a verse life of St. Alexius (Alexis), probably Norman, in an Anglo-Norman MS. at Hildesheim; the epic poem of Roland, possibly also Norman, in an A.-N. MS. at Oxford; a Norman verbal translation of the Psalms, in an A.-N. MS. also at Oxford; another later one in an A.-N. MS. at Cambridge; a Norman translation of the Four Books of Kings, in a native MS. at Paris. The earliest work in the Parisian dialect is probably the Travels of Charlemagne, preserved in a late Anglo-Norman MS. with much-altered forms. In Eastern French, of rather later date, there are translations of the Dialogues of Pope Gregory, in a MS. at Paris, containing also fragments of Gregory's Moralities, and (still later) of some Sermons of St. Bernard, in a MS. also at Paris. From the end of the 12th century literary and official documents, often including local charters, abound in almost every dialect, until the growing influence of Paris caused its language to supersede in writing the other local ones. This influence, occasionally apparent in the 12th century, was overpowering in the 15th, when authors, though often displaying provincialisms, almost all wrote in the dialect of the capital; the last dialect to lose its literary independence was the North-Eastern, which, being the Romanic language of Flanders, had a political life of its own, and (modified by Parisian) was used in literature after 1400.

III. *Internal History.*—So little has been done until recently, and so much remains to be done, in the scientific investigation of the sounds, inflexions, and syntax of the older stages and dialects of French, that what follows cannot claim to be more than a fragmentary sketch, mainly of the dialects—that which is now literary modern French, and those which were imported into England by the Normans—in which English readers will probably take most interest, and especially of the features which explain the forms of English words of French origin. Dates and places are only approximations, and many statements are liable to be modified by further researches; want of space obliges many exceptions and limitations to the general laws, and many points of hardly inferior importance to those here noticed, to be passed over in silence. The primitive Latin forms given are often not classical Latin words, but derivatives from these; and reference is generally made to the Middle English (Chaucerian) pronunciation of English words, not the modern.

(*a*) *Vocabulary.*—The fundamental part of the vocabulary of French is the Latin imported into Gaul, the French words being simply the Latin words themselves, with the natural changes undergone by all living speech, or derivatives formed at various dates. Comparatively few words were introduced from the Celtic language of the native inhabitants (*bec lieue* from the Celtic words given by Latin writers as *beccus, leuca*), but the number adopted from the language of the Teutonic conquerors of Gaul is large (*guerre* = *werra; laid* = *laidh; choisir* = *kausjan*). The words were imported at different periods of the Teutonic supremacy, and consequently show chronological differences in their sounds (*haïr* = *hatan; français* = *frankisk; écrevisse* = *krebiz; échine* = *skina*). Small separate importations of Teutonic words resulted from the Scandinavian settlement in France, and the commercial intercourse with the Low German nations on the North Sea (*friper* = Norse *hripa; chaloupe* = Dutch *sloop; est* = Old English *eást*). In the mean time, as Latin (with considerable alterations in pronunciation, vocabulary, etc.) continued in literary, official, and ecclesiastical use, the popular language borrowed from time to time various more or less altered classical Latin words; and when the popular language came to be used in literature, especially in that of the church, these importations largely increased (*virginitet* Eulalia = *virginitātem; imagena* Alexis = *imāginem*—the popular forms would probably have been *vernedet, emain*). At the Renaissance they became very abundant, and have continued since, stifling to some extent the developmental power of the language. Imported words, whether Teutonic, classical Latin, or other, often receive some modification at their importation, and always take part in all subsequent natural phonetic changes in the language (Early old French *adversarie*, modern French *adversaire*). Those French words which appear to contradict the phonetic laws were mostly introduced into the language after the taking place (in words already existing in the language) of the changes formulated by the laws in question; compare the late imported *laïque* with the inherited *lai*, both from Latin *laicum*. In this and many other cases the language possesses two forms of the same Latin words, one descended from it, the other borrowed (*meuble* and *mobile* from *mōbilem*). Some Oriental and other foreign words were brought in by the crusaders (*amiral* from *amir*); in the 16th century, wars, royal marriages, and literature caused a large number of Italian words (*soldat* = *soldato; brave* = *bravo; caresser* = *carezzare*) to be introduced, and many Spanish ones (*alcôve* = *alcoba; hâbler* = *hablar*). A few words have been furnished by Provençal (*abeille, cadenas*), and several have been adopted from other dialects into the French of Paris (*esquiver* Norman or Picard for the Paris French *eschiver*). German has contributed a few (*blocus* = *blochūs; choucroute* = *sūrkrūt*); and recently a considerable number have been imported from England (*drain, comfortable, flirter*). In Old French, new words are freely formed by derivation, and to a less extent by composition; in Modern French, borrowing from Latin or other foreign languages is the more usual course. Of the French words now obsolete some have disappeared because the things they express are obsolete; others have been replaced by words of native formation, and many have been superseded by foreign words generally of literary origin; of those which survive, many have undergone considerable alterations in meaning. A large number of Old French words and meanings, now extinct in the language of Paris, were introduced into English after the Norman Conquest; and though some have perished, many have survived—*strife* from Old French *estrif* (Teutonic *strīt*); *quaint* from *cointe* (*cognitum*); *remember* from *remembrer* (*rememorāre*); *chaplet* (garland) from *chapelet* (Modern French "chaplet of beads"); *appointment* (rendezvous) from *appointement* (now "salary"). Many also survive in other French dialects.

(*b*) *Dialects.*—The history of the French language from the period of its earliest extant literary memorials is that of the dialects composing it. But as the popular notion of a dialect as the speech of a definite era, possessing certain peculiarities confined to and extending throughout that era, is far from correct, it will be advisable to drop the misleading divisions into "Norman dialect," "Picard dialect," and the like, and take instead each important feature in the chronological order (as far as can be ascertained) of its development, pointing out roughly the area in which it exists, and its present state. The local terms used are intentionally vague, and it does not, for instance, at all follow that because "Eastern" and "Western" are used to denote the localities of more than one dialectal feature, the boundary line between the two divisions is the same in each case. It is, indeed, because dialectal differences as they arise do not follow the same boundary lines (much less the political divisions of provinces), but cross one another to any extent, that to speak of the dialect of a large area as an individual whole, unless that area is cut off by physical or alien linguistic boundaries, creates only confusion. Thus the Central French of Paris the ancestor of classical Modern French, belongs to the South in having *ts*, not *tsh*, for Latin *k* (*c*) before *i* and *e; tsh*, not *k*, for *k* (*c*) before *a;* and *gu*, not *w*, for Teutonic *w;* while it belongs to the East in having *oi* for earlier *ei;* and to the West in having *é*, not *ei*, for Latin *a;* and *i*, not *ei*, from Latin ĕ + *i*. It may be well to note that Southern *French* does not correspond to southern *France*, whose native language is Provençal. "Modern French" means ordinary educated Parisian French.

(c) *Phonology*.—The history of the sounds of a language is, to a considerable extent, that of its inflexions, which, no less than the body of a word, are composed of sounds. This fact, and the fact that unconscious changes are much more reducible to law than conscious ones, render the phonology of a language by far the surest and widest foundation for its dialectology, the importance of the sound-changes in this respect depending, not on their prominence, but on the earliness of their date. For several centuries after the divergence between spoken and written Latin, the history of these changes has to be determined mainly by reasoning, aided by a little direct evidence in the misspellings of inscriptions, the semi-popular forms in glossaries, and the warnings of Latin grammarians against vulgarities. With the rise of Romanic literature the materials for tracing the changes become abundant, though as they do not give us the sounds themselves, but only their written representations, much difficulty, and some uncertainty, often attach to deciphering the evidence. Fortunately, early Romanic orthography, that of Old French included (for which see next section), was phonetic, as Italian orthography still is; the alphabet was imperfect, as many new sounds had to be represented which were not provided for in the Roman alphabet from which it arose, but writers aimed at representing the sounds they uttered, not at using a fixed combination of letters for each word, however they pronounced it,

The characteristics of French as distinguished from the allied languages and from Latin, and the relations of its sounds, inflexions, and syntax to those of the last-named language, belong to the general subject of the Romanic languages. It will be well, however, to mention here some of the features in which it agrees with the closely related Provençal, and some in which it differs. As to the latter, it has already been pointed out that the two languages glide insensibly into one another, there being a belt of dialects which possess some of the features of each. French and Provençal of the 10th century—the earliest date at which documents exist in both—agree to a great extent in the treatment of Latin final consonants and the vowels preceding them, a matter of great importance for inflexions (numerous French examples occur in this section.) (1) They reject all vowels, except *a*, of Latin final (unaccented) syllables, unless preceded by certain consonant combinations or followed by *nt* (here, as elsewhere, certain exceptions cannot be noticed); (2) they do not reject *a* similarly situated; (3) they reject final (unaccented) *m*; (4) they retain final *s*. French and Northern Provençal also agree in changing Latin *ū* from a labio-guttural to a labio-palatal vowel; the modern sound (German *ü*) of the accented vowel of French *lune*, Provençal *luna*, contrasting with that in Italian and Spanish *luna*, appears to have existed before the earliest extant documents. The final vowel laws generally apply to the unaccented vowel preceding the accented syllable, if it is preceded by another syllable, and followed by a single consonant—*matin* (*mātūtīnum*), *dortoir* (*dormītōrium*), with vowel dropped; *canevas* (*cannabāceum*), *armedure* later *armëure*, now *armure* (*armātūram*), with *e*=ə, as explained below.

On the other hand, French differs from Provençal:—(1) in uniformly preserving (in Early Old French) Latin final *t*, which is generally rejected in Provençal—French *aimet* (Latin *amat*), Provençal *ama; aiment* (*amant*), *aman;* (2) in always rejecting, absorbing, or consonantizing the vowel of the last syllable but one, if unaccented; in such words as *angele* (often spelt *angle*), the *e* after the *g* only serves to show its soft sound—French *veintre* (*vaincre*, Latin *viñcere*), Provençal *vencer*, with accent on first syllable; French *esclandre* (*scandalum*), Provençal *escandol;* French *olie* (dissyllabic, *i*=*y* consonant, now *huile*), Provençal *oli* (*oleum*); (3) in changing accented *a* not in position into *ai* before nasals and gutturals and not after a palatal, and elsewhere into *é* (West French) or *ei* (East French), which develops an *i* before it when preceded by a palatal—French *main* (Latin *manum*), Provençal *man; aigre* (*ācrem*), *agre; ele* (*ālam*), East French *eile, ala; meitié* (*medietātem*), East French *moitieit, meitat;* (4) in changing *a* in unaccented final syllables into the vowel ə, intermediate to *a* and *e;* this vowel is written *a* in one or two of the older documents, elsewhere *e*—French *aime* (Latin *amā*), Provençal *ama; aimes* (*amās*), *amas; aimet* (*amat*), *ama;* (5) in changing original *au* into ò—French *or* (*aurum*), Provençal *aur; rober* (Teutonic *raubōn*), *raubar;* (6) in changing general Romanic *é*, from accented *ē* and *ĭ* not in position, into *ei*—French *veine* (*vēnam*), Provençal *vena; peil* (*pilum*), *pel*.

As some of the dialectal differences were in existence at the date of the earliest extant documents, and as the existing materials, till the latter half of the 11th century, are scanty and of uncertain locality, the chronological order (here adopted) of the earlier sound-changes is only tentative.

(1.) Northern French has *tsh* (written *c* or *ch*) for Latin *k* (*c*) and *t* before palatal vowels, where Central and Southern French have *ts* (written *c* or *z*)—North Norman and Picard *chire* (*cēram*), *brach* (*brāchium*), *plache* (*plateam*); Parisian, South Norman, etc., *cire, braz, place*. Before the close of the Early Old French period (12th century) *ts* loses its initial consonant, and the same happened to *tsh* a century or two later; with this change the old distinction is maintained—Modern Guernsey and Picard *chire*, Modern Picard *plache* (in ordinary Modern French spelling); usual French *cire, place*. English, having borrowed from North and South Norman (and later Parisian), has instances of both *tsh* and *s*, the former in comparatively small number—*chisel* (Modern French *ciseau*=(?) *caesellum*), *escutcheon* (*écusson, scūtiōnem*); *city* (*cité, cīvitātem*), *place*. (2.) Initial Teutonic *w* is retained in the north-east and along the north coast; elsewhere, as in the other Romance languages, *g* was prefixed—Picard, etc., *warde* (Teutonic *warda*), *werre* (*werra*); Parisian, etc., *guarde, guerre*. In the 12th century the *u* or *w* of *gu* dropped, giving the Modern French *garde, guerre* (with *gu*=*g*); *w* remains in Picard and Walloon, but in North Normandy it becomes *v*—Modern Guernsey *vâson*, Walloon *wazon*, Modern French *gazon* (Teutonic *wason*). English has both forms, sometimes in words originally the same—*wage* and *gage* (Modern French *gage*, Teutonic *wadi*); *warden* and *guardian* (*gardien, warding*). (3.) Latin *b* after accented *a* in the imperfect of the first conjugation, which becomes *v* in Eastern French, in Western French further changes to *w*, and forms the diphthong òu with the preceding vowel—Norman *amowe* (*amābam*), *portout* (*portābat*); Burgundian *ameve, portevet*. *Eve* is still retained in some places, but generally the imperfect of the first conjugation is assimilated to that of the others—*amoit*, like *avoit* (*habēbat*). (4.) The palatalization of every then existing *k* and *g* (hard) when followed by *a, i*, or *e*, after having caused the development of *i* before the *e* (East French *ei*) derived from *a* not in position, is abandoned in the north, the consonants returning to ordinary *k* or *g*, while in the centre and south they are assibilated to *tsh* or *dzh*—North Norman and Picard *cachier* (*captiāre*), *kier* (*cārum*), *cose* (*causam*), *eskiver* (Teutonic *skiuhan*), *wiket* (Teutonic *wik*+*ittum*), *gal* (*gallum*), *gardin* (from Teutonic *gard*); South Norman and Parisian *chacier, chier, chose, eschiver, guichet, jal, jardin*. Probably in the 14th century the initial consonant of *tsh, dzh* disappeared, giving the modern French *chasser, jardin* with *ch*=*sh* and *j*=*zh*; but *tsh* is retained in Walloon, and *dzh* in Lorraine. The Northern forms survive—Modern Guernsey *cachier, gardin;* Picard *cacher, gardin*. English possesses numerous examples of both forms, sometimes in related words—*catch* and *chase; wicket, eschew; garden, jaundice* (*jaunisse*, from *galbanum*). (5.) For Latin accented *a* not in position Western French usually has *é*, Eastern French *ei*, both of which take an *i* before them when a palatal precedes—Norman and Parisian *per* (*parem*), *oiez* (*audiātis*); Lorraine *pier, oieis*. In the 17th and 18th centuries close *é* changed to open *è*, except when final or before a silent consonant—*amer* (*amārum*) now having *è*, *aimer* (*amāre*) retaining *é*. English shows the Western close *é*—*peer* (Modern French *pair*, Old French *per*), *chief* (*chef, caput*); Middle High German the Eastern *ei*—*lameir* (Modern French *l'amer, l'aimer, la mer*=Latin *mare*). (6.) Latin accented *e* not in position, when it came to be followed in Old French by *i*, unites with this to form *i* in the Western dialects, while the Eastern have the diphthong *ei*—Picard, Norman, and Parisian *pire* (*pejor*), *piz* (*pectus*); Burgundian *peire, peiz*. The distinction is still preserved—Modern French *pire, pis;* Modern Burgundian *peire, pei*. English words show always *i*—*price* (*prix, pretium*), *spite* (*dépit, dēspectum*). (7.) The nasalization of vowels followed by a nasal consonant did not take place simultaneously with all the vowels. *A* and *e* before ṅ (guttural *n*, as in *sing*), ñ (palatal *n*), *n*, and *m* were nasal in the 11th century, such words as *tant* (*tantum*) and *gent* (*gentem*) forming in the Alexis assonances to themselves, distinct from the assonances with *a* and *e* before non-nasal consonants. In the Roland *umbre* (*ombre, umbram*) and *culchet* (*couche, collocat*), *fier* (*ferum*) and *chiens* (*canēs*), *dit* (*dictum*) and *vint* (*vēnit*), *ceinte* (*ciñctam*) and *veie* (*voie, viam*), *brun* (Teutonic *brūn*) and *fut* (*fuit*) assonate freely, though *o* (*u*) before nasals shows a tendency to separation. The nasalization of *i* and *u* (=Modern French *u*) did not take place till the 16th century; and in all cases the loss of the following nasal consonant is quite modern, the older pronunciation of *tant, ombre* being *tãnt, ombrə*, not as now *tã, õbrh*. The nasalization took place whether the nasal consonant was or was not followed by a vowel, *femme* (*fēminam*), *honneur* (*honōrem*) being pronounced with nasal vowels in the first syllable till after the 16th century, as indicated by the doubling of the nasal consonant in the spelling, and by the phonetic change (in *femme* and other words) next to be mentioned. English generally has *au* (now often reduced to *a*) for Old French *ã*—*vaunt* (*vanter, vānitāre*), *tawny* (*tanné*, (?) Celtic). (8.) The assimilation of *ẽ* (nasal *e*) to *ã* (nasal *a*) did not begin till the middle of the 11th century, and is not yet universal in France, though generally a century later. In the Alexis nasal *a* (as in *tant*) is never confounded with nasal *e* (as in *gent*) in the assonances, though the copyist (a century later) often writes *a* for nasal *e* in unaccented syllables, as in *amfant* (*enfant, infantem*); in the Roland there are several cases of mixture in the assonances, *gent*, for instance, occurring in *ant* stanzas, *tant* in *ent* ones. English has several words with *a* for *e* before nasals—*rank* (*rang*, Old French *renc*, Teutonic *hringa*), *pansy* (*pensée, pēnsātam*); but the majority show *e*—*enter* (*entrer, intrāre*), *fleam* (*flamme*, Old French *fleme, phlebotomum*). The distinction is still preserved in the Norman of Guernsey, where *an* and *en*, though both nasal, have different sounds—*lànchier* (*lancer, lañceāre*), but *mèntrie* (Old French *menterie*, from *mentīrī*). (9.) The loss of *s*, or rather *z*, before voiced consonants began early, *s* being often omitted or wrongly inserted in 12th century MSS.—Earliest Old French *masle* (*masculum*), *sisdre* (*sīceram*); Modern French *mâle, cidre*. In English it has everywhere disappeared—*male, cider;* except in two words, where it appears, as occasionally in Old French, as *d*—*meddle* (*mêler, misculāre*), *medlar* (*néflier*, Old French also *meslier, mespilārium*). The loss of *s* before voiceless consonants (except *f*) is about two centuries later, and it is not universal even in Parisian—Early Old French *feste* (*festam*), *escuier* (*scūtārium*); Modern French *fête, écuyer*, but *espérer* (*spērāre*). In the north-east *s* before *t* is still retained—Walloon *chestai* (*château, castellum*), *fiess* (*fête*). English shows *s* regularly—*feast, esquire*. (10.) Medial *dh* (soft *th*, as in *then*), and final *th* from Latin *t* or *d* between vowels, do not begin to disappear till the latter half of the 11th century. In native French MSS. *dh* is generally written *d*, and *th* written *t*; but the German scribe of the Oaths writes *adjudha* (*adjūtam*), *cadhuna* (Greek *katá* and *ūnam*); and the English one of the Alexis *cuntretha* (*contrātam*), *lothet* (*laudātum*), and that of the Cambridge Psalter *heriteth* (*hērēditātem*). Medial *dh* often drops even in the last-named MSS., and soon disappears; the same is true for final *th* in Western French—Modern French *contrée, loué*. But in Eastern French final *th*, to which Latin *t* between vowels had probably been reduced through *d* and *dh*, appears in the 12th century and later as *t*, rhyming on ordinary French final *t*—Picard and Burgundian *pechiet* (*peccātum*), *apeleit* (*appellātum*). In Western French some final *ths* were saved by being changed to *f*—Modern French *soif* (*sitim*), *mœuf* (obsolete, *modum*). English has one or two instances of final *th*, none of medial *dh*—*faith* (*foi, fidem*); middle English *caritep* (*charité, caritātem*), *druð* (Old French *dru*, Teutonic *drūd*); generally the consonant is lost—*country, charity*. Middle High German shows the Eastern French final consonant—*moraliteit* (*moralité, mōrālitātem*). (11.) *T* from Latin final *t*, if in an Old French unaccented syllable, begins to disappear in the Roland, where sometimes *aimet* (*amat*), sometimes *aime*, is required by the metre, and soon drops in all dialects. The Modern French *t* of *aime-t-il* and similar forms is an analogical insertion from such forms as *dort-il* (*dormit*), where the *t* has always existed. (12.) The change of the diphthong *ai* to *èi* and afterwards to *èè* (the doubling indicates length) had not taken place in the earliest French documents, words with *ai* assonating only on words with *a*; in the Roland such assonances occur, but those of *ai* on *è* are more frequent—*faire* (*facere*) assonating on *parastre* (*patraster*) and on *estes* (*estis*); and the MS. (half a century later than the poem) occasionally has *ei* and *e* for *ai*—*recleimet* (*reclāmat*), *desfere* (*disfacere*), the latter agreeing with the Modern French sound. Before nasals (as in *laine* = *lānam*) and *ié* (as in *payé* = *pācātum*), *ai* remained a diphthong up to the 16th century, being apparently *ei*, whose fate in this situation it has followed. English shows *ai* regularly before nasals and when final, and in a few other words—*vain* (*vain, vānum*), *pay* (*payer, pācāre*), *wait* (*guetter*, Teutonic *wahtēn*); but before most consonants it has usually *èè*—*peace* (*pais, pācem*), *feat* (*fait, factum*). (13.) The loss or transposition of *i* (= *y*-consonant) following the consonant ending an accented syllable begins in the 12th century—Early Old French *glorie* (*glōriam*), *estudie* (*studium*), *olie* (*olium*); Modern French *gloire, étude, huile*. English sometimes shows the earlier form—*glory, study;* sometimes the later—*dower* (*douaire*, Early Old French *doarie, dōtārium*), *oil* (*huile*). (14.) The vocalization of *l* preceded by a vowel and followed by a consonant becomes frequent at the end of the 12th century; when preceded by open *è*, an *a* developed before the *l* while this was a consonant—11th century *salse* (*salsa*), *beltet* (*bellitātem*), *solder* (*solidāre*): Modern French *sauce, beauté, souder*. In Parisian, final *èl* followed the fate of *èl* before a consonant, becoming the triphthong *èau*, but in Norman the vocalization did not take place, and the *l* was afterwards rejected—Modern French *ruisseau*, Modern Guernsey *russé* (*rīvicellum*). English words of French origin sometimes show *l* before a consonant, but the general form is *u*—*scald* (*échauder, excalidāre*), *Walter* (*Gautier*, Teutonic *Waldhari*); *sauce, beauty, soder*. Final *èl* is kept—*veal* (*veau, vitellum*), *seal* (*sceau, sigillum*). (15.) In the east and centre *éi* changes to *òi*, while the older sound is retained in the north-west and west—Norman *estreit* (*étroit, strictum*), *preie* (*proie, praedam*), 12th century Picard, Parisian, etc., *estroit, proie*. But the earliest (10th century) specimens of the latter group of dialects have *éi*—*pleier* (*ployer, plicāre*) Eulalia, *mettreiet* (*mettrait, mittere, habēbat*) Jonah. Parisian *òi*, whether from *ei* or from Old French *òi, ói*, became in the 15th century *uè* (spellings with *oue* or *oe* are not uncommon—*mirouer* for *miroir, mīrātōrium*), and in the following, in certain words, *è*, now writted *ai*—*française, connaître*, from *françois* (*franceis, frañciscum*), *conoistre* (*conuistre, cognōscere*); where it did not undergo the latter change it is now *ua* or *wa*—*roi* (*rei, rēgem*), *croix* (*cruis, crūcem*). Before nasals and palatal *l*, *ei* (now = *è*) was kept—*veine* (*vēna*), *veille* (*vigilā*), and it everywhere survives unlabialized in Modern Norman—Guernsey *ételle* (*étoile, stēlla*) with *é*, *ser* (*soir, sērum*) with *è*. English shows generally *ei* (or *ai*) for original *ei*—*strait* (*estreit*), *prey* (*preie*); but in several words the later Parisian *oi*—*coy* (*coi, qviētum*), *loyal* (*loyal, lēgālem*). (16.) The splitting of the vowel-sound from accented Latin *ō* or *u* not in position, represented in Old French by *o* and *u* indifferently, into *u*, *o* (before nasals), and *eu* (the latter at first a diphthong, now = German *ö*), is unknown to Western French till the 12th century, and is not general in the east. The sound in 11th century Norman was much nearer to *u* (Modern French *ou*) than to *ó* (Modern French *ô*), as the words borrowed by English show *uu* (at first written *u*, afterwards *ou* or *ow*), never *óó*; but was probably not quite *u*, as Modern Norman shows the same splitting of the sound as Parisian. Examples are—Early Old French *espose* or *espuse* (*spōnsam*), *nom* or *num* (*nōmen*), *flor* or *flur* (*flōrem*); Modern French *épouse, nom, fleur;* Modern Guernsey *goule* (*gueule, gulam*), *nom, flleur*. Modern Picard also shows *u*, which is the regular sound before *r*—*flour;* but Modern Burgundian often keeps the original Old French *ó*—*vo* (*vous, vōs*). English shows almost always *uu*—*spouse, noun, flower* (Early Middle English *spuse, nun, flur*); but *nephew* with *éu* (*neveu, nepōtem*). (17.) The loss of the *u* (or *w*) of *qu* dates from the end of the 12th century—Old French *quart* (*qvartum*), *quitier* (*qviētāre*) with *qu* = *kw*, Modern French *quart, quitter* with *qu* = *k*. In Walloon the *w* is preserved—*couâr* (*quart*), *cuitter;* as is the case in English—*quart, quit*. The *w* of *gw* seems to have been lost rather earlier, English having simple *g*—*gage* (*gaye*, older *guage*, Teutonic *wadi*), *guise* (*guise*, Teutonic *wīsa*). (18.) The change of the diphthong *òu* to *uu* did not take place till after the 12th century, such words as *Anjou* (*Andegāvum*) assonating in the Roland on *fort* (*fortem*); and did not occur in Picardy, where *òu* became *au*—*caus* from older *còus, còls* (*cous, collōs*) coinciding with *caus* from *calz* (*chauds, calidōs*). English keeps *òu* distinct from *uu*—*vault* for *vaut* (Modern French *voûte, volvitam*), *soder* (*souder, solidāre*). (19.) The change of the diphthong *ié* to simple *é* is specially Anglo-Norman; in Old French of the Continent these sounds never rhyme, in that of England they constantly do, and English words show, with rare exceptions, the simple vowel—*fierce* (Old French *fiers, ferus*), *chief* (*chief, caput*), with *ie* = *ee*; but *pannier* (*panier, panārium*). At the beginning of the modern period, Parisian dropped the *i* of *ie* when preceded by *ch* or *j*—*chef, abréger* (Old French *abregier, abbreviāre*); elsewhere (except in verbs) *ie* is retained—*fier* (*ferum*), *pitié* (*pietātem*). Modern Guernsey retains *ie* after *ch*—*ap'rchier* (*approcher, adpropeāre*). (20.) Some of the Modern French changes have found their places under older ones; those remaining to be noticed are so recent that English examples of the older forms are superfluous. In the 16th century the diphthong *au* changed to *ao* and then to *ó*, its present sound, rendering, for instance, *maux* (Old French *mals, malōs*) identical with *mots* (*muttōs*). The *au* of *eau* underwent the same change, but its *e* was still sounded as *ə* (the *e* of *que*); in the next century this was dropped, making *veaux* (Old French *vëels, vitellōs*) identical with *vaux* (*vals, vallēs*). (21.) A more general and very important change began much earlier than the last; this is the loss of many final consonants. In Early Old French every consonant was pronounced as written; by degrees many of them disappeared when followed by another consonant, whether in the same word (in which case they were generally omitted in writing) or in a following one. This was the state of things in the 16th century; those final consonants which are usually silent in Modern French were still sounded, if before a vowel or at the end of a sentence or a line of poetry, but generally not elsewhere. Thus a large number of French words had two forms; the Old French *fort* appeared as *fòr* (though still written *fort*) before a consonant, *fòrt* elsewhere. At a later period final consonants were lost (with certain exceptions) when the word stood at the end of a sentence or of a line of poetry; but they are generally kept when followed by a word beginning with a vowel. (22.) A still later change is the general loss of the vowel (written *e*) of unaccented final syllables; this vowel preserved in the 16th century the sound *ə*, which it appears to have had in Early Old French. In later Anglo-Norman final *ə* (like every other sound) was treated exactly as the same sound in Middle English; that is, it came to be omitted or retained at pleasure, and in the 15th century disappeared. In Old French the loss of final ə is confined to a few words and forms; the 10th century *saveiet* (*sapēbat* for *sapiēbat*) became in the 11th *saveit*, and *ore* (*ad hōram*) *ele* (*illam*) develop the abbreviated *or*, *el*. In the 15th century ə before a vowel generally disappears—*mûr*, Old French *mëur* (*mātūrum*); and in the 16th, though still written, ə after an unaccented vowel, and in the syllable *ent* after a vowel, does the same—*vraiment*, Old French *vraiement* (*vērācā mente*); *avoient* two syllables, as now (*avaient*), in Old French three syllables (as *habēbant*). These phenomena occur much earlier in the anglicized French of England—14th century *aveynt* (Old French *aveient*). But the universal loss of final *e*, which has clipped a syllable from half the French vocabulary, did not take place till the 18th century, after the general loss of final consonants; *fort* and *forte*, distinguished at the end of a sentence or line in the 16th century as *fòrt* and *fòrtə*, remain distinguished, but as *fòr* and *fòrt*. The metre of poetry is still constructed on the obsolete pronunciation, which is even revived in singing; "dîtes, la jeune belle," actually four syllables (*dit, la zhœn bèl*), is considered as seven, fitted with music accordingly, and sung to fit the music (*ditə, la zhœnə bèlə*). (23.) In Old French, as in the other Romanic languages, the stress (force, accent) is on the syllable which was accented in Latin; compare the treatment of the accented and unaccented vowels in *latrō*, *amās*, giving *lére*, *áime*, and in *latrōnem*, *amātis*, giving *larón*, *améz*, the accented vowels being those which rhyme or assonate. At present, stress in French is much less marked than in English, German, or Italian, and is to a certain extent variable; which is partly the reason why most native French scholars find no difficulty in maintaining that the stress in living Modern French is on the same syllable as in Old French. The fact that stress in the French of to-day is independent of length (quantity) and pitch (tone) largely aids the confusion; for though the final and originally accented syllable (not counting the silent *e* as a syllable) is now generally pronounced with less force, it very often has a long vowel with raised pitch. In actual pronunciation the chief stress is usually on the first syllable (counting according to the sounds, not the spelling), but in many polysyllables it is on the last but one; thus in *caution* the accented (strong) syllable is *cau*, in *occasion* it is *ca*. Poetry is still written according to the original place of the stress; the rhyme-syllables of *larron*, *aimez* are still *ron* and *mez*, which when set to music receive an accented (strong) note, and are sung accordingly, though in speech the *la* and *ai* generally have the principal stress. In reading poetry, as distinguished from singing, the modern pronunciation is used, both as to the loss of the final ə and the displacement of the stress, the result being that the theoretical metre in which the poetry is written disappears. (24.) In certain cases accented vowels were lengthened in Old French, as before a lost *s*; this was indicated in the 16th century by a circumflex—*bête*, Old French *beste* (*bestiam*), *âme*, Old French *anme* (*anima*). The same occurred in the plural of many nouns, where a consonant was lost before the *s* of the flexion; thus singular *coc* with short vowel, plural *cos* with long. The plural *cos*, though spelt *coqs* instead of *cô* (=*kóó*), is still sometimes to be heard, but, like other similar ones, is generally refashioned after the singular, becoming *kòk*. In present French, except where a difference of quality has resulted, as in *côte* (Old French *coste*, *costam*) with ó and *cotte* (Old French *cote*) with ò, short and long vowels generally run together, quantity being now variable and uncertain; but at the beginning of this century the Early Modern distinctions appear to have been generally preserved.

(*d*) *Orthography*.—The history of French spellings is based on that of French sounds; as already stated, the former (apart from a few Latinisms in the earliest documents) for several centuries faithfully followed the latter. When the popular Latin of Gaul was first written, its sounds were represented by the letters of the Roman alphabet; but these were employed, not in the values they had in the time of Cæsar, but in those they had acquired in consequence of the phonetic changes that had meantime taken place. Thus, as the Latin sound *u* had become *ó* (close *o*) and *ū* had become *y* (French *u*, German *ü*), the letter *u* was used sometimes to denote the sound *ó*, sometimes the sound *y*; as Latin *k* (written *c*) had become *tsh* or *ts*, according to dialect, before *e* and *i*, *c* was used to represent those sounds as well as that of *k*. The chief features of early French orthography (apart from the specialties of individual MSS., especially the earliest) are therefore these:—*c* stood for *k* and *tsh* or *ts*; *d* for *d* and *dh* (soft *th*); *e* for *é*, *è*, and ə; *g* for *g* and *dzh*; *h* was often written in words of Latin origin where not sounded; *i* (*j*) stood for *i*, *y* consonant, and *dzh*; *o* for *ó* (Anglo-Norman *u*) and *ò*; *s* for *s* and *z*; *t* for *t* and *th*; *u* (*v*) for *ó* (Anglo-Norman *u*), *y*, and *v*; *y* (rare) for *i*; *z* for *dz* and *ts*. Some new sounds had also to be provided for: where *tsh* had to be distinguished from non-final *ts*, *ch*,—at first, as in Italian, denoting *k* before *i* and *e* (*chi*=*ki* from *qvī*)—was used for it; palatal *l* was represented by *ill*, which when final usually lost one *l*, and after *i* dropped its *i*; palatal *n* by *gn*, *ng*, or *ngn*, to which *i* was often prefixed; and the new letter *w*, originally *uu* (*vv*), and sometimes representing merely *uv* or *vu*, was employed for the consonant-sound still denoted by it in English. All combinations of vowel-letters represented diphthongs; thus *ai* denoted *a* followed by *i*, *ou* either *óu* or *òu*, *ui* either *ói* (Anglo-Norman *ui*) or *yi*, and similarly with the others—*ei*, *eu*, *oi*, *iu*, *ie*, *ue* (and *oe*), and the triphthong *ieu*. Silent letters, except initial *h* in Latin words, are very rare; though MSS. copied from older ones often retain letters whose sounds, though existing in the language of the author, had disappeared from that of the more modern scribe. The subsequent changes in orthography are due mainly to changes of sound, and find their explanation in the phonology. Thus, as Old French progresses, *s*, having become silent before voiced consonants, indicates only the length of the preceding vowel; *e* before nasals, from the change of *ẽ* (nasal *e*) to *ã* (nasal *a*), represents *ã*; *c*, from the change of *ts* to *s*, represents *s*; *qu* and *gu*, from the loss of the *w* of *kw* and *gw*, represent *k* and *g* (hard); *ai*, from the change of *ai* to *è*, represents *è*; *ou*, from the change of *òu* and *óu* to *u*, represents *u*; *ch* and *g*, from the change of *tsh* and *dzh* to *sh* and *zh*, represent *sh* and *zh*; *eu* and *ue*, originally representing diphthongs, represent *œ* (German *ö*); *z*, from the change of *ts* and *dz* to *s* and *z*, represents *s* and *z*. The new values of some of these letters were applied to words not originally spelt with them: Old French *k* before *i* and *e* was replaced by *qu* (*evesque*, *eveske*, Latin *episcopum*); Old French *u* and *o* for *ó*, after this sound had split into *eu* and *u*, were replaced in the latter case by *ou* (*rous*, for *ros* or *rus*, Latin *russum*); *s* was inserted to mark a long vowel (*pasle*, *pale*, Latin *pallidum*); *eu* replaced *ue* and *oe* (*neuf*, *nuef*, Latin *novum* and *novem*); *z* replaced *s* after *é* (*nez*, *nes*, *nāsum*). The use of *x* for final *s* is due to an orthographical mistake; the MS. contraction of *us* being something like *x* was at last confused with it (*iex* for *ieus*, *oculōs*), and, its meaning being forgotten, *u* was inserted before the *x* (*yeux*), which thus meant no more than *s*, and was used for it after other vowels (*voix* for *vois*, *vōcem*). As literature came to be extensively cultivated, traditional as distinct from phonetic spelling, began to be influential; and in the 14th century, the close of the Old French period, this influence, though not overpowering, was strong—stronger than in England at that time. About the same period there arose etymological as distinct from traditional spelling. This practice, the alteration of traditional spelling by the insertion or substitution of letters which occurred (or were supposed to occur) in the Latin (or supposed Latin) originals of the French words, became very prevalent in the three following centuries, when such forms as *debvoir* (*dēbēre*) for *devoir*, *faulx* (*falsum*) for *faus*, *autheur* (*auctōrem*, supposed to be *authōrem*) for *auteur*, *poids* (supposed to be from *pondus*, really from *pēnsum*) for *pois*, were the rule. But besides the etymological, there was a phonetic school of spelling (Ramus, for instance, writes, *èime*, *èimatẹs*—with *e*=*é*, *è*=*è*, and *ẹ*=ə—for *aimai*, *aimastes*), which, though unsuccessful on the whole, had some effect in correcting the excesses of the other, so that in the 17th century most of these inserted letters began to drop; of those which remain, some (*flegme* for *flemme* or *fleume*, Latin *phlegma*) have corrupted the pronunciation. Some important reforms—as the dropping of silent *s*, and its replacement by a circumflex over the vowel when this was long; the frequent distinction of close and open *e* by acute and grave accents; the restriction of *i* and *u* to the vowel sound of *j* and *v* to the consonant; and the introduction from Spain of the cedilla to distinguish *ç*=*s* from *c*=*k* before *a*, *u*, and *o*—are due to the 16th century. The replacement of *oi*, where it had assumed the value *è*, by *ai*, did not begin till the last century, and was not the rule till the present one. Indeed, since the 16th century the changes in French spelling have been very small, compared with the changes of the sounds; final consonants and final *e* (unaccented) are still written, though the sounds they represent have disappeared. French orthography is now quite as traditional and unphonetic as English, and gives an even falser notion than this of the actual state of the language it is supposed to represent. Many of the features of Old French orthography, early and late, are preserved in English orthography; to it we owe the use of *c* for *s* (Old English *c*=*k* only), of *j* (*i*) for *dzh*, of *v* (*u*) for *v* (in Old English written *f*), and probably of *ch* for *tsh*. The English *w* is purely French, the Old English letter being the runic ƿ. When French was introduced into England, *kw* had not lost its *w*, and the French *qu*, with that value, replaced the Old English cƿ (*queen* for cƿen). In Norman, Old French *ó* had become very like *u*, and in England went entirely into it; *o*, which was one of its French signs, thus came to be often used for *u* in English (*come* for *cume*). *U*, having often in Old French its Modern French value, was so used in England, and replaced the Old English *y* (*busy* for *bysi*, Middle English *brud* for *bryd*), and *y* was often used for *i* (*day* for *dai*). In the 13th century, when *ou* had come to represent *u* in France, it was borrowed by English, and used for the long sound of that vowel (*sour* for *sūr*); and *gu*, which had come to mean simply *g* (hard), was occasionally used to represent the sound *g* before *i* and *e* (*guess for gesse*). Some of the Early Modern etymological spellings were imitated in England; *fleum* and *autour* were replaced by *phlegm* and *authour*, the latter spelling having corrupted the pronunciation.

(*e*) *Inflexions.*—In the earliest Old French extant, the influence of analogy, especially in verbal forms, is very marked when these are compared with Latin (thus the present participles of all conjugations take *ant*, the ending of the first, Latin *antem*), and becomes stronger as the language progresses. Such isolated inflexional changes as *saveit* into *savoit*, which are cases of regular phonetic changes, are not noticed here.

i. *Verbs.*—(1.) In the oldest French texts the Latin pluperfect (with the sense of the perfect) occasionally occurs—*avret* (*habuerat*), *roveret* (*rogāverat*); it disappears early in the 12th century. (2.) The *u* of the ending of the 1st pers. plur. *mus* drops in Old French, except in the perfect, where its presence (as ə) is not yet satisfactorily explained—*amoms* (*amāmus*), but *amames* (*amāvimus*). In Picard the ending *mes* is extended to all tenses, giving *amomes*, etc. (3.) The replacement of the 2d plur. ending *eiz* (Latin *ētis*) by the *ez* (Latin *ātis*) of the first conjugation begins early in Norman; in the Roland both forms occur, *portereiz* (*portāre habētis*) assonating on *rei* (*roi*, *rēgem*), and the younger *porterez* on *citet* (*cité*, *cīvitātem*). In Eastern French, where *ez*, in accordance with phonetic laws, appears as *eiz*, *eiz* for the same reason becomes *oiz* and *ois*, and is found in the 13th century—*avois* and *avroiz* corresponding to *aveiz* (*habētis*) and *avreiz*, but *ameiz* to *amez* (*amātis*). (4.) In Eastern French the 1st plur., when preceded by *i*, has *e*, not *o*, before the nasal, while Western French has *u* (or *o*), as in the present; *posciomes* (*posseāmus*) in the Jonah homily makes it probable that the latter is the older form—Picard *aviemes*, Burgundian *avieus*, Norman *aviums* (*habēbāmus*). (5.) The subjunctive of the first conjugation has at first in the singular no final *e*, in accordance with the final vowel laws—*plur*, *plurs*, *plurt* (*plōrem*, *plōrēs*, *plōret*). The forms are gradually assimilated to those of the other conjugations, which, deriving from Latin *am*, *as*, *at*, have *e*, *es*, *e*(*t*); Modern French *pleure*, *pleures*, *pleure*, like *perde*, *perdes*, *perde* (*perdam*, *perdās*, *perdat*). (6.) In Old French the present subjunctive and the 1st sing. pres. ind. generally show the influence of the *i* or *e* of the Latin *iam*, *eam*, *iō*, *eō*—Old French *muire* or *moerge* (*moriat* for *moriātur*), *tiegne* or *tienge* (*teneat*), *muir* or *moerc* (*moriō* for *morior*), *tieng* or *tienc* (*teneō*). By degrees these forms are levelled under the other present forms—Modern French *meuer* and *meurs* following *meurt* (*morit* for *morītur*), *tienne* and *tiens* following *tient* (*tenet*). A few of the older forms remain—the vowel of *aie* (*habeam*) and *ai* (*habeō*) contrasting with that of *a* (*habet*). (7.) A levelling of which instances occur in the 11th century, but which is not yet complete, is that of the accented and unaccented stem-syllables of verbs. In Old French many verb-stems with shifting accent vary in accordance with phonetic laws—*parler* (*parabolāre*), *amer* (*amāre*) have in the present indicative *parol* (*parabolō*), *paroles* (*parabolās*), *parolet* (*parabolat*), *parlums* (*parabolāmus*), *parlez* (*parabolātis*), *parolent* (*parabolant*); *aim* (*amō*), *aimes* (*amās*), *aimet* (*amat*), *amums* (*amāmus*), *amez* (*amātis*), *aiment* (*amant*). In the first case the unaccented, in the second the accented form has prevailed—Modern French *parle*, *parler*; *aime*, *aimer*. In several verbs, as *tenir* (*tenēre*), the distinction is retained—*tiens*, *tiens*, *tient*, *tenons*, *tenez*, *tiennent*. (8.) In Old French, as stated above, *ié* instead of *é* from *a* occurs after a palatal (which, if a consonant, often split into *i* with a dental); the diphthong thus appears in several forms of many verbs of the 1st conjugation—*preier* (= *prei-ier*, *precāre*), *vengier* (*vindicāre*), *laissier* (*laxāre*), *aidier* (*adjūtāre*). At the close of the Old French period, those verbs in which the stem ends in a dental replace *ie* by the *e* of other verbs—Old French *laissier*, *aidier*, *laissiez* (*laxātis*), *aidiez* (*adjūtātis*); Modern French *laisser*, *aider*, *laissez*, *aidez*, by analogy of *aimer*, *aimez*. The older forms generally remain in Picard—*laissier*, *aidier*. (9.) The addition of *e* to the 1st sing. pres. ind. of all verbs of the first conjugation is rare before the 13th century, but is usual in the 15th; it is probably due to the analogy of the third person—Old French *chant* (*cantō*), *aim* (*amō*); Modern French *chante*, *aime*. (10.) In the 13th century *s* is occasionally added to the 1st pers. sing., except those ending in *e* (= ə) and *ai*, and to the 2d sing. of imperatives; at the close of the 16th century this becomes the rule, and extends to imperfects and conditionals in *oie* after the loss of their *e*. It appears to be due to the influence of the 2d pers. sing.—Old French *vend* (*vendō* and *vende*), *vendoie* (*vendēbam*), *parti* (*partīvī*), *ting* (*tenuī*); Modern French *vends*, *vendais*, *partis*, *tins*; and *donne* (*dōnā*) in certain cases becomes *donnes*. (11.) The 1st and 2d plur. of the pres. subj., which in Old French were generally similar to those of the indicative, gradually take an *i* before them, which is the rule after the 16th century—Old French *perdons* (*perdāmus*), *perdez* (*perdātis*); Modern French *perdions*, *perdiez*, apparently by analogy of the imp. ind. (12.) The loss in Late Old French of final *s*, *t*, etc., when preceding another consonant, caused many words to have in reality (though often concealed by orthography) double forms of inflexion—one without termination, the other with. Thus in the 16th century the 2d sing. pres. ind. *dors* (*dormīs*) and the 3d *dort* (*dormit*) were distinguished as *dòrz* and *dòrt* when before a vowel, as *dòrs* and *dòrt* at the end of a sentence or line of poetry, but ran together as *dòr* when followed by a consonant. Still later, the loss of the final consonant when not followed by a vowel further reduced the cases in which the forms were distinguished, so that the actual French conjugation is considerably simpler than is shown by the customary spellings, except when, in consequence of an immediately following vowel, the old terminations occasionally appear. Even here the antiquity is to a considerable extent artificial or delusive, some of the insertions being due to analogy, and the popular language often omitting the traditional consonant or inserting a different one. (13.) The subsequent general loss of *e* = ə in unaccented final syllables has still further reduced the inflexions, but not the distinctive forms—*perd* (*perdit*) and *perde* (*perdat*) being generally distinguished as *pèr* and *pèrd*, and before a vowel as *pèrt* and *pèrd*.

ii. *Substantives.*—(1.) In Early Old French (as in Provençal) there are two main declensions, the masculine and the feminine; with a few exceptions the former distinguishes nominative and accusative in both numbers, the latter in neither. The nom. and acc. sing. and acc. plur. mas. correspond to those of the Latin 2d or 3d declension, the nom. plur. to that of the 2d declension. The sing. fem. corresponds to the nom. and acc. of the Latin 1st declension, or to the acc. of the 3d; the plur. fem. to the acc. of the 1st declension, or to the nom. and acc. of the 3d. Thus masc. *tors* (*taurus*), *lere* (*latrō*); *tor* (*taurum*), *laron* (*latrōnem*); *tor* (*taurī*), *laron* (*latrōnī* for *-nēs*); *tors* (*taurōs*), *larons* (*latrōnēs*); but fem. only *ele* (*āla* and *ālam*), *flor* (*flōrem*); *eles* (*ālās*), *flores* (*flōrēs* nom. and acc.). At the end of the 11th century feminines not ending in *e* = ə take, by analogy of the masculines, *s* in the nom. sing., thus distinguishing nom. *flors* from acc. *flor*. A century later, masculines without *s* in the nom. sing. takes this consonant by analogy of the other masculines, giving *leres* as nom. similar to *tores*. In Anglo-Norman the accusative forms very early begin to replace the nominative, and soon supersede them, the language following the tendency of contemporaneous English. In Continental French the declension-system was preserved much longer, and did not break up till the 14th century, though acc. forms are occasionally substituted for nom. (rarely nom. for acc.) before that date. In the 15th century the modern system of one case is fully established; the form kept is almost always the accusative (sing. without *s*, plural with *s*), but in a few words, such as *fils* (*fīlius*), *sœur* (*soror*), the nom. survives in the sing., and occasionally both forms exist, in different senses—*sire* (*senior*) and *seigneur* (*seniōrem*), *on* (*homō*) and *homme* (*hominem*). (2.) Latin neuters are generally masculine in Old French, and inflected according to their analogy, as *ciels* (*caelus* for *caelum* nom.) *ciel* (*caelum* acc.), *ciel* (*caelī* for *caela* nom.), *ciels* (*caelōs* for *caela* acc.); but early cases of nom. sing. without *s* occur, which, if not due to substitution of acc. for nom., are the older forms (*ciel* = *caelum* nominative). Many neuters lose their singular form and treat the plural as a feminine singular, as in the related languages—*merveille* (*mīrābilia*), *feule* (*folia*). But in a few words the neuter plural termination is used, as in Italian, in its primitive sense—*carre* (*carra*, which exists as well as *carrī*), *deie*, later *doie* (*digita* for *digitī*); Modern French *chars*, *doigts*. This form became extinct after the 13th century—*paire* (Latin *paria*), in Old French both fem. sing. and neut. plur. (as Italian *paja* is fem. plur.), being now only the former. (3.) In Old French the inflexional *s* often causes phonetic changes in the stem; thus palatal *l* before *s* takes *t* after it, and becomes dental *l*, which afterwards changes to *u* or drops—*fil* (*fīlium* and *fīliī*) with palatal *l*, *filz* (*fīlius* and *fīliōs*), afterwards *fiz*, with *z* = *ts* (preserved in English *Fitz*), and then *fis*, as now (spelt *fils*). Many consonants before *s*, as the *t* of *fiz*, disappear, and *l* is vocalized—*vif* (*vīvum*), *mal* (*malum*), nominative sing. and acc. plur. *vis*, *maus* (earlier *mals*). These forms of the plural are retained in the 16th century, though often etymologically spelt with the consonant of the singular, as in *vifs*, pronounced *vis;* but in Late Modern French many of them disappear, *vifs*, with *f* sounded as in the singular, being the plural of *vif*, *bals* (formerly *baux*) that of *bal*. In many words, as *chant* (*cantūs*) and *champs* (*campōs*) with silent *t* and *p* (Old French *chans* in both cases), *maux* (Old French *mals*, sing. *mal*), *yeux* (*oculōs*, Old French *oelz*, sing. *oeil*) the old change in the stem is kept. Sometimes, as in *cieux* (*caelōs*) and *ciels*, the old traditional and the modern analogical forms coexist, with different meanings. (4.) The modern loss of final *s* (except when kept as *z* before a vowel) has seriously modified the French declension, the singulars *fort* (*fòr*) and *forte* (*fòrt*) being generally undistinguishable from their plurals *forts* and *fortes*. The subsequent loss of ə in finals has not affected the relation between sing. and plur. forms; but with the frequent recoining of the plural forms on the singular present Modern French has very often no distinction between sing. and plur., except before a vowel. Such plurals as *maux* have always been distinct from their singular *mal;* in those whose singular ends in *s* there never was any distinction, Old French *laz* (now spelt *lacs*) corresponding to *laqveus*, *laqveum*, *laqveī*, and *laqveōs*.

iii. *Adjectives.*—(1) The terminations of the cases and numbers of adjectives are the same as those of substantives, and are treated in the preceding paragraph. The feminine generally takes no *e* if the masc. has none, and if there is no distinction in Latin—fem. sing. *fort* (*fortem*), *grant* (*grandem*), fem. plur. *forz* (*fortēs*), *granz* (*grandēs*), like the acc. masc. Certain adjectives, which in Provençal take an *a* not existing in Latin, take the corresponding *e* in Old French—fem. *dulce* (*douce*, *dulcium* for *dulcem*, Provençal *dolza*), masc. *dulz* (*dulcem*). In the 11th century some other feminines, originally without *e*, begin in Norman to take this termination—*grande* (in a feminine assonance in the Alexis), plur. *grandes;* but other dialects generally preserve the original form till the 14th century. In the 16th century the *e* is general in the feminine, and is now universal, except in a few expressions—*grand' mère* (with erroneous apostrophe, *grandem mātrem*), *lettres royaux* (*līterās rēgālēs*), and most adverbs from adjectives in *-ant*, *-ent*—*couramment* (*currante* for *-ente mente*), *sciemment* (*sciente mente*). (2.) Several adjectives have in Modern French replaced the masc. by the feminine—Old French masc. *roit* (*rigidum*), fem. *roide* (*rigidam*); Modern French *roide* for both genders. (3.) In Old French several Latin simple comparatives are preserved—*maiur* (*majōrem*), nom. *maire* (*major*); *graignur* (*grandiōrem*), nom. *graindre* (*grandior*); only a few of these now survive—*pire* (*pejor*), *meilleur* (*meliōrem*), with their adverbial neuters *pis* (*pejus*), *mieux* (*melius*). The few simple superlatives found in Old French, as *merme* (*minimum*), *proisme* (*proximum*), *haltisme* (*altissimum*), are now extinct. (4.) The modern loss of many final consonants when not before vowels, and the subsequent loss of final ə, have greatly affected the distinction between the masc. and fem. of adjectives—*fort* and *forte* are still distinguished as *fòr* and *fòrt*, but *amer* (*amārum*) and *amère* (*amāram*), with their plurals *amers* and *amères*, have run together.

(*f*) *Derivation.*—Most of the Old French prefixes and suffixes are descendants of Latin ones, but a few are Celtic (*et*=*ittum*) or Teutonic (*ard*=*hard*), and some are later borrowings from Latin (*arie*, afterwards *aire*, from *ārium*). In Modern French many old affixes are hardly used for forming new words; the inherited *ier* (*ārium*) is yielding to the borrowed *aire*, the popular *contre* (*contrā*) to the learned *anti* (Greek), and the native *ée* (*ātam*) to the Italian *ade*. The suffixes of many words have been assimilated to more common ones; thus *sengler* (*siñgulārem*) is now *sanglier*.

(*g*) *Syntax.*—Old French syntax, gradually changing from the 10th to the 14th century, has a character of its own, distinct from that of Modern French; though when compared with Latin syntax it appears decidedly modern.

(1.) The general formal distinction between nominative and accusative is the chief feature which causes French syntax to resemble that of Latin and differ from that of the modern language; and as the distinction had to be replaced by a comparatively fixed word-order, a serious loss of freedom ensued. If the forms are modernized while the word-order is kept, the Old French *l'archevesque ne puet flechir li reis Henris* (Latin *archiepiscopum nōn potest flectere rēx Henrīcus*) assumes a totally different meaning—*l'archevêque ne puet fléchir le roi Henri*. (2.) The replacement of the nominative form of nouns by the accusative is itself a syntactical feature, though treated above under inflection. A more modern instance is exhibited by the personal pronouns, which, when not immediately the subject of a verb, occasionally take even in Old French, and regularly in the 16th century, the accusative form; the Old French *je qui sui* (*ego qvī sum*) becomes *moi qui suis*, though the older usage survives in the legal phrase *je, soussigné*. . . . (3.) The definite article is now required in many cases where Old French dispenses with it—*jo cunquis Engleterre*, *suffrir mort* (as Modern French *avoir faim*); Modern French *l'Angleterre*, *la mort*. (4.) Old French had distinct pronouns for "this" and "that"—*cest* (*ecce istum*) and *cel* (*ecce illum*), with their cases. Both exist in the 16th century, but the present language employs *cet* as adjective, *cel* as substantive, in both meanings, marking the old distinction by affixing the adverbs *ci* and *là*—*cet homme-ci*, *cet homme-là; celui-ci*, *celui-là*. (5.) In Old French, the verbal terminations being clear, the subject pronoun is usually not expressed—*si ferai* (*sīc facere habeō*), *est durs* (*dūrus est*), *que feras* (*qvid facere habēs*)? In the 16th century the use of the pronoun is general, and is now universal, except in one or two impersonal phrases, as *n'importe*, *peu s'en faut*. (6.) The present participle in Old French in its uninflected form coincided with the gerund (*amant*=*amantem* and *amandō*), and in the modern language has been replaced by the latter, except where it has become adjectival; the Old French *complaingnans leur dolours* (Latin *plañgentēs*) is now *plaignant leurs douleurs* (Latin *plañgendō*). The now extinct use of *estre* with the participle present for the simple verb is not uncommon in Old French down to the 16th century —*sont disanz* (*sunt dīcentēs*) = Modern French *ils disent* (as English *they are saying*). (7.) In present Modern French the preterite participle when used with *avoir* to form verb-tenses is invariable, except when the object precedes (an exception now unknown to the conversational language)—*j'ai écrit les lettres*, *les lettres que j'ai écrites*. In Old French down to the 16th century, formal concord was more common (though by no means necessary), partly because the object preceded the participle much oftener than now—*ad la culur muée* (*habet colōrem mūtātam*), *ad faite sa venjance*, *les turs ad rendues*. (8.) The sentences just quoted will serve as specimens of the freedom of Old French word-order,—the object standing either before verb and participle, between them, or after both. The predicative adjective can stand before or after the verb—*halt sunt li pui* (Latin *podia*), *e tenebrus e grant*. (9.) In Old French *ne* (Early Old French *nen*, Latin *nōn*) suffices for the negation without *pas* (*passum*), *point* (*puñctum*) or *mie* (*mīcam*, now obsolete), though these are frequently used—*jo ne sui tis sire* (*je ne suis pas ton seigneur*), *autre feme nen ara* (*il n'aura pas autre femme*). In principal sentences Modern French uses *ne* by itself only in certain cases—*je ne puis marcher*, *je n'ai rien*. The slight weight as a negation usually attached to *ne* has caused several originally positive words to take a negative meaning,—*rien* (Latin *rem*) now meaning "nothing" as well as "something." (10.) In Old French interrogation was expressed with substantives as with pronouns by putting them after the verb—*est Saul entre les prophetes?* In Modern French the pronominal inversion (the substantive being prefixed) or a verbal periphrasis must be used—*Saul est-il*, or *est-ce que Saul est*.

(*h*) *Summary.*—Looking at the internal history of the French language as a whole, there is no such strongly marked division as exists between Old and Middle English, or even between Middle and Modern English. Some of the most important changes are quite modern, and are concealed by the traditional orthography; but, even making allowance for this, the difference between French of the 11th century and that of the 19th is less than that between English of the same dates. The most important change in itself and for its effects is probably that which is usually made the division between Old and Modern French, the loss of the formal distinction between nominative and accusative; next to this are perhaps the gradual loss of many final consonants, the still recent loss of the vowel of unaccented final syllables, and the extension of analogy in conjugation and declension. In its construction Old French is distinguished by a freedom strongly contrasting with the strictness of the modern language, and bears, as might be expected, a much stronger resemblance than the latter to the other Romanic dialects. In many features, indeed, both positive and negative, Modern French forms a class by itself, distinct in character from the other modern representatives of Latin.

IV. *Bibliography.*—The few works which treat of French philology as a whole are now in many respects antiquated, and the important discoveries of the last few years, which have revolutionized our ideas of Old French phonology and dialectology, are scattered in various editions, periodicals, and separate treatises. For many things Diez's *Grammatik der Romanischen Sprachen* (4th edition—a reprint of the 3d—Bonn, 1876–77; a French translation, Paris, 1872–75, is to be followed by a supplementary volume by G. Paris) is still very valuable; Burguy's *Grammaire de la Langue d'oïl* (2d edition—a reprint of the 1st—Berlin, 1869–70) is useful only as a collection of examples. G. Paris's edition of *La Vie de S. Alexis* (Paris, 1872) was the pioneer of, and retains an important place among, the recent original works on Old French; Darmesteter and Hatzfeld's *Le Seizième Siècle* (Paris, 1878) contains the first good account of Early Modern French. The leading periodicals now in existence are the *Romania* (Paris), founded (in 1872) and edited by P. Meyer and G. Paris; and the *Zeitschrift für Romanische Philologie* (Halle), founded (in 1877) and edited by G. Gröber. To these reference should be made for information as to the very numerous articles, treatises, and editions, by the many and often distinguished scholars who, especially in France and Germany, now prosecute the scientific study of the language. It may be well to mention that, Old French phonology especially being complicated, and as yet incompletely investigated, these publications, the views in which are of various degrees of value, require not mere acquiescent reading, but critical study. (H. N.)

PART IV.—FRENCH LITERATURE.

Origins.—The history of French literature in the proper sense of the term can hardly be said to extend further back than the 11th century. The actual manuscripts which we possess are seldom of older date than the century subsequent to this. But there is no doubt that by the end at least of the 11th century the French language, as a completely organized medium of literary expression, was in full, varied, and constant use. For many centuries previous to this literature had been composed in France, or by natives of that country, using the term France in its full modern acceptation; but until the 9th century, if not later, the written language of France, as far as we know, was Latin; and despite the practice of not a few literary historians, it does not seem reasonable to notice Latin writings in a history of French literature. Such a history properly busies itself only with the monuments of the French language from the time when the so-called Lingua Romana Rustica assumed a sufficiently independent form to deserve to be called a new language. This time it is indeed impossible exactly to determine, and the period at which literary compositions, as distinguished from mere conversation, began to employ the new tongue is entirely unknown, although much ingenuity has been spent on the effort approximately to discover it. The beginnings of literary composition come most naturally from the priest and the poet. As early as the 7th century the Lingua Romana, as distinguished from Latin and from Teutonic dialects, is mentioned, and this Lingua Romana would be of necessity used for purposes of clerical admonition, especially in the country districts, though we need not suppose that such addresses had a very literary character. On the other hand, the mention at early dates of certain *cantilenæ* or songs composed in the vulgar language has served for basis to a superstructure of much ingenious argument, not merely in reference to the chronological question, but also with regard to the highly interesting problem of the origin of the chansons de gestes, the earliest and one of the greatest literary developments of northern French. It is sufficient in this article, where speculation would be out of place, to mention that only two such cantilenæ have been traced, and that neither is French. One of the 9th century, the "Lay of Saucourt," is in a Teutonic dialect; the other, the "Song of St. Faron," is of the 7th century, but exists only in Latin prose, the construction and style of which present traces of translation from a poetical and vernacular original.

Early monuments.

As far as facts go, the most ancient monuments of the written French language consist of a few documents of very various character, ranging in date from the 9th to the 11th century. The oldest gives us the oaths interchanged at Strasburg in 842 between Charles the Bald and Louis the German. The next probably in date and the first in literary merit is a short song celebrating the martyrdom of St. Eulalia. The discussion indeed of these short and fragmentary pieces is of more philological than literary interest, and belongs rather to the head of French language. They are, however, evidence of the progress which, continuing for at least four centuries, built up a literary instrument out of the decomposed and reconstructed Latin of the Roman conquerors, blended with a certain limited amount of contributions from the Celtic and Iberian dialects of the original inhabitants, the Teutonic speech of the Franks, and the Oriental tongue of the Moors who pressed upwards from Spain. All these foreign elements, however, bear a very small proportion to the element of Latin; and as Latin furnished the greater part of the vocabulary and the grammar, so did it also furnish the principal models and helps to literary composition. The earliest French versification is evidently inherited from that of the Latin hymns of the church, and for a certain time Latin originals were followed in the choice of literary forms. But the original impulses of the new nation were too strong to content themselves with mere imitation, and it soon began to create afresh. By the 11th century it is tolerably certain that dramatic attempts were already being made, that lyric poetry was largely cultivated, that laws, charters, and such like documents were written in the vernacular, and that commentators and translators busied themselves with religious subjects and texts. But the most important development of the 11th century, and the one of which we are most certain, is that of which we have evidence remaining in the famous *Chanson de Roland*, so long hidden except in obscure allusions, and discovered in a manuscript at Oxford some forty years ago. This poem represents the first and greatest development of French literature, the chansons de gestes. The origin of these poems has been hotly debated, and it is only recently that the importance which they really possess has been accorded to them,—a fact the less remarkable in that, until the last half century, the hundred epics of ancient France were unknown, or known only through late and disfigured prose versions. There has long been a vague idea that Provençal literature preceded the literature which is properly called French, and this idea was helped by the natural prepossessions of Fauriel and Raynouard, the earliest authorities on old French who obtained a wide hearing. The attribution of the chansons de gestes to a Provençal origin necessitates indeed suppositions of the most extravagant character. We possess in round numbers a hundred of these chansons. Three only of them are in Provençal. Two of these, *Ferabras* and *Betonnet d'Hanstonne*, are obviously adaptations of French originals. The third, *Girartz de Rossilho* (Gerard de Roussillon), is undoubtedly Provençal, and is a work of great merit and originality, but its dialect is strongly tinged with the characteristics of the Langue d'Oil, and its author seems to have been a native of the debatable land between the two districts. To suppose under these circumstances that the Provençal originals of the hundred others, or even such Provençal originals as served for models to the trouvères, were completely and by a process of laborious selection destroyed in the Albigensian crusade, seems one of the most gratuitous hypotheses ever put forward, and would hardly require notice here were it not that it has found some credence in England. It is sufficient to say that not only is the chanson de geste the unquestionable property of northern France, but that it is in all probability older than the oldest troubadour whose works we possess. Nor is there much more authority for another widely entertained supposition that the early French poets merely versified with amplifications the stories of chroniclers. On the contrary, chroniclers like Philippe Mouskés and Alberic des Trois Fontaines draw largely from the chansons, and the question of priority between *Roland* and the pseudo-Turpin, though a hard one to determine, seems to resolve itself in favor of the former.

Epic poetry.

Chansons de Gestes.—Early French narrative poetry was divided by one of its own writers under three heads,—poems relating to French history, poems relating to ancient history, and poems of the Arthurian cycle. To the first only is the term chansons de gestes in strictness applicable. The definition of it goes partly by form and partly by matter. A chanson de geste must be written in verses either of ten or twelve syllables, the former being the earlier. These verses have a regular cæsura, which, like the end of a line, carries with it the license of a mute *e*. The lines are arranged, not in couplets or in stanzas of equal length, but in *laisses* or *tirades*, consisting of any number of lines from half a dozen to some hundreds. The lines are, in the earlier examples, assonanced,—that is to say, the vowel sound of the last syllables is identical, but the consonants need not agree. Thus, for instance, the final words of a tirade of *Amis et Amiles* (l. 199–206) are *erbe, nouvelle, selles, nouvelles, traversent, arrestent, guerre, cortége.* Sometimes the tirade is completed by a shorter line, and the later chansons are regularly rhymed. As to the subject, a chanson de geste must be concerned with some event which is, or is supposed to be, historical and French. The tendency of the trouvères was constantly to affiliate their heroes on a particular *geste* or family. The three chief *gestes* are those of Charlemagne himself, of Doon de Mayence, and of Garin de Monglane; but there are not a few chansons, notably those concerning the Lorrainers, and the remarkable series sometimes called the Chevalier au Cygne, and dealing with the crusades, which lie outside these groups. By this joint definition of form and subject the chansons de gestes are separated from the romances of antiquity, from the romances of the Round

Chansons de gestes.

Table, which are written in octosyllabic couplets, and from the Romans d'aventures or later fictitious tales, some of which, such as *Brun de la Montaigne*, are written in pure chanson form.

Volume and changes of early epics.

Not the least remarkable point about the chansons de gestes is their vast extent. Their number, according to the strictest definition, exceeds 100, and the length of each chanson varies from 1000 lines, or thereabouts, to 20,000 or even 30,000. The entire mass, including, it may be supposed, the various versions and extensions of each chanson, is said to amount to between two and three million lines; and when some twenty years ago the publication of the Carlovingian cycle was projected, it was estimated, taking the earliest versions alone, at over 300,000. The successive developments of the chansons de gestes may be illustrated by the fortunes of *Huon de Bordeaux*, one of the most lively, varied, and romantic of the older epics, and one which is interesting from the use made of it by Shakespeare, Wieland, and Weber. In the oldest form now extant, though even this is probably not the original, *Huon* consists of over 10,000 lines. A subsequent version contains 4000 more; and lastly, in the 14th century, a later poet has amplified the legend to the extent of 30,000 lines. When this point had been reached, *Huon* began to be turned into prose, and with many of his fellows was published and republished during the 15th and subsequent centuries, and retains, in the form of a roughly printed chap-book, the favor of the country districts of France to the present day. It is not, however, in the later versions that the special characteristics of the chansons de gestes are to be looked for. Of those which we possess, one and one only, the *Chanson de Roland*, belongs in its present form to the 11th century. Their date of production extends, speaking roughly, from the 11th to the 14th century, their palmy days from the 11th to the 12th. After this latter period the Arthurian romances, with more complex attractions, became their rivals, and induced their authors to make great changes in their style and subject. But for a time they reigned supreme, and no better instance of their popularity can be given than the fact that manuscripts of them exist, not merely in every French dialect, but in many cases in a strange macaronic jargon of mingled French and Italian. Two classes of persons were concerned in them. There was the trouvère who composed them, and the jongleur who carried them about in manuscript or in his memory from castle to castle and sang them, intermixing frequent appeals to his auditory for silence, declarations of the novelty and the strict copyright character of the chanson, revilings of rival minstrels, and frequently requests for money in plain words. Not a few of the manuscripts which we now possess appear to have been actually used by the jongleur. But the names of the authors, the trouvères who actually composed them, are in very few cases known, those of copyists, continuators, and mere possessors of manuscripts having been often mistaken for them.

The moral and poetical peculiarities of the older and more authentic of these chansons are strongly marked, though perhaps not quite so strongly as some of their encomiasts have contended, and as may appear to a reader of the most famous of them, the *Chanson de Roland*, alone. In that poem, indeed, war and religion are the sole motives employed, and its motto might be two lines from another of the finest chansons (*Aliscans*, 161–2):—

> "Dist à Bertran: 'N'avons mais nul losir
> Tant ke vivons alons paiens ferir.'"

In Roland there is no love-making whatever, and the hero's betrothed "la belle Aude" appears only in a casual gibe of her brother Oliver, and in the incident of her sudden death at the news of Roland's fall. M. Léon Gautier and others have drawn the conclusion that this stern and masculine character was a feature of all the older chansons, and that imitation of the Arthurian romance is the cause of its disappearance. This seems rather a hasty inference. In *Amis et Amile*, admittedly a poem of old date, the parts of Bellicent and Lubias are prominent, and the former is demonstrative enough. In *Aliscans* the part of the Countess Guibourc is both prominent and heroic, and is seconded by that of Queen Blancheflor and her daughter Aelis. We might also mention Oriabel in *Jourdans de Blaivies* and others. But it may be admitted that the sex which fights and counsels plays the principal part, that love adventures are not introduced at any great length, and that the lady usually spares her knight the trouble and possible indignities of wooing. The characters of a chanson of the older style are somewhat uniform. There is the hero who is unjustly suspected of guilt or sore beset by Saracens, the heroine who falls in love with him, the traitor who accuses him or delays help, who is almost always of the lineage of Ganelon, and whose ways form a very curious study. There are friendly paladins and subordinate traitors; there is Charlemagne (who bears throughout the marks of the epic king common to Arthur and Agamemnon, but is not in the earlier chanson the incapable and venal dotard which he becomes in the later), and with Charlemagne generally the duke Naimes of Bavaria, the one figure who is invariably wise, brave, loyal, and generous. In a few chansons there is to be added to these a very interesting class of personages who, though of low birth or condition, yet rescue the high-born knights from their enemies. Such are Rainoart in *Aliscans*, Gautier in *Gaydon*, Robastre in *Gaufrey*, Varocher in *Macaire*. These subjects, uniform rather than monotonous, are handled with great uniformity if not monotony of style. There are constant repetitions, and it sometimes seems, and may sometimes be the case, that the text is a mere cento of different and repeated versions. But the verse is generally harmonious and often stately. The recurrent assonances of the endless tirade soon impress the ear with a grateful music, and occasionally, and far more frequently than might be thought, passages of high poetry, such as the magnificent *Granz doel por la mort de Rollant*, appear to diversify the course of the story. The most remarkable of the chansons are *Roland*, *Aliscans*, *Gerard de Roussillon*, *Amis et Amile*, *Raoul de Cambrai*, *Garin le Loherain* and its sequel, *Les quatre Fils Aymon*, *Les Saisnes* (recounting the war of Charlemagne with Witekind), and lastly, *Le Chevalier au Cygne*, which is not a single poem but a series, dealing with the earlier crusades. It is remarkable that one chanson and one only, *Floovant*, deals with Merovingian times. But the chronology, geography, and historic facts of nearly all are, it is hardly necessary to say, mainly arbitrary.

Arthurian Romances.—The second class of early French epics consists of the Arthurian cycle, the earliest compositions of which are at least a century junior to the earliest chanson de geste, but which soon succeeded the chansons in popular favor, and obtained a vogue both wider and far more enduring. It is not easy to conceive a greater contrast in form, style, subject, and sentiment than is presented by the two classes. In both the religious sentiment is prominent, but the religion of the chansons is of the simplest, not to say of the most savage character. To pray to God and to kill his enemies constitutes the whole duty of man. In the romances the mystical element becomes on the contrary prominent, and furnishes in the Holy Grail one of the most important features. In the Carlovingian knight the courtesy and clemency which we have learnt to associate with chivalry are almost entirely absent. The *gentix bèr* contradicts, jeers at, and execrates his sovereign and his fellows with the utmost freedom. He thinks nothing of striking his *cortoise moullier* so that the blood runs down her *cler vis*. If a servant or even an equal offends him, he will throw the offender into the fire, knock his brains out, or set his whiskers ablaze. The Arthurian knight is far more of the modern model in these respects. But his chief difference from his predecessor is undoubtedly in his amorous devotion to his beloved, who, if not morally superior to Bellicent, Floripas, Esclairmonde, and the other Carlovingian heroines, is somewhat less forward. Even in minute details the difference is strongly marked. The romances are in octosyllabic couplets or in prose, and their language is different from that of the chansons, and contains much fewer of the usual epic repetitions and stock phrases. A voluminous controversy has been held respecting the origin of these differences, and of the story or stories which were destined to receive such remarkable attention. It is sufficient to say here that the attempted production of early Breton originals is open to the gravest suspicion, and that Geoffrey of Monmouth's account of his Armorican text-book meets with little credence. M. Paulin Paris seems to have clearly proved that nothing older than Nennius can be produced, and that this and nothing else was Geoffrey's authority, so far as he had any. What we are at present concerned with, however, is a body of verse and prose composed in the latter part of the 12th century and later. The

Manners in early epics.

earliest romances bear the names of Walter Map and Robert de Borron, which are undoubtedly authentic. Later, we have the names of Helie de Borron, Luce de Gast, etc., which are probably fictitious. Walter Map is responsible for the *Saint Graal* and the *Quête du Saint Graal*, Robert de Borron for *Joseph d'Arimathie* and *Merlin*. *Artus* and part at least of *Lancelot du Lac* (the whole of which has been attributed to Walter Map) appear to be due to unknown authors. *Tristan* came later and has a stronger mixture of Celtic tradition. Latest of all came the great Arthurian miscellany of *Giron le Courtois*. Most of these works, though not all, are in prose. At the same time as Walter Map, or a little later, Chrétien de Troyes threw the legends of the Round Table into octosyllabic verse of a singularly spirited and picturesque character. The chief poems attributed to him are the *Chevalier au Lyon* (Sir Ewain of Wales), the *Chevalier à la Charette* (one of the episodes of *Lancelot*), *Eric et Enide*, *Tristan*, and *Percivale*. These poems, independently of their merit, which is great, had an extensive literary influence. They were translated by the German minnesingers, Wolfram von Eschenbach, Gottfried of Strasburg, and others. With the romances already referred to, which were mostly written in England and at the English court, Chrétien's poems complete the early forms of the Arthurian story, and supply the matter of it as it is best known to English readers in Malory's book. Nor does that book, though far later than the original forms, convey a very false impression of the characteristics of the older romances. Indeed, the Arthurian knight, his character and adventures, are so much better known than the heroes of the Carlovingian chanson that there is less need to dwell upon them. They had, however, as has been already pointed out, great influence upon their rivals, and their comparative fertility of invention, the much larger number of their *dramatis personæ*, and the greater variety of interests to which they appealed, sufficiently explain their increased popularity. The ordinary attractions of poetry are also more largely present in them than in the chansons; there is more description, more life, and less of the mere chronicle. They have been accused of relaxing morality, and there is perhaps some truth in the charge. But the change is after all one rather of manners than of morals, and what is lost in simplicity is gained in refinement. *Doon de Mayence* is a late chanson, and *Lancelot du Lac* is an early romance. But the two beautiful scenes in the former between Doon and Nicolette, in the latter between Lancelot, Galahault, Guinevere, and the Lady of Malehaut, may be compared as instances of the attitude of the two classes of poets towards the same subject.

Romances of Antiquity.—There is yet a third class of early narrative poems, differing from the two former in subject, but agreeing sometimes with one sometimes with the other in form. These are the classical romances which are not much later than those of Charlemagne and Arthur. The chief subjects with which their authors busied themselves were the conquests of Alexander and the siege of Troy, though other classical stories come in. The most remarkable of all is the romance of *Alixandre* by Lambert the Short and Alexander of Bernay. It has been said that the excellence of the twelve-syllabled verse used in this romance was the origin of the term alexandrine. The Trojan romances, on the other hand, are chiefly in octosyllabic verse, and the principal poem which treats of them is the *Roman de Troie* of Benoit de Ste. More. Both this poem and *Alixandre* are attributed to the last quarter of the 12th century. The authorities consulted for these poems, were, as may be supposed, none of the best. Dares Phrygius, Dictys Cretensis, the pseudo-Callisthenes supplied most of them. But the inexhaustible invention of the trouvères themselves was the chief authority consulted. The adventures of Medea, the wanderings of Alexander and the Trojan horse, were quite sufficient to spur on to exertion the minds which had been accustomed to spin a chanson of some 10,000 lines out of a casual allusion in some preceding poem. It is needless to say that anachronisms did not disturb them. From first to last the writers of the chansons had not in the least troubled themselves with attention to any such matters. Charlemagne himself had his life and exploits accommodated to the need of every poet who treats of him, and the same is the case with the heroes of antiquity. Indeed, Alexander is made in many respects a prototype of Charlemagne. He is regularly knighted, he has twelve peers, he holds tournaments, he has relations with Arthur, and comes in contact with fairies, he takes flights in the air, and so forth. There is perhaps more avowed imagination in these classical stories than in either of the other divisions of French epic poetry. Some of their authors even confess to the practice of fiction, while the trouvères of the chansons invariably assert the historical character of their facts and personages, and the authors of the Arthurian romances at least start from facts vouched for partly by national tradition partly by the authority of religion and the church. The classical romances, however, are important in two different ways. In the first place, they connect the early literature of France, however loosely, and with links of however dubious authenticity, with the great history and literature of the past. They show a certain amount of scholarship in their authors, and in their hearers they show a capacity of taking an interest in subjects which are not merely those directly connected with the village or the tribe. The chansons de gestes had shown the creative power and independent character of French literature. There is, at least about the earlier ones, nothing borrowed, traditional, or scholarly. They smack of the soil, and they rank France among the very few countries which, in this matter of indigenous growth, have yielded more than folk-songs and fireside tales. The Arthurian romances, less independent in origin, exhibit a wider range of view, a greater knowledge of human nature, and a more extensive command of the sources of poetical and romantic interest. The classical epics superadd the only ingredient necessary to an accomplished literature,—that is to say, the knowledge of what has been done by other peoples and other literatures already, and the readiness to take advantage of the materials thus supplied.

Romans d'Aventures.—These are the three earliest developments of French literature on the great scale. They led, however, to a fourth, which, though later in date than all except their latest forms, is so closely connected with them by literary and social considerations that it had best be mentioned here. This is the *roman d'aventures*, a title given to those almost avowedly fictitious poems which connect themselves neither with French history, with the Round Table, nor with the heroes of antiquity. These began to be written in the 13th century, and continued until the prose form of fiction became generally preferred. The later forms of the chansons de gestes and the Arthurian poems might indeed be well called romans d'aventures themselves. *Hugues Capet*, for instance, a chanson in form and class of subject, is certainly one of this latter kind in treatment. But for convenience' sake the definition we have given is preferable. The style and subject of these romans d'aventures are naturally extremely various. *Guillaume de Palerme* deals with the adventures of a Sicilian prince, who is befriended by a were-wolf; *Le Roman de l'Escoufle*, with a heroine whose ring is carried off by a sparrow-hawk (Escoufle) like Prince Camaralzaman's talisman; *Guy of Warwick*, with the well-known slayer of the dun cow; *Meraugis de Portléguez* is a sort of branch or offshoot of the romances of the Round Table. There is, in short, no possibility of classifying their subjects. The habit of writing in gestes, or of necessarily connecting the new work with an older one, had ceased to be binding, and the instinct of fiction writing was free; yet these romans d'aventures do not rank quite as high in literary importance as the classes which preceded them. This undervaluation arises rather from a lack of originality and distinctness of savor than from any shortcomings in treatment. Their versification, usually octosyllabic, is pleasant enough; but there is not much distinctness of character about them, and their incidents, commonly taken from some preceding *fabliau* or *lai*, often strike the reader with something of the sameness but nothing of the naïveté of those of the older poems. Nevertheless some of them attain to a very high popularity, such, for instance, as *Partenopex de Blois*. With them may be connected a large number of early romances and fictions of various dates in prose and verse, such as *Aucassin et Nicolette*, *Le Chatelain de Coucy*, *Le Roman de la Violette*, and others. This class possesses representatives in Provençal as well as in northern French, some of which, for instance, *Flamenca* and *Jaufrey*, are full of interest. But none of those smaller stories in verse, prose, or the two combined, can vie in charm with *Aucassin et Nicolette* (13th century), an exquisite literary presentment of mediæval sentiment in its most delightful form.

General characteristics of early narrative.

Spread of literary taste.

In these four classes may be said to be summed up the literature of feudal chivalry in France. They were all, except perhaps the last, composed by one class of persons, the trouvères, and performed by another, the jongleurs. The latter, indeed, sometimes presumed to compose for himself, and was denounced as a *troveor batard* by the indignant members of the superior caste. They were all originally intended to be performed in the *palais marberin* of the baron to an audience of knights and ladies, and, when reading became more common, to be read by such persons. They dealt therefore chiefly, if not exclusively, with the class to whom they were addressed. The bourgeois and the villain, personages of political nonentity at the time of their early composition, come in for the slightest possible notice. Occasionally in the few curious instances we have mentioned, persons of a class inferior to the seigneur play an important part, but this is rare. The habit of private wars and of insurrection against the sovereign supply the motives of the chanson de geste, the love of gallantry, adventure, and foreign travel those of the romances Arthurian and miscellaneous. None of these motives much affected the lower classes, who were, with the early developed temper of the middle and lower class Frenchman, already apt to think and speak cynically enough of tournaments, courts, crusades, and the other occupations of the nobility. The communal system was springing up, the towns were receiving royal encouragement as a counterpoise to the authority of the nobles. The corruptions and maladministration of the church attracted the satire rather of the citizens and peasantry who suffered by them, than of the nobles who had less to fear and even something to gain. On the other hand, the gradual spread of learning, inaccurate and ill-digested perhaps, but still learning, not only opened up new classes of subjects, but opened them to new classes of persons. The thousands of students who flocked to the schools of Paris were not all princes or nobles. Hence there arose two new classes of literature, one consisting of the embodiment of learning of one kind or other in the vulgar tongue, and ranging from the half-fabulous histories of the Jerseyman Wace, the Roman de Brut, and the Roman de Rou, to bestiaries such as that of Philippe de Thaun and popular treatises on science and morality. The other, one of the most remarkable developments of sportive literature which the world has seen, produced the second indigenous literary growth of which France can boast, namely, the fabliaux, and the almost more remarkable work which is an immense conglomerate of fabliaux, the great beast-epic of the Roman du Renart.

Fabliaux.—There are few literary products which have more originality and at the same time more diversity than the fabliau. The epic and the drama, even when they are independently produced, are similar in their main characteristics all the world over. But there is nothing in previous literature which exactly corresponds to the fabliau. It comes nearest to the Æsopic fable and its Eastern origins or parallels. But it differs from these in being less allegorical, less obviously moral (though a moral of some sort is usually if not always enforced), and in having a much more direct personal interest. It is in many degrees further removed from the parable, and many degrees nearer to the novel. The story is the first thing, the moral the second, and the latter is never suffered to interfere with the former. These observations apply only to the fabliaux, properly so called, but the term has been used with considerable looseness. The collectors of those interesting pieces, Barbazan, Méon, Le Grand d'Aussy, have included in their collections large numbers of miscellaneous pieces such as *dits* (rhymed descriptions of various objects), and *débats* (discussions between two persons or contrasts of the attributes of two things), sometimes even short romances, farces, and mystery plays. The fabliau proper, according to the definition of its latest editor, is "the recital, generally comic, of a real or possible incident occurring in ordinary human life." The comedy, it may be added, is usually of a satiric kind, and occupies itself with every class and rank of men, from the king to the villain. There is no limit to the variety of these lively verse-tales, which are invariably written in eight-syllabled couplets. Now the subject is the misadventure of two Englishmen, whose ignorance of the French language makes them ask for some donkey instead of some lamb; now it is the fortunes of an exceedingly foolish knight, who has an amiable and ingenious mother-in-law; now the deserved sufferings of an avaricious or ill-behaved priest; now the bringing of an ungrateful son to a better mind by the wisdom of babes and sucklings. Not a few of the *Canterbury Tales* are taken directly from fabliaux; indeed, Chaucer, with the possible exception of Prior, is our nearest approach to a fabliau writer. At the other end of Europe the prose novels of Boccaccio and other Italian tale-tellers are largely based upon fabliaux. But their influence in their own country was the greatest. They were the first expression of the spirit which has since animated the most national and popular developments of French literature. Simple and unpretending as they are in form, the fabliaux announce not merely the *Cent Nouvelles Nouvelles* and the *Heptameron*, *L'Avocat Patelin*, and *Pantagruel*, but also *L'Avare* and the *Roman Comique*, *Gil Blas*, and *Candide*. They indeed do more than merely prophesy the spirit of these great performances,—they directly lead to them. The prose-tale and the farce are the direct outcomes of the fabliau, and the prose-tale and the farce once given, the novel and the comedy inevitably follow.

Social importance of fabliaux.

The special period of fabliau composition appears to have been the 12th and 13th centuries. It signifies on the one side the growth of a lighter and more sportive spirit than had yet prevailed, on another the rise in importance of other and lower orders of men than the priest and the noble, on yet another the consciousness on the part of these lower orders of the defects of the two privileged classes, and of the shortcomings of the system of polity under which these privileged classes enjoyed their privileges. There is, however, in the fabliau proper not so very much of direct satire, this being indeed excluded by the definition given above, and by the thoroughly artistic spirit in which that definition is observed. The fabliaux are so numerous and so various that it is difficult to select any as specially representative. We may, however, mention, both as good examples and as interesting from their subsequent history, *Le Vair Palfroi*, treated in English by Leigh Hunt and by Peacock; *Le Vilain Mire*, the original of *Le Médecin malgré lui*; *Le Roi d'Angleterre et le Jongleur d'Eli*; *La Houce Partie*; *Le Sot Chevalier*, an indecorous but extremely amusing story; and *Les Deux Bordeors Ribaus*, a piece of great literary interest, as containing allusions to the chansons de gestes and romances most in vogue.

Roman du Renart.—If the fabliaux are not remarkable for direct satire, that element is supplied in more than compensating quantity by an extraordinary composition which is closely related to them. *Le Roman du Renart*, or *History of Reynard the Fox*, is a poem, or rather series of poems, which, from the end of the 12th to the middle of the 14th century, served the citizen poets of northern France, not merely as an outlet for literary expression, but also as a vehicle of satirical comment,—now on the general vices and weaknesses of humanity, now on the usual corruptions in church and state, now on the various historical events which occupied public attention from time to time. The enormous popularity of the subject is shown by the long vogue which it had, and by the empire which it exercised over generations of writers who differed from each other widely in style and temper. Nothing can be farther from the allegorical erudition, the political diatribes, and the sermonizing moralities of the authors of *Rénart le Contre-fait* than the sly naïveté of the writers of the earlier branches. Yet these and a long and unknown series of intermediate bards the fox-king pressed into his service, and it is scarcely too much to say that, during the two centuries of his reign, there was hardly a thought in the popular mind which, as it rose to the surface, did not find expression in an addition to the huge cycle of *Renart*.

We shall not deal with the controversies which have been raised as to the origin of the poem and its central idea. The latter may have been a travestie of real persons and actual events, or it may (and much more probably) have been an expression of thoughts and experiences which recur in every generation. France, the Netherlands, and Germany have contended for the honor of producing Renart; French, Flemish, German, and Latin for the honor of first describing him. It is sufficient to say that the spirit of the work seems to be more that of the border-land between France and Flanders than of any other district, and that, wherever the idea may have originally arisen, it was incomparably more fruitful in France than in any other country. The French poems which we possess on the subject amount in all to nearly 100,000 lines, independently of mere variations, but including the two different versions of *Renart le Contre-fait.* This vast total is divided into four different poems. The most ancient and remarkable is that edited by Méon under the title of *Roman du Renart,* and containing, with some additions made by M. Chabaille, 37 branches and about 32,000 lines. It must not, however, be supposed that this total forms a continuous poem like the *Æneid* or *Paradise Lost.* On the contrary, the separate branches are the work of different authors, hardly any of whom are known, and, but for their community of subject and to some extent of treatment, might be regarded as separate poems. The history of Renart, his victories over Isengrim, Bruin, and his other unfortunate rivals, his family affection, his outwittings of King Noble the Lion, and all the rest, are too well known to need fresh description here. It is perhaps in the subsequent poems, which are far less known and much less amusing, that the hold which the idea of Renart had obtained on the mind of northern France, and the ingenious uses to which it was put, are best shown. The first of these is *Le Couronnement Renart,* a poem of between 3000 and 4000 lines, attributed, on no grounds whatever, to the poetess Marie de France, and describing how the hero by his ingenuity got himself crowned king. This poem already shows signs of direct moral application and generalizing. These are still more apparent in *Renart le Nouvel,* a composition of some 8000 lines, written in the year 1288 by the Fleming Jacquemart Giélée. Here the personification of which, in noticing the *Roman de la Rose,* we shall soon have to give extended mention, becomes evident. Instead of or at least beside the lively personal Renart who used to steal sausages, set Isengrim fishing with his tail, or make use of Chanticleer's comb for a purpose for which it was certainly never intended, we have *Renardie,* an abstraction of guile and hypocrisy, triumphantly prevailing over other and better qualities. Lastly, as the *Roman de la Rose* of William of Lorris is paralleled by *Renart le Nouvel,* so its continuation by Jean de Meung is paralleled by the great miscellany of *Renart le Contre-fait,* which, even in its two existing versions (Ménage seems to have known a third), extends to fully 50,000 lines. Here we have, besides floods of miscellaneous erudition and discourse, political argument of the most direct and important kind. The wrongs of the lower orders are bitterly urged. They are almost openly incited to revolt, and it is scarcely too much to say, as M. Lenient has said, that the closely following Jacquerie is but a practical carrying out of the doctrines of the anonymous satirists of *Renart le Contre-fait.*

Early Lyric Poetry.—Side by side with these two forms of literature, the epics and romances of the higher classes, and the fabliau, which, at least in its original, represented rather the feelings of the lower, there grew up a third kind, consisting of purely lyrical poetry. The song literature of mediæval France is extremely abundant and beautiful. From the 12th to the 15th century it received constant accessions, some signed, some anonymous, some purely popular in their character, some the work of more learned writers, others again produced by members of the aristocracy. Of the latter class it may fairly be said that the catalogue of royal and noble authors boasts few if any names superior to those of Thibaut de Champagne, king of Navarre, and Charles d'Orléans, the father of Louis XII. Although much of this lyric poetry is anonymous, the more popular part of it almost entirely so, yet M. Paulin Paris has been able to enumerate some hundreds of French chansonniers between the 11th and the 13th century. The earliest song literature, chiefly known in the delightful collection of Bartsch (*Alt-Französische Romanzen und Pastourellen*), is mainly sentimental in character. The collector divides it under the two heads of romances and pastourelles, the former being usually the celebration of the loves of a noble knight and maiden, and recounting how Belle Doette or Eglantine or Oriour sat at her windows or in the tourney gallery, or embroidering silk and samite in her chamber, with her thoughts on Gerard or Guy or Henry,—the latter somewhat monotonous but naïve recitals, very often in the first person, of the meeting of an errant knight or minstrel with a shepherdess, and his cavalier but not always successful wooing. With these, some of which date from the 12th century, may be contrasted, at the other end of the mediæval period, the more varied and popular collection dating in their present form from the 15th century, and published recently by M. Gaston Paris. In both alike, making allowance for the difference of their age and the state of the language, may be noticed a charming lyrical faculty and great skill in the elaboration of light and suitable metres, skill to which the hitherto usual preference of the Provençal poets as metrists has done but scant justice. Especially remarkable is the abundance of refrains of an admirably melodious kind. It is said that more than 500 of these exist. Among the lyric writers of these four centuries whose names are known may be mentioned Audefroi le Bastard, the author of the charming song of *Belle Idoine,* and others no way inferior, Quesnes de Bethune, the ancestor of Sully, whose song-writing inclines to a satirical cast in many instances, the Vidame de Chartres, Charles d'Anjou, King John of Brienne, etc. But none of them, except perhaps Audefroi, can compare with Thibaut IV., who united by his possessions and ancestry a connection with the north and the south, and who employed the methods of both districts, but used the language of the north only. Thibaut was supposed to be the lover of Blanche of Castile, the mother of St. Louis, and a great deal of his verse is concerned with his love for her. But while knights and nobles were thus employing lyric poetry in courtly and sentimental verse, lyric forms were being freely employed by others, both of high and low birth, for more general purposes. Blanche and Thibaut themselves came in for contemporary lampoons, and both at this time and in the times immediately following, a cloud of writers composed light verse, sometimes of a lyric sometimes of a narrative kind, and sometimes in a mixture of both. By far the most remarkable of these is Rutebœuf (born in 1230), the first of a long series of French poets to whom in recent days the title Bohemian has been applied, who passed their lives between gayety and misery, and celebrated their lot in both conditions with copious verse. Rutebœuf is among the earliest French writers who tell us their personal history and make personal appeals. But he does not confine himself to these. He discusses the history of his times, upbraids the nobles for their desertion of the Latin empire of Constantinople, considers the expediency of crusading, inveighs against the religious orders, and takes part in the disputes between the pope and the king. He composes pious poetry too, and in at least one poem takes care to distinguish between the church which he venerates and the corrupt churchmen whom he lampoons. Besides Rutebœuf the most characteristic figure of his class and time is Adam de la Halle (*cir.* 1240–1286), commonly called the Hunchback of Arras. The earlier poems of Adam are of a sentimental character, the later ones satirical and somewhat ill-tempered. Such, for instance, is his invective against his native city. But his chief importance consists in his *jeux,* the *Jeu de la Feuillie,* the *Jeu de Robin et Marion,* dramatic compositions which led the way to the regular dramatic form. Indeed the general tendency of the 13th century is to satire, fable, and farce, even more than to serious or sentimental poetry. We should perhaps except the *lais,* the chief of which are known under the name of Marie de France. These lays are exclusively Breton in origin, though not in application, and the term seems originally to have had reference rather to the music to which they were sung than to the manner or matter of the pieces. Some resemblance to these lays may perhaps be traced in the Breton songs (perfectly trustworthy, which cannot be said of some more famous ones) published by M. Luzel. The subjects of the lais are indifferently taken from the Arthurian cycle, from ancient story, and from popular tradition. The most famous of all is the *Lay of the Honeysuckle,* traditionally assigned to Sir Tristram.

Audefroi le Bastard.

Thibaut de Champagne.

Rutebœuf.

Adam de la Halle.

Lais.

Satiric and Didactic Works.—Among the direct satirists of the Middle Ages, one of the earliest and foremost is Guyot de Provins, whose *Bible,* as he calls it, contains an elaborate satire on the time. The same spirit soon betrayed itself in curious travesties of the romances of chivalry, and sometimes invades the later specimens of these romances themselves. One of the earliest examples of the travestie is the remarkable composition entitled *Audigier.* This poem, half fabliau and half romance, is not so much an instance of the heroi-comic poems which afterwards found so much favor in Italy and elsewhere, as a direct and ferocious parody of the Carlovingian epic. The hero Audigier is a model of cowardice and disloyalty; his father and mother, Turgibus and Rainberge, are deformed and repulsive. The exploits of the hero himself are coarse and hideous failures, and the whole poem can only be taken as a counterblast to the spirit of chivalry. Elsewhere a trouvère, prophetic of Rabelais, describes a vast battle between all the nations of the world, the quarrel being suddenly atoned by the arrival of a holy man bearing a huge flagon of wine. Again, we have the history of a solemn crusade undertaken by the citizens of a country town against the neighboring castle. As erudition and the fancy for allegory gained ground, satire naturally availed itself of the opportunity thus afforded it; the disputes of Philippe le Bel with the pope and the Templars had an immense literary influence, partly in the concluding portions of the *Renart*, partly in the *Roman de Rose*, still to be mentioned, and partly in other satiric allegories of which the chief is the romance of *Fauvel*. The hero of this is an allegorical personage, half man and half horse, signifying the union of bestial degradation with human ingenuity and cunning. Fauvel is a divinity in his way. All the personages of state, from kings and popes to mendicant friars, pay their court to him.

Baudouin de Sebourc.

But this serious and discontented spirit betrays itself also in compositions which are not parodies or travesties in form. One of the latest, if not absolutely the latest, and yet not one of the least remarkable of the chanson de gestes is *Baudouin de Sebourc*, one of the members of the great romance or cycle of romances dealing with the crusades, and entitled Le Chevalier au Cygne. *Baudouin de Sebourc* dates from the early years of the 14th century. It is strictly a chanson de geste in form, and also in the general run of its incidents. The hero is dispossessed of his inheritance by the agency of traitors, fights his battle with the world and its injustice, and at last prevails over his enemy Gaufrois, who has succeeded in obtaining the kingdom of Friesland and almost that of France. Gaufrois has as his assistants two personages who were very popular in the poetry of the time,—the devil, namely, and money. These two sinister figures pervade the fabliaux, tales, and fantastic literature generally of the time. M. Lenient, the historian of French satire, has well remarked that a romance as long as the *Renart* might be spun out of the separate short poems of this period which have the devil for hero, and many of which form a very interesting transition between the fabliau and the mystery. But the devil is in one respect a far inferior hero to Renart. He has an adversary in the Virgin who constantly upsets his best-laid schemes, and who does not always treat him quite fairly. The abuse of usury at the time, and the exactions of the Jews and Lombards, were severely felt, and money itself, as personified, figures largely in the popular literature of the time.

William of Lorris.

Jean de Meung.

Roman de la Rose.—A work of very different importance from all of these, though with seeming touches of the same spirit, a work which deserves to take rank among the most important of the Middle Ages, is the *Roman de la Rose*,—one of the few really remarkable books which is the work of two authors, and that not in collaboration but in continuation one of the other. The author of the earlier part was Guillaume de Lorris, who lived in the first half of the 13th century; the author of the later part was Jean de Meung, who did not die until 1320, and whose part in the *Roman* dates at least from the extreme end of the preceding century. This great poem, while it has perforce attracted much attention, has suffered from the disrespect with which all nations, and the French perhaps more than any, are wont to treat literature that is out of date. Yet the *Roman de la Rose* is a great deal more interesting merely as literature, and without any antiquarian considerations, than a very large number of so-called classics. It exhibits in its two parts very different characteristics, which yet go to make up a not inharmonious whole. It is a love poem, and yet it is satire. But both gallantry and raillery are treated in an entirely allegorical spirit; and this allegory, while it makes the poem tedious to hasty appetites of to-day, was exactly what gave it its charm in the eyes of the Middle Ages. It might be described as an *Ars Amoris* crossed with a *Quodlibeta*. This mixture exactly hit the taste of the time, and continued to hit it for two centuries and a half. When its obvious and gallant meaning was attacked by moralists and theologians, it was easy to quote the example of the Canticles, and to furnish esoteric explanations of the allegory. The writers of the 16th century were never tired of quoting and explaining it. Antoine de Baif, indeed, gave the simple and obvious meaning, and declared that "La rose c'est d'amours le guerdon gracieux;" but Marot, on the other hand, gives us the choice of four mystical interpretations,—the rose being either the state of wisdom, the state of grace, the state of eternal happiness, or the Virgin herself. We cannot here analyze this celebrated poem. It is sufficient to say that the lover meets all sorts of obstacles in his pursuit of the rose, though he has for a guide the metaphorical personage Bel-Accueil. The early part, which belongs to William of Lorris, is remarkable for its gracious and fanciful descriptions. Forty years after Lorris's death, Jean de Meung completed it in an entirely different spirit. He keeps the allegorical form, and, indeed, introduces two new personages of importance, Nature and Faux-semblant. In the mouths of these personages and of another, Raison, he puts the most extraordinary mixture of erudition and satire. At one time we have the history of classical heroes, at another theories against the hoarding of money, about astronomy, about the duty of mankind to increase and multiply. Accounts of the origin of loyalty, which would have cost the poet his head at some periods of history, and even communistic ideas, are also to be found here. In Faux-semblant we have a real creation of the theatrical hypocrite. All this miscellaneous and apparently incongruous material really explains the success of the poem. It has the one characteristic which has at all times secured the popularity of great works of literature. It holds the mirror up firmly and fully to its age. As we find in Rabelais the characteristics of the Renaissance, in Montaigne those of the sceptical reaction from Renaissance and reform alike, in Molière those of the society of France after Richelieu had tamed and levelled it, in Voltaire and Rousseau respectively the two aspects of the great revolt,—so there are to be found in the *Roman de la Rose* the characteristics of the later Middle Age, its gallantry, its mysticism, its economical and social troubles and problems, its scholastic methods of thought, its naïve acceptance as science of everything that is written, and at the same time its shrewd and indiscriminate criticism of much that the age of criticism has accepted without doubt or question. The *Roman de la Rose*, as might be supposed, set the example of an immense literature of allegorical poetry, which flourished more and more until the Renaissance. Some of these poems we have already mentioned, some will have to be considered under the head of the 15th century. But, as usually happens in such cases and was certain to happen in this case, the allegory which has seemed tedious to many, even in the original, became almost intolerable in the majority of the imitations. To a great extent, however, it held its ground in forms more or less disguised. The tradition of allegorizing and personifying found refuge especially in the French classical tragedy, where the heroes of the school of Racine talk about their passions and their flames in a style by no means alien from that of William of Lorris.

Early didactic verse.

We have observed that, at least in the later section of the *Roman de la Rose*, there is observable a tendency to import into the poem indiscriminate erudition. This tendency is now remote from our poetical habits; but in its own day it was only the natural result of the use of poetry for all literary purposes. It was many centuries before prose became recognized as the proper vehicle for instruction, and at a very early date verse was used as well for educational and moral as for recreative and artistic purposes. French verse was the first born of all literary mediums in Modern European speech, and the resources of ancient learning were certainly not less accessible in France than in any other country. Dante, in his *De Vulgari Eloquio*, acknowledges the excellence of the didactic writers of the Langue d'Oil. We have already alluded to the *Bestiary* of Philippe de Thaun, a Norman trouvère who lived and wrote in England during the reign of Henry Beauclerc. Besides the *Bestiary*, which from its dedication to Queen Adela has been conjectured to belong to the third decade of the 12th century, Philippe wrote also in French a *Liber de Creaturis*, both works being translated from the Latin. These works of mystical and apocryphal physics and zoology became extremely popular in the succeeding centuries, and were frequently imitated. A moralizing turn was also given to them, which was much helped by the importation of several miscellanies of Oriental origin, partly tales, partly didactic in character, the most celebrated of which is the *Roman des Sept Sages*, which, under that title and the variant of *Dolopathos*, received repeated treatment from French writers both in prose and verse. The Æsopic fable, a similar mixture of instruction and amusement, had many cultivators, of whom Marie de France is the most remarkable. Art, too, soon demanded exposition in verse, as well as science. The favorite pastime of the chase was repeatedly dealt with, notably in the *Roi Modus*, 1325, mixed prose and verse; the *Deduits de la Chasse* of Gaston de Foix, 1387, prose; and the *Tresor de Venerie* of Hardouin, 1394, verse. Very soon didactic verse extended itself to all the arts and sciences. Vegetius and his military precepts had found a home in French octosyllables as early as the 12th century; the end of the same age saw the ceremonies of knighthood solemnly versified, and *napes* (maps) *du monde* also soon appeared. Finally, in 1245, Gautier of Metz translated from various Latin works into French verse a sort of encyclopædia. Profane knowledge was not the only subject which exercised didactic poets at this time. Religious handbooks and commentaries on the scriptures were common in the 13th and following centuries, and, under the title of *Castoiements, Enseignements*, and *Doctrinaux*, moral treatises became common. In the 14th century the influence of the *Roman de la Rose* helped to render moral verse frequent and popular. The same century, moreover, which witnessed these developments of well-intentioned if not always judicious erudition witnessed also a considerable change in lyrical poetry. Hitherto such poetry had chiefly been composed in the melodious but unconstrained forms of the romance and the pastourelle. Advancing taste, and possibly some echo of the refinements of the troubadours, induced the writers of northern France in the 14th century to subject themselves to severer rules, which, however, present no trace of being directly borrowed from the south. In this age arose the forms which for so long a time were to occupy French singers,—the ballade, the rondeau, the rondel, the triolet, the chant royal, and others. These received considerable alterations as time went on. We possess not a few *Artes Poeticæ*, such as those of Eustache Deschamps at the end of the 14th century, of Henri de Croy at the end of the 15th, and of Thomas Sibilet in the 16th, giving particulars of them, and these particulars show considerable changes. Thus the term rondeau, which since Villon has been chiefly limited to a poem of 15 lines, in which the 9th and 15th repeat the first words of the first, was originally applied both to the rondel, a poem of 13 or 14 lines, where the first two are twice repeated integrally, and to the triolet, one of 8 only, where the first line occurs three times and the second twice. The last is an especially popular metre, and is found where we should least expect it, in the dialogue of the early farces, the speakers making up triolets between them. As these three forms are closely connected, so are the ballade and the chant royal, the latter being an extended and more stately and difficult version of the former, and the characteristic of both being the identity of rhyme and refrain in the several stanzas. It is quite uncertain at what time these fashions were first cultivated, but the earliest poets who appear to have practised them extensively were born at the close of the 13th and the beginning of the 14th century. Of these Guillaume Machaut (1282 or 1295–1380) is the oldest. He has left us 80,000 verses, few of which have ever been printed. Eustache Deschamps (1328–1415) was nearly as prolific, but more fortunate and more meritorious, though a complete edition of him is only now promised. Froissart the historian (1333–1410) was also an agreeable poet. Deschamps, the most famous as a poet of the three, has left us nearly 1200 ballades and nearly 200 rondeaux, besides much other verse, all manifesting very considerable poetical powers. Less known but not less noteworthy is Jehannot de Lescurel, most of whose works are lost, but whose fragments are full of grace. Froissart appears to have had many countrymen in Hainault and Brabant who devoted themselves to the art of versification; and the *Livre des cent Ballades* of the Marshal Boucicault and his friends —*cir.* 1390—shows that the French gentleman of the 14th century was as apt at the ballade as his Elizabethan peer in England was at the sonnet.

Artificial forms of verse.

Early Drama.—Before passing to the prose writers of the Middle Ages, we have to take some notice of the dramatic productions of those times,—productions of an extremely interesting character, but, like the immense majority of mediæval literature, poetic in form. The origin or the revival of dramatic composition in France has been hotly debated, and it has been sometimes contended that the tradition of Latin comedy was never entirely lost, but was handed on chiefly in the convents by adaptations of the Terentian plays, such as those of the nun Hroswitha. There is no doubt that the mysteries (subjects taken from the sacred writings) and miracle plays (subjects taken from the legends of the saints and the Virgin) are of very early date. The mystery of the *Foolish Virgins* (partly French partly Latin), that of *Adam*, of *Saint Nicolas*, and perhaps others, are of the 12th century. But the latter moralities, soties, and farces seem to be also in part a very probable development of the simpler and earlier forms of the fabliau and of the tenson or jeuparti, a poem in simple dialogue much used by both troubadours and trouvères. The fabliau has been sufficiently dealt with already. It chiefly supplied the subject; and some miracle-plays and farces are little more than fabliaux thrown into dialogue. Of the jeux-partis there are many examples, varying from very simple questions and answers to something like regular dramatic dialogue; even short romances, such as *Aucassin et Nicolette*, were easily susceptible of dramatization. But the *Jeu de la Feuillie* of Adam de la Halle seems to be the earliest piece, profane in subject, containing something more than mere dialogue. The poet has not indeed gone far for his subject, for he brings in his own wife, father, and friends, the interest being complicated by the introduction of stock characters (the doctor, the monk, the fool), and of certain fairies—personages already popular from the later romances of chivalry. Another piece of Adam's, *Le Jeu de Robin et Marion*, also already alluded to, is little more than a simple throwing into action of an ordinary pastourelle. Nevertheless later criticism has seen, and not unreasonably, in these two pieces the origin in the one case of farce, and thus indirectly of comedy proper, in the other of comic opera.

Mysteries and miracles.

For a long time, however, the mystery and miracle-plays remained the staple of theatrical performance, and until the 13th century actors as well as performers were more or less taken from the clergy. It has, indeed, been well pointed out that the offices of the church were themselves dramatic performances, and required little more than development at the hands of the mystery writers. The occasional festive outbursts, such as the Feast of Fools, that of the Boy Bishop, and the rest, helped on the development. The variety of mysteries and miracles was very great. A single manuscript, now in course of publication, contains forty miracles of the Virgin, averaging from 1200 to 1500 lines each, written in octosyllabic couplets, and at least as old as the 14th century, most of them perhaps much earlier. The mysteries proper, or plays taken from the scriptures, are older still. Many of these are exceedingly long. There is a *Mystère de l'Ancien Testament*, which extends to many volumes, and must have taken weeks to act in its entirety. The *Mystère de la Passion*, though not quite so long, took several days, and recounts the whole history of the gospels. But these performances, though they held their ground until the middle of the 16th century, were soon rivalled by the more profane performances of the moralities, the farces, and the soties. The palmy time of all these three kinds is the 15th century, while the Confrérie de la Passion itself, the special performers of the sacred drama, only obtained the license constituting it by an ordinance of Charles VI. in 1402. In order, however, to take in the whole of the mediæval theatre at a glance, we may anticipate a little. The Confraternity was not itself the author or performer of the profaner kind of dramatic performance. This latter was due to two other bodies, the clerks of the Bazoche and the Enfans sans Souci. As the Confraternity was chiefly composed of tradesmen and persons very similar to Peter Quince and his associates, so the clerks of the Bazoche were members of the legal profession of Paris, and the Enfans sans Souci were mostly young men of family. The morality was the special property of the first, the sotie of the second. But as the moralities were sometimes decidedly tedious plays, though by no means brief, they were varied by the introduction of farces, of which the jeux already mentioned were the early germ, and of which *L'Avocat Patelin*, 200 years

Profane drama.

subsequent to Adam de la Halle, is the most famous example.

Moralities.

The morality was on the stage the natural result of the immense literary popularity of allegory in the *Roman de la Rose* and its imitations. There is hardly an abstraction, a virtue, a vice, a disease, or anything else of the kind, which does not figure in these compositions. There is Bien Advisé and Mal Advisé, the good boy and the bad boy of nursery stories, who fall in respectively with Faith, Reason, and Humility, and with Rashness, Luxury, and Folly. There is the hero Mange-Tout, who is invited to dinner by Banquet, and meets after dinner very unpleasant company in Colique, Goutte, and Hydropisie. It is even said that Cheese and Tart figured among the *dramatis personæ*, while Honte-de-dire-ses-Péchés seems an anticipation of Puritan nomenclature. Some of these moralities possess distinct dramatic merit; among these is mentioned *Les Blasphémateurs*, an early and remarkable presentation of the Don Juan story. But their general character appears to be gravity, not to say dulness. The Enfans sans Souci, on the other hand, were definitely satirical, and nothing if not amusing.

Soties.

The chief of the society was entitled Prince des Sots, and his crown was a hood decorated with asses' ears. The sotie was directly satirical, and only assumed the guise of folly as a stalking-horse for shooting wit. It was more Aristophanic than any other modern form of comedy, and, like its predecessor, it perished as a result of its political application. Encouraged for a moment as a political engine at the beginning of the 16th century, it was soon absolutely forbidden and put down, and had to give place in one direction to the lampoon and the prose pamphlet, in another to forms of comic satire more general and vague in their scope. The farce, on the other hand, having neither moral purpose nor political intention, was a purer work of art, enjoyed a wider range of subject, and was in no danger of any permanent extinction. Farcical interludes were interpolated in the mysteries themselves; short farces introduced and rendered palatable the moralities, while the sotie was itself but a variety of farce. It was a short composition, 500 verses being considered sufficient, while the morality might run to at least 1000 verses, the miracle-play to nearly double that number, and the mystery to some 40,000 or 50,000, or indeed to any length that the author could find in his heart to bestow upon the audience, or the audience in their patience to suffer from the author. The number of persons and societies who acted these performances grew to be very large, being estimated at more than 5000 towards the end of the 15th century. Many fantastic personages came to join the Prince des Sots, such as the Empereur de Galilée, the Princes de l'Étrille and des Nouveaux Mariés, the Roi de l'Épinette, the Recteur des Fous. Of the pieces which these societies represented one only, that of *Maitre Patelin*, is now much known; but many are almost equally amusing. *Patelin* itself has an immense number of versions and editions. Other farces are too numerous to attempt to classify; they bear, however, in their subjects, as in their manner, a remarkable resemblance to the fabliaux, their source. Conjugal disagreements, the unpleasantness of mothers-in-law, the shifty or, in the earlier stages, clumsy valet and chambermaid, the mishaps of too loosely given ecclesiastics, the abuses of relics and pardons, the extortion, violence, and sometimes cowardice of the seigneur and the soldiery, the corruption of justice, its delays, and its pompous apparatus, supply the subjects. The treatment is rather narrative than dramatic in most cases, as might be expected, but makes up by the liveliness of the dialogue for the deficiency of elaborately planned action and interest. All these forms, it will be observed, are directly or indirectly comic. Tragedy in the Middle Ages is represented only by the religious drama, except for a brief period towards the decline of that form, when what were called profane mysteries, such as those of the *Siege of Troy* and the *Siege of Orleans*, came to be represented. These were, however, rather histories, in the Elizabethan sense, than tragedies proper.

Prose History.—In France, as in all other countries of whose literary developments we have any record, literature in prose is considerably later than literature in verse. We have certain glosses or vocabularies possibly dating as far back as the 8th or even the 7th century; we have the Strasburg oaths, already described, of the 9th, and a commentary on the prophet Jonas which is probably as early. In the 10th century there are some charters and muniments in the vernacular; of the 11th the laws of William the Conqueror are the most important document; while the *Assises de Jérusalem* of Godfrey of Bouillon date, though not in the form in which we now possess them, from the same age. The 12th century gives us certain translations of the Scriptures, and the remarkable Arthurian romances already alluded to; and thenceforward French prose, though long less favored than verse, begins to grow in importance. History, as is natural, was the first subject which gave it a really satisfactory opportunity of developing its powers. For a time the French chroniclers contented themselves with Latin prose or with French verse, after the fashion of Wace and Philippe Mouskés.

Early chronicles.

But soon chronicles, first translated then original, became common; the earliest of all is said to have been that of the Pseudo-Turpin, which thus recovered in prose the language which had originally clothed it in verse, and which to gain a false appearance of authenticity it had exchanged for Latin. Then came French selections and versions from the great series of historical compositions undertaken by the monks of St. Denys, the so-called *Grandes Chroniques de France.* But the first really remarkable author who used French prose as a vehicle of historical expression is Geoffroi de Villehardouin, marshal of Champagne, who was born towards the middle of the 12th century, and died in Greece in 1213.

Villehardouin.

Under the title of *Conquête de Constantinoble* Villehardouin has left us a history of the fourth crusade, which has been accepted by all competent judges as the best picture extant of feudal chivalry in its prime. The *Conquête de Constantinoble* has been well called a chanson de geste in prose, and indeed the surprising nature of the feats it celebrates, the abundance of detail, and the vivid and picturesque poetry of the narration, equal the very best of the chansons. Even the repetition of the same phrases which is characteristic of epic poetry repeats itself in this epic prose; and as in the chansons so in Villehardouin, few motives appear but religious fervor and the love of fighting, though neither of these excludes a lively appetite for booty and a constant tendency to disunion and disorder. Villehardouin was continued by Henri de Valenciennes, whose work is less remarkable, and has more the appearance of a rhymed chronicle thrown into prose, a process which is known to have been actually applied in some cases. Nor is the transition from Villehardouin to Joinville (considerable in point of time, for Joinville was not born till ten years after Villehardouin's death) in point of literary history immediate. The rhymed chronicles of Philippe Mouskés and Guillaume Guiart belong to this interval; and in prose the most remarkable works are the *Chronique de Reims*, a well-written history, having the interesting characteristic of taking the lay and popular side, and the great work (977–1209) attributed to Baudouin d'Avesnes, and written both in French and Latin.

Joinville.

Joinville, whose special subject is the Life of St. Louis, is far more modern than even the half-century which separates him from Villehardouin would lead us to suppose. There is nothing of the knight-errant about him personally, notwithstanding his devotion to his hero. Our Lady of the Broken Lances is far from being his favorite saint. He is an admirable writer, but far less simple than Villehardouin; the good King Louis tries in vain to make him share his own rather highflown devotion. Joinville is shrewd, practical, there is even a touch of the Voltairian about him; but he, unlike his predecessor, has political ideas and antiquarian curiosity, and his descriptions are often very creditable pieces of deliberate literature.

It is very remarkable that each of the three last centuries of feudalism should have had one specially and extraordinarily gifted chronicler to describe it. What Villehardouin is to the 12th and Joinville to the 13th century, that Froissart is to the 14th.

Froissart.

His picture is the most famous as it is the most varied of the three, but it has special drawbacks as well as special merits. French critics have indeed been scarcely fair to Froissart, because of his early partiality to our own nation in the great quarrel of the time, forgetting that there was really no reason why he as a Hainaulter should take the French side. But there is no doubt that if the duty of an historian is to take in all the political problems of his time, Froissart certainly comes short of it. Although the feudal state in which knights and churchmen were alone of estimation was at the point of death, and though new orders of society were becoming important, though the distress and confusion of a transition state were evident to all, Froissart takes no notice of them. Society is still to him all knights and ladies, tournaments, skirmishes, and feasts. He depicts these, not like Joinville still less like Villehardouin, as a sharer in them, but with the facile and picturesque pen of a sympathizing literary onlooker. As the comparison of the *Conquête de Constantinoble* with a chanson de geste is inevitable, so is that of Froissart's *Chronique* with a roman d'aventures.

Troubadours.

Provençal Literature.—No account of French mediæval literature would be complete without at least some reference to the literary products of the Langue d'Oc. Provençal literature will receive separate treatment elsewhere, and here our chief business is to contrast briefly its developments with those of the Langue d'Oil. The older belief of the antecedence and originality of the troubadours has indeed been shown of late years to be false, and all evidence goes to prove that trouvère and troubadour were in the main independent of each other; while the creations of the former, if less artistically elaborate, were more varied, more considerable, and more fertile in their developments. The chanson de geste, the Arthurian romance, the fabliau, the allegoric poems of the type of the *Renart* and the *Rose*, the prose chronicle, the mystery, the farce, belong to the north; and the first developments of the epic in particular appear to have actually preceded the composition of finished literature in the south. The earliest accents of the troubadours are only heard at the extreme end of the 11th century. By the end of the 14th, less in consequence of the Albigensian crusade than of the political changes which that crusade eventually caused, they ceased. The 300 years between these terms were occupied by a literature more rich than varied. It is, however, too often forgotten that the literature of the Langue d'Oc is by no means confined to the productions of these famous minstrels. Two centuries before William of Poitiers, the earliest singer of the class (fl. 1087–1127), was written the Provençal poem on Boetius, the oldest monument that we have. It was, moreover, long after the extinction of the troubadour class that Provençal ceased for a time, except at long intervals, to be used as a literary language. But though the identification of Provençal literature with the lyric products of the troubadours is not scientifically correct, it is at least not destitute of a certain excuse. In this poetry alone are found works of an individual savor and a lasting interest, and had it not been for this, Provençal would have run the risk of being regarded as a mere dialect, perhaps even a *patois*. A few romances and tales, and the metrical chronicle describing the Albigensian war, sum up the longer compositions of the troubadours. On the other hand, their lyrical fecundity was extremely great, and their versification was most elaborate and correct, but their subjects were very limited. Love, war, and satire almost exhaust the list. The satire, moreover, is for the most part of a purely personal character, and entirely lacks the diversified historical and social interest which distinguishes the satirical poems of the Langue d'Oil. Nor are the war songs of the troubadours extremely numerous, the chief writer of them being the famous Bertrand de Born. Certain moral or didactic poems of their authorship also exist, but the bulk of their compositions deals with the subject of love, and deals with it in a manner for which, while its sweetness and grace have been universally recognized, the most ardent champions of the literary achievements of Provence and Languedoc have not been able to claim variety, vigor, or even, in the majority of cases, passion and truth. The alba, the serena, the pastorela, are alike open to the charge of monotony which has been brought against the northern equivalent of the latter, the pastourelle. The planh or complaint is also somewhat of a monotonous and unreal character; the tenson or verse dialogue and the ensenhamen or didactic epistle are apt to be dull; and the sirventé or satirical poem, though spirited enough, is apt, as we have said, to degenerate into the mere lampoon. So much for the disadvantages of Provençal verse, disadvantages which would scarcely require notice but for the contrast they present to the corresponding advantages of northern poetry. On the other hand, in its peculiar and somewhat limited way, Provençal poetry and the spirit which it expresses surpass anything which can be paralleled with them in northern French up to the date of their disappearance. The latter, except in the 15th and 16th centuries, and in our own time, has always been deficient in impassioned amatory poetry, while, on the other hand, the anonymous alba, "En un vergier sotz folha d'albespi," which Mr. Swinburne has finely paraphrased, stands at the head of almost all poetry of this class; and many of the fancies of the troubadours, such as the love of Geoffroi Rudel for the Lady of Tripoli, have fixed themselves durably in the literary imagination of Europe. But the great glory of the troubadours was their strenuous and successful attention to the formal part of poetry. Assisted by the melodious if somewhat monotonous cadences and terminations of their language, they framed most intricate and elaborate systems of verse and rhyme, which undoubtedly served as a stimulus to the trouvères their neighbors, and were very probably models for the creations in poetical form of the 14th century, such as the virelai, the rondel, the rondeau, the ballade, and the chant royal. The beauty and grace of Provençal poetry, and the melancholy fate of the nation which produced it, have naturally attracted much interest. But it must be remembered that the Albigensian crusade by no means, as is sometimes held, stamped out the troubadours. They continued for nearly a century after it to be prolific; and their extinction, though partly traceable to political causes, was in all probability equally owing to the inherent defects of their poetry, especially its lack of range. Soon afterwards Provençal ceased for 300 years to be, except fitfully and at long intervals, a literary language. In our own time a band of zealous devotees have attempted to revive it in that character, with what permanent success remains to be seen.

15th Century.—The 15th century holds a peculiar and somewhat disputed position in the history of French literature. It has sometimes been regarded as the final stage of the mediæval period, sometimes as the earliest of the modern, the influence of the Renaissance in Italy already filtering through. Others again have taken the easy step of marking it as an age of transition. There is as usual truth in all these views. Feudality died with Froissart and Eustache Deschamps. The modern spirit can hardly be said to arise before Rabelais and Ronsard. Yet the 15th century, from the point of view of French literature, is much more remarkable than its historians have been wont to confess. It has not the strongly marked and compact originality of some periods, and it furnishes only one name of the highest order of literary interest; but it abounds in names of the second rank, and the very difference which exists between their styles and characters testifies to the existence of a large number of separate forces working in their different manners on different persons. Its theatre we have already treated by anticipation, and to it we shall afterwards recur. It was the palmy time of the early French stage, and all the dramatic styles which we have enumerated then came to perfection. Of no other kind of literature can the same be said. The century which witnessed the invention of printing naturally devoted itself at first more to the spreading of old literature than to the production of new. Yet as it perfected the early drama, so it produced the prose tale. Nor, as regards individual and single names, can the century of Charles d'Orléans, of Alain Chartier, of Christine de Pisan, of Coquillart, of Comines, and, above all, of Villon, be said to lack illustrations.

Christine de Pisan.

Alain Chartier.

First among the poets of the period falls to be mentioned the shadowy personality of Olivier Basselin. Modern criticism has attacked the identity of the jovial miller, who was once supposed to have written and perhaps invented the songs called vaux de vire, and to have also carried on a patriotic warfare against the English. But though Jean le Houx may have written the poems published under Basselin's name two centuries later, it does not seem unlikely that an actual Olivier wrote actual vaux de vire at the beginning of the 15th century. About Christine de Pisan (1363–1420) and Alain Chartier (1386–1458) there is no such doubt. Christine was the daughter of an Italian astrologer who was patronized by Charles V. She was born in Italy but brought up in France, and she enriched the literature of her adopted country with much learning, good sense, and patriotism. She wrote history, devotional works, and poetry; and though her literary merit is not of the highest, it is very far from despicable. Alain Chartier, best known to modern readers by the story of Margaret of Scotland's Kiss, was a writer of a somewhat similar character. In both Christine and Chartier there is a great deal of rather heavy moralizing, and a great deal of rather pedantic erudition. But it is only fair to remember that the intolerable political and social evils of the day called for a good deal of moralizing, and that it was the function of the writers of this time to fill up as well as they could the scantily filled vessels of mediæval science and learning.

Charles d'Orléans.

A very different person is Charles d'Orléans (1391–1465), one of the greatest of *grands seigneurs*, for he was the father of a king of France and heir to the duchies of Orléans and Milan. Charles, indeed, was not exactly a hero; captured at Agincourt, he endured his English captivity very patiently, and its chief effect on him was to make him write poems in English. He made little effort to secure or recover his Cisalpine heritage from the rough hands of Sforza, and he seems at no time to have exercised much political influence in France. But if he was not a Roland or a Bayard, he was an admirable poet. He is the best-known and perhaps the best writer of the graceful poems in which an artificial versification is strictly observed, and helps by its recurrent lines and modulated rhymes to give to poetry something of a musical accompaniment even without the addition of music properly so called. His ballades are certainly inferior to those of Villon, but his rondels are unequalled. For full a century and a half these forms engrossed the attention of French lyrical poets. Exercises in them were produced in enormous numbers, and of an excellence which has only recently obtained full recognition even in France. Charles d'Orléans is himself sufficient proof of what can be done in them in the way of elegance, sweetness, and grace. On the other hand, his writings and the exercises to which he was addicted lay him open to a certain charge of effeminacy, which, though it has been much exaggerated, cannot be altogether denied. But that this effeminacy was no natural or inevitable fault of the ballades and the rondeaux was fully proved by the most remarkable literary figure of the 15th century in France.

Villon.

To François Villon (1431–1500), as to other great single writers, no attempt can be made to do justice in this place. His remarkable life and character especially lie outside our subject. But he is universally recognized as the most important single figure of French literature before the Renaissance. His work is very strange in form, the undoubtedly genuine part of it consisting merely of two compositions, known as the great and little testament, written in stanzas of eight lines of eight syllables each, with lyrical compositions in ballade and rondeau form interspersed. Nothing in old French literature can compare with the best of these, such as "the Ballade des dames du Temps Jadis," the "Ballade pour sa Mère," "La Grosse Margot," "Les Regrets de la belle Heaulmiere," and others; while the whole composition is full of poetical traits of the most extraordinary vigor, picturesqueness, and pathos. Besides these more remarkable names, a crowd of minor poets hastened to copy the compositions we have described. Towards the end of the century the poetical production of the time became very large. The artificial measures already alluded to, and others far more artificial and infinitely less beautiful, were largely practised. The typical poet of the end of the 15th century is Guillaume Crétin, who distinguished himself by writing verses with punning rhymes, verses ending with double or treble repetitions of the same sound, and many other tasteless absurdities, in which, as Pasquier remarks, "il perdit toute la grace et la liberté de la composition."

Crétin.

Crétin, who had hundreds of imitators, was held up by Rabelais to the ridicule of his readers under the name of Raminagrobis. The other favorite direction of the poetry of the time was a vein of allegorical moralizing drawn from the *Roman de la Rose* through the medium of Chartier and Christine, which produced "Castles of Love," "Temples of Honor," and such like; yet some of the minor poets of the time are not to be despised. Such are Baude (1430–1490), Martial d'Auvergne (1420–1508), and others, many of whom proceeded from the poetical court which Charles d'Orléans kept up at Blois after his release.

While the serious poetry of the age took this turn, there was no lack of lighter and satirical verse. Villon, indeed, were it not for the depth and pathos of his poetical sentiment, might be claimed as a poet of the lighter order, and the patriotic diatribes against the English to which we have alluded easily passed into satire. The political quarrels of the latter part of the century also provoked much satirical composition. The disputes of the Bien Public and those between Louis XI. and Charles of Burgundy employed many pens. The most remarkable piece of the light literature of the first is "Les Ânes Volants," a ballad on some of the early favorites of Louis. The battles of France and Burgundy were waged on paper between Gilles des Ormes and George Chastelain, typical representatives of the two styles of 15th century poetry already alluded to—Des Ormes being the lighter and more graceful writer, Chastelain a pompous and learned allegorist.

Coquillart.

The most remarkable representative of purely light poetry outside the theatre is Guillaume Coquillart, a lawyer of Champagne, who resided for the greater part of his life in Rheims. This city like others suffered from the pitiless tyranny of Louis XI. The beginnings of the standing army which Charles VII. had started were extremely unpopular, and the use to which his son put them by no means removed this unpopularity. Coquillart described the military man of the period in his *Monologue du Gendarme Cassé.* Again, when the king entertained the idea of unifying the taxes and laws of the different provinces, Coquillart, who was named commissioner for this purpose, wrote on the occasion a satire called *Les Droits Nouveaux.* A certain kind of satire, much less good-tempered than the earlier satire, became indeed common at this epoch. M. Lenient has well pointed out that a new satirical personification dominates this literature. It is no longer Renart with his cynical gayety, or the curiously travestied and almost amiable Devil of the Middle Ages. Now it is Death as an incident ever present to the imagination, celebrated in the thousand repetitions of the Danse Macabre, sculptured all over the buildings of the time, even frequently performed on holidays and in public. All through the century, too, anonymous verse of the lighter kind was written, some of it of great merit. The folk-songs already alluded to, published by M. G. Paris, show one side of this composition, and many of the pieces contained in M. de Montaiglon's extensive *Recueil des Anciennes Poésies Françaises* exhibit others.

The 15th century was perhaps more remarkable for its achievements in prose than in poetry. It produced, indeed, no prose writer of great distinction, except perhaps Comines; but it witnessed serious, if not extremely successful efforts at prose composition. The invention of printing finally substituted the reader for the listener, and when this substitution has been effected, the main inducement to treat unsuitable subjects in verse is gone. The study of the classics at first hand contributed to the same end. As early as 1458 the university of Paris had a Greek professor. But before this time translations in prose had been made. Nicholas Oresme, the tutor of Charles V., gave a version of certain Aristotelian works, which enriched the language with a large number of terms, then strange enough, now familiar. Raoul de Presles turned into French the *De Civitate Dei* of St. Augustine. These writers and Charles himself composed *Le Songe du Vergier*, an elaborate discussion of the power of the pope. The famous chancellor, Jean Gerson (1363–1429), to whom the *Imitation* has among so many others been attributed, spoke constantly and wrote often in the vulgar tongue. Christine de Pisan and Alain Chartier were at least as much prose writers as poets; and the latter, while he, like Gerson, dealt much with the reform of the church, used in his *Quadriloge Invective* really forcible language for the purpose of spurring on the nobles of France to put an end to her sufferings and evils. These moral and didactic treatises were but continuations of others, which for convenience' sake we have hitherto left unnoticed. Though verse was in the centuries prior to the 15th the favorite medium for literary composition, it was by no means the only one; and moral and educational treatises—some referred to above—already existed in pedestrian phrase. Certain household books (*Livres de Raison*) have been preserved, some of which date as far back as the 13th century. These contain not merely accounts but family chronicles, receipts, and the like. Of the 14th century, we have a *Menagier de Paris*, intended for the instruction of a young wife, and a large number of miscellaneous treatises of art, science, and morality, while private letters, mostly as yet unpublished, exist in considerable numbers, and are generally of the moralizing character; books of devotion, too, are naturally frequent.

But the most important divisions of mediæval energy in prose composition are the spoken exercises of the pulpit and the bar. The latter has been hitherto somewhat neglected, though the recent history of M. Aubertin devotes special attention to it. The beginnings, however, of French sermons have been much discussed, especially the question whether St. Bernard, whose discourses we possess in ancient but doubtfully contemporary French, pronounced them in that language or in Latin.

Early sermon writers.

Towards the end of the 12th century, however, the sermons of Maurice de Sully (died 1196) present the first undoubted examples of homiletics in the vernacular, and they are followed by many others—so many indeed that the 13th century alone counts 261 sermon writers, besides a large body of anonymous work. These sermons were, as might indeed be expected, chiefly cast in a somewhat scholastic form—theme, exordium, development, example, and peroration following in regular order. The 14th century sermons, on the other hand, are little known, probably because no one has yet taken the trouble to investigate the manuscripts. It must, however, be remembered that this age, as the most famous of all for its scholastic illustrations, and for the early vigor of the Dominican and Franciscan orders, ought to yield favorable returns. With the end of the century and the beginning of the 15th, the importance of the pulpit begins to revive. The early years of the new age have Gerson for their representative, while the end of the century sees the still more famous names of Menot (1450–1518), Maillard (1440–1502), and Raulin (1443–1514), all remarkable for the practice of a vigorous and homely style of oratory, recoiling before no aid of what we should now-a-days style buffoonery, and manifesting a creditable indifference to the indignation of principalities and powers. Louis XI. is said to have threatened to throw Maillard into the Seine, and many instances of the boldness of these preachers and the rough vigor of their oratory have been preserved. Froissart had been followed as a chronicler by Monstrelet, and by the historiographers of the Burgundian court, Chastelain, already mentioned, and Olivier de la Marche. The memoir and chronicle writers, who were to be of so much importance in French literature, also begin to be numerous at this period. Juvenal des Ursins (1388–1473), an anonymous bourgeois de Paris (two such indeed), and the author of the *Chronique Scandaleuse*, may be mentioned as presenting the character of minute observation and record which has distinguished the class ever since.

Comines.

But Comines (1445–1509) is no imitator of Froissart or of any one else. The last of the quartette of great French mediæval historians, he does not yield to any of his three predecessors in originality or merit, but he is very different from them. He fully represents the mania of the time for statecraft, and his book has long ranked with that of Macchiavelli as a manual of the art. He is a painter of character rather than of scenes or events; he has very few prejudices or predilections; he gives us an early example of those Renaissance statesmen who looked at politics chiefly as a game in which means are connected with ends, without much, if any, reference to the goodness or badness of the one or the other. But he has not the absolutely non-moral character of the Italian, and he is sincerely religious in his way. His memoirs, considered merely as literature, show a style well suited to their purport,—not, indeed, brilliant or picturesque, but clear, terse, and thoroughly well suited to the expression of the acuteness, observation, and common sense of their author.

But prose was not content with the domain of serious literature. It had already long possessed a respectable position as a vehicle of romance, and the end of the 14th and the beginning of the 15th centuries were pre-eminently the times when the epics of chivalry were re-edited and extended in prose. Few, however, of these extensions offer much literary interest. On the other hand, the best prose of the century, and almost the earliest which deserves the title of a satisfactory literary medium, was employed for the telling of romances in miniature. The *Cent Nouvelles Nouvelles* is undoubtedly the first work of literary prose in French, and the first, moreover, of a long and most remarkable series of literary works, in which French writers may challenge all comers with the certainty of victory. The short prose tale of a comic character is the one French literary product the pre-eminence and perfection of which it is impossible to dispute, and the prose tale first appears to advantage in the *Cent Nouvelles Nouvelles*.

The Cent Nouvelles Nouvelles.

This remarkable work has usually been attributed, like the somewhat similar but later *Heptameron*, to a knot of literary courtiers gathered round a royal personage, in this case the dauphin Louis, afterwards Louis XI. Some evidence has recently been produced which seems to show that this tradition, which attributed some of the tales to Louis himself, is erroneous, but the question is still undecided. The subjects of the *Cent Nouvelles Nouvelles* are by no means new. They are simply the old themes of the fabliaux treated in the old way. The novelty is in the application of prose to such a purpose, and in the crispness, the fluency, and the elegance of the prose used.

Antoine de la Salle.

The fortunate author to whom these admirable tales have of late been attributed is Antoine de la Salle (1398–1461), who, if this attribution and certain others be correct, must be allowed to be one of the most original and fertile authors of early French literature. La Salle's one acknowledged work is the story of *Petit Jehan de Saintré*, a short romance exhibiting great command of character and abundance of delicate draughtsmanship. To this it is now proposed to add the *Cent Nouvelles Nouvelles;* and the still more famous and important work of *L'Avocat Patelin* has been assigned by respectable authority to the same paternity. The generosity of critics towards La Salle has not even stopped here. A fourth masterpiece of the period, *Les Quinze Joies du Mariage*, has also been assigned to him. This last work, like the other three, is satirical in subject, and shows for the time a wonderful mastery of the language. Of the fifteen joys of marriage, or, in other words, the fifteen miseries of husbands, each has a chapter assigned to it, and each is treated with the peculiar mixture of gravity and ridicule which it requires. All who have read the book confess its infinite wit and the grace of its style. It is true that it has been reproached with cruelty and with a lack of the moral sentiment. But humanity and morality were not the strong point of the 15th century. There is, it must be admitted, about most of its productions a lack of poetry and a lack of imagination. The hideous disorders of the Hundred Years' War had exasperated men's minds, and had at the same time accustomed them to suffer, to witness, and in too many cases to perpetrate outrage and injustice of all kinds. The glaring disregard of anything but their own private interest which actuated almost all those of the higher orders, from the great crown vassals and princes of the blood to the leaders of free companions and the owners of petty fortresses, disgusted the people.

Influence of the Renaissance.

The great schism of the West, and the scandals which accompanied it, shook their confidence, not merely in individual ecclesiastics, but in the whole theory and government of the church. The old forms of literature had lost their interest, and new ones possessing strength to last and power to develop themselves had not yet appeared. It was impossible, even if the taste for it had survived, to spin out any longer the old themes. The new learning was slowly soaking in; the discoveries of the navigators of the Iberian peninsula were opening up entirely new regions for speculation and inquiry; and, above all, the decay of scholasticism was dismissing the most active minds of the time from the old mill-horse round, and setting them free to speculate, at once with all the ardor of reaction and with the vigor, the acuteness, and the trained logical skill which scholasticism itself had given them. But all these new forces required some time to set to work and to avail themselves of the tremendous weapon which the press had put into their hands. Even from a strictly material point of view, the horrible devastation occasioned by the English wars required a long time of reparation and recovery. The time actually accorded was not very long, and much of it might have been far better spent than under the influence of such a monarch as Louis XI. This period of brief and disturbed repose was, moreover, followed by the Italian wars, in which the French meted to another and weaker nation much the same measure as the English had meted to them. But these wars, little justifiable in themselves, completed the good effect which the equally unjustifiable violence and treachery of Louis XI. had begun. They consolidated the nation, they gave it a common hope, object, and spirit; they opened the way to deeds of daring in which it took pride, in place of the indiscriminate, brutal, and irrational savagery which had begun with the Jacquerie, and hardly ended with the quarrels of the Burgundians and Armagnacs. Not only did the lower orders gain in wealth, position, intelligence, and culture by the disasters of their superiors, but there arose a new chivalry, not, indeed, more moral than the old, but more polished, more learned, and more disposed to produce and enjoy literature. Under all these circumstances, literature of a varied and vigorous kind became once more possible and, indeed, necessary, nor did it take long to make its appearance.

16th Century.—In no country was the literary result of the Renaissance more striking and more manifold than in France. The double effect of the study of antiquity and the religious movement produced an outburst of literary developments of the most diverse kinds, which even the fierce and sanguinary civil dissensions to which the Reformation gave rise did not succeed in checking. While the Renaissance in Italy had mainly exhausted its effects by the beginning of the 16th century, while in Germany those effects only paved the way for a national literature, and did not themselves greatly contribute thereto, while in England it was not till the extreme end of the period that a great literature was forthcoming,—in France almost the whole century was marked by the production of capital works in every branch of literary effort. Not even the 17th century, and certainly no other till our own day, can show such a group of prose writers and poets as is formed by Calvin, St. Francis de Sales, Montaigne, Du Vair, Bodin, D'Aubigné, the authors of the *Satire Menippée*, Monluc, Brantôme, Pasquier, Rabelais, Des Periers, Herberay des Essarts, Amyot, Garnier, Marot, Ronsard and the rest of the Pléiade, and finally Regnier. These great writers are not merely remarkable for the vigor and originality of their thoughts, the freshness, variety, and grace of their fancy, the abundance of their learning, and the solidity of their arguments in the cases where argument is required. Their great merit is the creation of a language and a style able to give expression to these good gifts. The foregoing account of the mediæval literature of France will have shown sufficiently that it is not lawful to despise the literary capacities and achievements of the older French. But the old language, with all its merits, was ill-suited to be a vehicle for any but the simpler forms of literary composition. Pleasant or affecting tales could be told in it with interest and pathos. Songs of charming naïveté and grace could be sung; the requirements of the epic and the chronicle were suitably furnished. But its vocabulary was limited, not to say poor; it was barren of the terms of art and science; it did not readily lend itself to sustained eloquence, to impassioned poetry, or to logical discussion. It had been too long accustomed to leave these things to Latin as their natural and legitimate exponent, and it bore marks of its original character as a *lingua rustica*, a tongue suited for homely conversation, for folk-lore and for ballads, rather than for the business of the forum and the court, the speculations of the study, and the declamation of the theatre. Efforts had indeed been made, culminating in the heavy and tasteless erudition of the schools of Chartier and Crétin, to supply the defect; but it was reserved for the 16th century completely to efface it. The series of prose writers from Calvin to Montaigne, of poets from Marot to Regnier, elaborated a language yielding to no modern tongue in beauty, richness, flexibility, and strength,—a language which the reactionary purism of succeeding generations defaced rather than improved, and the merits of which have in our own time been triumphantly vindicated by the confession and the practice of all the greatest writers of modern France.

Marot.

Ronsard.

The Pléiade.

16th Century Poetry.—The first few years of the 16th century were naturally occupied rather with the last developments of the mediæval forms than with the production of the new model. The clerks of the Bazoche and the Confraternity of the Passion still produced and acted mysteries, moralities, and farces. Crétin, Le Maire, and Meschinot wrote elaborate allegorical and rhetorical poetry. Chansons de gestes, rhymed romances, and fabliaux had long ceased to be written. But the press was multiplying the contents of the former in the prose form which they had finally assumed, and in the *Cent Nouvelles Nouvelles* there already existed admirable specimens of the short prose tale. The first note of the new literature was sounded by Clément Marot (1497–1544). The son of an elder poet Jehan des Mares called Marot, Clément at first wrote, like his father's contemporaries, allegorical and mythological poetry, afterwards collected in a volume with a charming title, *L'Adolescence Clémentine.* Born in 1497, it was not till he was nearly thirty years old that his work became really remarkable. From that time forward till his death, about twenty years afterwards, he was much involved in the troubles and persecutions of the Huguenot party to which he belonged; nor was the protection of Marguerite d'Angoulême, the chief patroness of Huguenots and men of letters always efficient. But his troubles, so far from harming, helped his literary faculties; and his epistles, epigrams, *blasons* (descendants of the mediæval *dits*), and *coq-à-l'âne* became remarkable for their easy and polished style, their light and graceful wit, and a certain elegance which had not as yet been even attempted in any modern tongue, though the Italian humanists had not been far from it in some of their Latin compositions. Around Marot arose a whole school of disciples and imitators, such as Roger de Collerye, Brodeau (died 1540), the great authority on rondeaux, Scève, a fertile author of blasons, Salel, Marguerite herself (1492–1549), of whom more hereafter, and Melin de St. Gelais (1486–1558), of whom the first and the last are the most remarkable. Collerye is a poet of poverty, like so many other French bards from Rutebœuf downwards; St. Gelais, son of a poetic bishop of the same name (Octavien de St. Gelais, 1465–1502), is a courtly writer of occasional pieces, who sustained as well as he could the *style Marotique* against Ronsard, and who has the credit of introducing the regular sonnet into French. But the inventive vigor of the age was so great that one school had hardly become popular before another pushed it from its stool. Pierre de Ronsard (1524–1585) was the chief of this latter. At first a courtier and a diplomatist, physical disqualification made him change his career. He began to study the classics under Daurat, and with his master and five other writers, Jodelle, Belleau, Dubellay, Baif, and Pontus de Tyard, composed the famous "Pléiade." The object of this band was to bring the French language, in vocabulary, constructions, and application, on a level with the classical tongues by unlimited borrowings from the latter. They were not far from turning the whole Latin dictionary into the French tongue. They would have imported the Greek license of compound words, though the genius of the French language is but little adapted thereto; and they wished to reproduce in French the regular tragedy, the Pindaric and Horatian ode, the Virgilian epic, etc. Being all men of the highest talent, and not a few of them men of great genius, they achieved much that they designed, and even where they failed exactly to achieve it, they very often indirectly produced results as important and more beneficial than those which they intended. Their ideal of a separate poetical language distinct from that intended for prose use was indeed a doubtful if not a dangerous one, and the wholesale Latinizing and Hellenizing of their mother tongue, by which they aimed at it, was still more dangerous and doubtful. But it is certain that Marot, while setting an example of elegance and grace not easily to be imitated, set also an example of trivial and, so to speak, pedestrian language which was only too imitable. If France was ever to possess a literature containing something besides fabliaux and farces, the tongue must be enriched and strengthened. This accession of wealth and vigor it received from Ronsard and the Ronsardists. Doubtless they went too far, and provoked to some extent the reaction which Malherbe led. Their importations were indiscriminate, and sometimes unnecessary. It is almost impossible to read the *Franciade* of Ronsard, and not too easy to read the tragedies of Jodelle and Garnier, fine as the latter are in parts. But the best of Ronsard's sonnets and odes, the finest of Dubellay's *Antiquités de Rome* (translated into English by Spenser), the exquisite *Vanneur* of the same author, and the *Avril* of Belleau, even the finer passages of D'Aubigné and Du Bartas, are not only admirable in themselves, and of a kind not previously found in French literature, but are also such things as could not have been previously found, for the simple reason that the medium of expression was wanting. They constructed that medium for themselves, and no force of the reaction which they provoked was able to undo their work. Adverse criticism and the natural course of time rejected much that they had added. The charming diminutives they loved so much went out of fashion; their compounds (for the most part, it must be confessed, justly) had their letters of naturalization promptly cancelled; many a gorgeous adjective, including some which could trace their pedigree to the earliest ages of French literature, but which bore an unfortunate likeness to the new comers, was proscribed. But for all that no language has ever had its destiny influenced more powerfully and more beneficially by a small literary clique than the language of France was influenced by the example and disciples of that Ronsard whom for two centuries it was the fashion for the Malherbes and the Boileaux, and those who took their cue from them, to deride and decry.

The Ronsardists.

Du Bartas.

D'Aubigné.

In a sketch such as the present it is impossible to give a separate account of individual writers, the more important of whom will be found treated under their own names. The effort of the Pléiade proper was continued and partaken by a considerable number of minor poets. Olivier de Magny (d. 1560) and Louise Labé (b. 1526) were poets and lovers, the lady deserving far the higher rank in literature. There is more depth of passion in the writings of "La Belle Cordière," as this Lyonnese poetess was called, than in almost any of her contemporaries. Jacques Tahureau (1527–1555) scarcely deserves to be called a minor poet. There is less than the usual hyperbole in the contemporary comparison of him to Catullus, and he reminds an Englishman of the school represented nearly a century later by Carew, Randolph, and Suckling, though he possesses a sincerity and truth superior to anything to be found in those poets. The title of a part of his poems—*Mignardises de l'Admirée*—is characteristic both of the style and of the time. Doublet, Jamyn (1540–1605), and Delataille (1528–1590) deserve mention at least as poets, but two other writers require a longer allusion. Du Bartas (1544–1590) whom Sylvester's translation, Milton's imitation, and the copious citations of Southey's *Doctor*, have made known if not familiar in England, was partly a disciple and partly a rival of Ronsard. His poem of *Judith* was eclipsed by his better known *La Divine Sepmaine* or epic of the Creation. Du Bartas was a great user and abuser of the double compounds alluded to above, but his style possesses much stateliness, and has a peculiar solemn eloquence which he shared with the other French Calvinists, and which was derived from the study partly of Calvin and partly of the Bible. D'Aubigné (1550–1630), like Du Bartas, was a Calvinist. His genius was of a more varied character. He wrote sonnets and odes as became a Ronsardist, but his chief poetical work is the satirical poem of *Les Tragiques*, in which the author brands the factions, corruptions, and persecutions of the time, and in which there are to be found alexandrines of a strength, vigor, and original cadence hardly to be discovered elsewhere save in Corneille and Victor Hugo. Towards the end of the century Desportes (1546–1606) and Bertaut (1552–1611), with much enfeebled strength, but with a certain grace, continue the Ronsardizing tradition. Among their contemporaries must be noticed Passerat (1534–1602), a writer of much wit and vigor and rather resembling Marot than Ronsard, and Vauquelin de la Fresnaye (1536–1606), the author of a valuable *Ars Poetica* and of the first French satires which actually bear that title. Jean le Houx (fl. *cir.* 1600) continued, re-wrote, or invented the vaux de vire, commonly known as the work of Olivier Basselin, and already alluded to. A curious poetical trio is also formed at this time by Guy du Faur de Pibrac (1529–1584), Antoine Faure (1557–1624), and Pierre Mathieu (b. 1563), all authors of moral quatrains, which were learnt by heart in the schools of the time, replacing the distichs of the grammarian Cato, which, translated into French, had served the same purpose in the Middle Ages.

Regnier.

The nephew of Desportes, Mathurin Regnier, marks the end, and at the same time perhaps the climax, of the poetry of the century. A descendant at once of the older Gallic spirit of Villon and Marot, in virtue of his consummate acuteness, terseness, and wit, of the school of Ronsard by his erudition, his command of language, and his scholarship, Regnier is perhaps the best representative of French poetry at the critical time when it had got together all its materials, had lost none of its native vigor and force, and had not yet submitted to the cramping and numbing rules and restrictions which the next century introduced. The satirical poems of Regnier, and especially the admirable epistle to Rapin, in which he denounces and rebuts the critical dogmas of Malherbe, are models of nervous strength, while some of the elegies and odes contain expression not easily to be surpassed of the softer feelings of affection and regret. No poet has had more influence on the revival of French poetry in the last half-century than Regnier.

Regular tragedy and comedy.

Garnier.

16th Century Drama.—The change which dramatic poetry underwent during the 16th century was at least as remarkable as that undergone by poetry proper. The first half of the period saw the end of the religious mysteries, the license of which had irritated both the parliament and the clergy. Louis XII., at the beginning of the century, was far from discouraging the disorderly but popular and powerful theatre in which the Confraternity of the Passion, the clerks of the Bazoche, and the Enfans sans Souci enacted mysteries, moralities, soties, and farces. He made them, indeed, an instrument in his quarrel with the papacy, just as Philippe le Bel had made use of the allegorical poems of Jehan de Meung and his fellows. Under his patronage were produced the chief works of Gringore (1474–1534), by far the most remarkable writer of this class of composition. His *Prince des Sots* and his *Mystère de St. Louis* are among the best of their kind. An enormous volume of composition of this class was produced between 1500 and 1550. One morality by itself, *L'homme juste et l'homme mondain*, contains some 36,000 lines. But in 1548, when the Confraternity was formally established at the Hôtel de Bourgogne, leave to play sacred subjects was expressly refused it. Moralities and soties dragged on under difficulties till the end of the century, and the farce is immortal. But the effect of the Renaissance was to sweep away all other vestiges of the mediæval drama, at least in the capital. An entirely new class of subjects, entirely new modes of treatment, and a different kind of performers were introduced. The change naturally came from Italy. In the close relationship with that country which France had during the early years of the century, Italian translations of the classical masterpieces were easily imported. Soon French translations were made afresh of the *Electra*, the *Hecuba*, the *Iphigenia in Aulis*, and the French humanists hastened to compose original tragedies on the classic model. It was impossible that the Pléiade should not eagerly seize such an opportunity of carrying out its principles, and one of its members, Jodelle (1532–1573), devoting himself mainly to dramatic composition, fashioned at once the first tragedy, *Cléopatre*, and the first comedy, *Eugène*, thus setting the example of the style of composition which for two centuries and a half Frenchmen were to regard as the highest effort of literary ambition. The amateur performance of these dramas by Jodelle and his friends was followed by a Bacchic procession after the manner of the ancients, which caused a great deal of scandal, and was represented by both Catholics and Protestants as a pagan orgie. The *Cléopatre* is remarkable as being the first French tragedy, nor is it destitute of merit. It is curious that in this first instance the curt antithetic στιχομυθία, which was so long characteristic of French plays and plays imitated from them, and which Butler ridicules in his *Dialogue of Cat and Puss*, already appears. There appears also the grandiose and smooth but stilted declamation which came rather from the imitation of Seneca than of Sophocles, and the tradition of which was never to be lost. *Cléopatre* was followed by *Didon*, which, unlike its predecessor, is entirely in alexandrines, and observes the regular alternation of masculine and feminine rhymes. Jodelle was followed by Grévin (1540–1570) with a *Mort de César*, which shows an improvement in dramatic art, by Jacques de la Taille and others, such as Pierre Mathieu, who is strongly moral, and Jean de la Taille brother of Jacques. A very different poet from all these is Robert Garnier (1545–1601). Garnier is the first tragedian who deserves a place not too far below Rotrou, Corneille, Racine, Voltaire, and Hugo, and who may be placed in the same class with them. He chose his subjects indifferently from classical, sacred, and mediæval literature. *Sédécie*, a play dealing with the capture of Jerusalem by Nebuchadnezzar, is held to be his masterpiece, and *Bradamante* deserves notice because it is the first tragi-comedy of merit in French, and because the famous confidant here makes his first appearance. Garnier's successor, Antoine de Monchrétien (d. 1621), set the example of dramatizing contemporary subjects. His masterpiece is *L'Écossaise*, the first of many dramas on the fate of Mary Queen of Scots. While tragedy thus clings closely to antique models, comedy, as might be expected in the country of the fabliaux, is more independent. Italy had already a comic school of some originality, and the French farce was too vigorous and lively a production to permit of its being entirely overlooked. The Pléiade and their imitators made en-

Larivey.

deavors, without much success, to write comedies on the classical model, but the first comic writer of great merit was Pierre Larivey (1540–1611) (Giunto), an Italian by descent. Most if not all of his plays are founded on Italian originals, but the adaptations are made with the greatest freedom, and deserve the title of original works. The style is admirable, and the skilful management of the action contrasts strongly with the languor, the awkward adjustment, and the lack of dramatic interest found in contemporary tragedians.

16th Century Prose Fiction.—Great as is the importance of the 16th century in the history of French poetry, its importance in the history of French prose is greater still. In poetry the Middle Ages could fairly hold their own with any of the ages that have succeeded them. The epics of chivalry whether of the cycles of Charlemagne, Arthur, or the classic heroes, not to mention the miscellaneous romans d'aventures, have indeed more than held their own. Both relatively and absolutely the *Franciade* of the 16th century, the *Pucelle* of the 17th, the *Henriade* of the 18th, cut a very poor figure beside *Roland* and *Percivale, Gerard de Roussillon*, and *Parthenopex de Blois*. The romances, ballads, and pastourelles, signed and unsigned, of mediæval France were not merely the origin, but in some respects the superiors, of the lyric poetry which succeeded them. Thibaut de Champagne, Charles d'Orléans, and Villon need not veil their crests in any society of bards. The charming forms of the rondel, the rondeau, and the ballade have won admiration from every competent poet and critic who has known them. The fabliaux give something more than promise of La Fontaine, and the two great compositions of the *Roman du Renart* and the *Roman de la Rose*, despite their faults and their alloy, will always command the admiration of all persons of taste and judgment who take the trouble to study them. But while poetry had in the Middle Ages no reason to blush for her French representatives, prose (always the younger and less forward sister) had far less to boast of. With the exception of chronicles and prose romances, no prose works of any real importance can be quoted before the end of the 15th century, and even then the chief if not the only place of importance must be assigned to the *Cent Nouvelles Nouvelles*, a work of admirable prose, but necessarily light in character, and not yet demonstrating the efficacy of the French language as a medium of expression for serious and weighty thought. Up to the time of the Renaissance and the consequent reformation, Latin had, as we have already remarked, been considered the sufficient and natural organ for this expression. In France as in other countries the disturbance in religious thought may undoubtedly claim the glory of having repaired this disgrace of the vulgar tongue, and of having fitted and taught it to express whatever thoughts the theologian, the historian, the philosopher, the politician, and the savant had occasion to utter. But the use of prose as a vehicle for lighter themes was more continuous with the literature that preceded, and serves as a natural transition from poetry and the drama to history and science. Among the prose writers, therefore, of the 16th century we shall give the first place to the novelists and romantic writers.

Rabelais.

Among these there can be no doubt of the precedence, in every sense of the word, of François Rabelais (1495?–1553). No detailed account can here be attempted of this extraordinary person, the one French writer whom critics the least inclined to appreciate the characteristics of French literature have agreed to place among the few great writers of the world, and not far from Shakespeare and Dante. Immense ingenuity and research have been spent on the task of determining the origin and indebtedness of *Gargantua* and *Pantagruel*. It is sufficient to say that their form is roughly that of a prose roman d'aventures, that *Gargantua* is taken in outline from a burlesque romance of the same name, and that Panurge, who rather than Pantagruel is the hero of the second part, has some resemblance to Cingar, a personage of the macaronic poem of the Italian, Merlinus Coccaius or Folengo. But the borrowings of Rabelais are of little more importance than the borrowings of Shakespeare. With an immense erudition representing almost the whole of the knowledge of his time, with an untiring faculty of invention, with the judgment of a philosopher, and the common sense of a man of the world, with an observation that let no characteristic of the time pass unobserved, and with a ten-fold portion of the special Gallic gift of good-humored satire, Rabelais united a height of speculation and depth of insight and a vein of poetical imagination rarely found in any writer, but altogether portentous when taken in conjunction with his other characteristics. His great work has been taken for an exercise of transcendental philosophy, for a concealed theological polemic, for an allegorical history of this and that personage of his time, for a merely literary utterance, for an attempt to tickle the popular ear and taste. It is all of these, and it is none,—all of them in parts, none of them in deliberate and exclusive intention. It may perhaps be called the exposition and commentary of all the thoughts, feelings, aspirations, and knowledge of a particular time and nation put forth in attractive literary form by a man who for once combined the practical and the literary spirit, the power of knowledge and the power of expression. The work of Rabelais is the mirror of the 16th century in France, reflecting at once its comeliness and its uncomeliness, its high aspirations, its voluptuous appetites, its political and religious dissensions, its keen criticism, its eager appetite and hasty digestion of learning, its gleams of poetry, and its ferocity of manners. In Rabelais we can divine the Pléiade and Marot, the *Cymbalum Mundi* and Montaigne, Amyot and the *Amadis*, even Calvin and Duperron; and if in this lengthy mention of the curate of Meudon we have broken through our principle of allotting only scanty notice to individual authors, his unique representative character must be pleaded in excuse.

Des Periers.

The Heptameron.

It was inevitable that such extraordinary works as *Gargantua* and *Pantagruel* should attract special imitators in the direction of their outward form. It was also inevitable that this imitation should frequently fix upon those Rabelaisian characteristics which are least deserving of imitation, and most likely to be depraved in the hands of imitators. It fell within the plan of the master to indulge in what has been called *fatrasie*, the huddling together, that is to say, of a medley of language and images which is best known to English readers in the not always successful following of Sterne. It pleased him also to disguise his naturally terse, strong, and nervous style in a burlesque envelope of redundant language, which is partly ironical, partly the result of superfluous erudition, and partly that of a certain childish wantonness and exuberance, which is one of his raciest and pleasantest characteristics. In both these points he was somewhat corruptly followed. But fortunately the romancical writers of the 16th century had not Rabelais for their sole model, but were also influenced by the simple and straightforward style of the *Cent Nouvelles Nouvelles* and the *Histoire des Sept Sages*. The joint influence gives us some admirable work. Nicholas of Troyes, a saddler of Champagne, came too early to copy Rabelais. But Noel du Fail (1520–1591), a judge at Rennes, shows the double influence in his *Propos Rustiques* and *Contes d'Eutrapel*, both of which are lively and well-written pictures of contemporary life and thought, as the country magistrate actually saw and dealt with them. In 1558, however, appeared two works of far higher literary and social interest. These are the *Heptameron* of the queen of Navarre, and the *Contes et Joyeux Devis* of Bonaventure des Periers (1500–1544). Des Periers, who was a courtier of Marguerite's, is thought to have had a good deal to do with the first-named work as well as with the second. Indeed, not merely the queen's prose works, but also the poems gracefully entitled *Les Marguerites de la Marguerite*, are often attributed to the literary men whom the sister of Francis I. gathered round her. However this may be, some single influence of power enough to give unity and distinctness of savor evidently presided over the composition of the *Heptameron*. Composed as it is on the model of Boccaccio, its tone and character are entirely different, and few works have a more individual charm. The *Tales* of Des Periers are shorter, simpler, and more homely; there is more wit in them and less refinement. But both works breathe more powerfully perhaps than any others the peculiar mixture of cultured and poetical voluptuousness with a certain religiosity and a vigorous spirit of action which characterizes the French Renaissance, and distinguishes it equally from the effeminate languor and mere bookishness of the earlier Italian movement and the more serious, sterner, and almost uncouth characteristics of the later poetical outburst in England. Later in time, but too closely connected with Rabelais in form and spirit to be here omitted, came the *Moyen de Parvenir* of Béroalde de Verville (1550–1612), a singular *fatrasie*, uniting wit, wisdom, learning, and indecency, and crammed with anecdotes which are always amusing though rarely decorous.

Amadis of Gaul.

At the same time a fresh vogue was given to the chivalric romance by Herberay's translation of *Amadis de Gaula*. French writers, relying partly on tradition and partly on a general assumption that the romance of chivalry is essentially French in origin, have supposed a French original for the *Amadis* in some lost roman d'aventures. It is of course impossible to say that this is not the case, but there is not one tittle of evidence to show that it is, and there seems no reason to doubt the accepted statement that Vasco de Lobeira wrote a lost Portuguese original in the 14th century, which Garciordoñez de Montalvo adapted in Spanish a century later. Montalvo found many continuators, and the adventures of Amadis were prolonged through generation after generation of his descendants. This vast work Herberay in 1540 undertook to translate or re-translate, but it was not without the assistance of several followers that the task was completed. Southey has charged Herberay with corrupting the simplicity of the original, a charge which does not concern us here. It is sufficient to say that the French *Amadis* is an excellent piece of literary work, and that Herberay deserves no mean place among the fathers of French prose. His book had an immense popularity; it was translated into many foreign languages, and for some time it served as a favorite reading book for foreigners studying French. Nor is it to be doubted that the romancers of the Scudéry and Calprenède type in the next century were much more influenced both for good and harm by these Amadis romances than by any of the earlier tales of chivalry.

16th Century Historians.—As in the case of the tale-tellers so in that of the historians, the writers of the 16th century had traditions to continue. It is doubtful indeed whether many of them can risk comparison as artists with the great names of Villehardouin and Joinville, Froissart and Comines. The 16th century, however, set the example of dividing the functions of the chronicler, setting those of the historian proper on one side, and of the anecdote-monger and biographer on the other. The efforts at regular history made in this century were not of the highest value. But on the other hand the practice of memoir-writing, in which the French were to excel every nation in the world, and of literary correspondence, in which they were to excel even their memoirs, was solidly founded.

One of the earliest historical writers of the century was Claude de Seyssel (1450–1520), whose history of Louis XII. aims not unsuccessfully at style. But it is not till close upon the end of the century that much effort was made at methodical history. Only one work falls properly to be mentioned here, and that is Du Haillan's (1537–1610) *Histoire de France*, a history composed on Thucydidean principles, but Thucydidean principles transmitted through the successive mediums of Polybius, Guicciardini, and Paulus Æmilius. The instance invariably quoted after Thierry of Du Haillan's method is his introduction, with appropriate speeches of two Merovingian statesmen, who argue out the relative merits of monarchy and oligarchy on the occasion of the election of Pharamond. Besides Du Haillan, La Popelinière (fl. 1580), who less ambitiously attempted a history of Europe during his own time, and expended immense labor on the collection of information and materials, deserves mention.

Brantôme.

There is no such poverty of writers of memoirs. La Mark Du Bellay, Marguerite d'Angoulême, Villars, Tavannes, La Tour d'Auvergne, and many others, composed commentaries and autobiographies. Vincent Carloix (fl. 1550), the secretary of the Marshal de Vielleville, composed some memoirs abounding in detail and incident. But there are four collections of memoirs concerning this time which far exceed all others in interest and importance. The turbulent dispositions of the time, the loose dependence of the nobles and even the smaller gentry on any single or central authority, the rapid changes of political situations, and the singularly active appetite, both for pleasure and for business, for learning and for war, which distinguished the French gentleman of the 16th century, place the memoirs of Lanoue (1531–1591), Monluc (1503–1577), D'Aubigné, and Brantôme (1540–1614) almost at the head of the literature of their class. The name of the latter, indeed, is known to all who have the least tincture of French literature, and the works of the others are not inferior in interest, and perhaps superior in spirit and conception, to the *Dames Galantes*, the *Grands Capitaines*, and the *Hommes Illustres*. The commentaries of Monluc, which Henri Quatre is said to have called the soldier's Bible, are exclusively military, and deal with affairs only. Monluc was governor in Guienne, where he repressed the savage Huguenots of the south with a savagery worse than their own. He was, however, a partisan of order, not of Catholicism. He hung and shot both parties with perfect impartiality, and refused to have anything to do with the massacre of St. Bartholomew. Though he was a man of no learning, his style is excellent, being vivid, flexible, and straightforward. Lanoue, who was a moderate in politics, has left his principles reflected in his memoirs. D'Aubigné, so often to be mentioned, gives the extreme Huguenot side as opposed to the royalist partisanship of Monluc and the *via media* of Lanoue. Brantôme, on the other hand, is quite free from any political or religious prepossessions, and, indeed, troubles himself very little about any such matters. He is the shrewd and somewhat cynical observer, moving through the crowd and taking note of its ways, its outward appearance, its heroisms, and its follies. It is really difficult to say whether the recital of a noble deed of arms or the telling of a scandalous story about a court lady gave him the most pleasure, and impossible to say which he did best. Certainly he had ample material for both exercises in the history of his time.

The branches of literature of which we have just given an account may be fairly connected, from the historical point of view, with work of the same kind that went before as well as with work of the same kind that followed them. It was not so with the literature of theology, law, politics, and erudition, which the 16th century also produced, and with which it for the first time enlarged the range of composition in the vulgar tongue. Not only had Latin been invariably adopted as the language of composition on such subjects, but the style of the treatises dealing with such matters had been traditional rather than original. In speculative philosophy or metaphysics proper, even this century did not witness a great development; perhaps, indeed, such a development was not to be expected until the minds of men had in some degree settled down from their agitation on more practical matters. It is not without significance that Calvin (1509–1564) is the great figure in serious French prose in the first half of the century, Montaigne the corresponding figure in the second half. After Calvin and Montaigne we expect Descartes.

Calvin.

16th Century Theologians.—In France, as in all other countries, the Reformation was an essentially popular movement, though from special causes, such as the absence of political homogeneity, the nobles took a more active part both with pen and sword in it than was the case in England. But the great text-book of the French Reformation was not the work of any noble. Calvin's *Institution of the Christian Religion* is a book equally remarkable in matter and in form, in circumstances and in result. It is the first really great composition in argumentative French prose. Its severe logic and careful arrangement had as much influence on the manner of future thought, both in France and the other regions whither its widespread popularity carried it, as its style had on the expression of such thought. It was the work of a man of only seven-and-twenty, and it is impossible to exaggerate the originality of its manner when we remember that hardly any models of French prose then existed except tales and chronicles, which required and exhibited totally different qualities of style. It is indeed probable that had not the *Institution* been first written by its author in Latin, and afterwards translated by him, it might have had less dignity and vigor; but it must at the same time be remembered that this process of composition was at least equally likely in the hands of any but a great genius to produce a heavy and pedantic style neither French nor Latin in character. Something like this result was actually produced in some of Calvin's minor works, and still more in the works of many of his followers, whose lumbering language gained for itself, in allusion to their exile from France, the title of "style refugié." Nevertheless, the use of the vulgar tongue on the Protestant side, and the possession of a work of such importance written therein, gave the Reformers an immense advantage which their adversaries were some time in neutralizing. Calvin was much helped by Pierre Viret (1511–

1571), who wrote a large number of small theological and moral dialogues, and of satirical pamphlets, destined to captivate as well as to instruct the lower people. The more famous Beza (1519–1605) wrote chiefly in Latin, but he composed in French an ecclesiastical history of the Reformed churches and some translations of the Psalms. Marnix de St. Aldegonde (1530–1593), a gentleman of Brabant, followed Viret as a satirical pamphleteer on the Protestant side. On the other hand, the Catholic champions at first affected to disdain the use of the vulgar tongue, and their pamphleteers, when they did attempt it, were unequal to the task. Towards the end of the century a more decent war was waged with Du Plessis Mornay (1549–1623) on the Protestant side, whose work is at least as much directed against freethinkers and enemies of Christianity in general as against the dogmas and discipline of Rome. His adversary, the redoubtable Cardinal du Perron (1556–1618), who, originally a Calvinist, went over to the other side, employed French most vigorously in controversial works, chiefly with reference to the eucharist. Du Perron was celebrated as the first controversialist of the time, and obtained dialectical victories over all comers. At the same time the bishop of Geneva, St. Francis of Sales (1568–1622), supported the Catholic side, partly by controversial works, but still more by his devotional writings. The *Introduction to a Devout Life*, which, though actually published early in the next century, had been written some time previously, shares with Calvin's *Institution* the position of the most important theological work of the period, and is in remarkable contrast with it in style and sentiment as well as in principles and plan. It has indeed been accused of a certain effeminacy, the appearance of which is in all probability mainly due to this very contrast. The 16th century does not, like the 17th, distinguish itself by literary exercises in the pulpit. The furious preachers of the League, and their equally violent opponents, have no literary value.

Montaigne.

16th Century Moralists and Political Writers.—The religious dissensions and political disturbances of the time could not fail to exert an influence on ethical and philosophical thought. Yet, as we have said, the century was not prolific of pure philosophical speculation. The scholastic tradition, though long sterile, still survived, and with it the habit of composing in Latin all works in any way connected with philosophy. The logic of Ramus in 1555 is cited as the first departure from this rule. Other philosophical works are few, and chiefly express the doubt and the freethinking which were characteristic of the time. This doubt assumes the form of positive religious scepticism only in the *Cymbalum Mundi* of Bonaventure des Periers, a remarkable series of dialogues which excited a great storm, and ultimately drove the author to commit suicide. The *Cymbalum Mundi* is a curious anticipation of the 18th century. The literature of doubt, however, was to receive its principal accession in the famous essays of Montaigne (1533–1592). It would be a mistake to imagine the existence of any sceptical propaganda in this charming and popular book. Its principle is not scepticism but egotism; and as the author was profoundly sceptical, this quality necessarily rather than intentionally appears. We have here to deal only very superficially with this as with other famous books, but it cannot be doubted that it expresses the mental attitude of the latter part of the century as completely as Rabelais expresses the mental attitude of the early part. There is considerably less vigor and life in this attitude. Inquiry and protest have given way to a placid conviction that there is not much to be found out, and that it does not much matter; the erudition though abundant is less indiscriminate, and is taken in and given out with less gusto; exuberant drollery has given way to quiet irony; and though neither business nor pleasure is decried, they are regarded rather as useful pastimes incident to the life of man than with the eager appetite of the Renaissance. From the purely literary point of view, the style is remarkable from its absence of pedantry in construction, and yet for its rich vocabulary and picturesque brilliancy. The follower and imitator of Montaigne, Pierre Charron (1541–1603), carried his master's scepticism to a somewhat more positive degree. His principal book, *De la Sagesse*, scarcely deserves the comparative praise which Pope has given it. On the other hand Du Vair (1556–1621), a lawyer and orator, takes the positive rather than the negative side in morality, and regards the vicissitudes in human affairs from the religious and teleological point of view in a series of works written in a style less diffuse than that of Montaigne, and characterized by the special merits which the style of great orators often though not always has when they betake themselves to literary composition.

The revolutionary and innovating instinct which showed itself in the 16th century with reference to church government and doctrine, and even in some respects with regard to religious principles generally, spread naturally enough to political matters. The intolerable misgovernment which prevailed during the greater part of the century in France in consequence of religious dissensions, naturally set the thinkers of the age speculating on the doctrines of government in general. The favorite and general study of antiquity helped this tendency, and the great accession of royal power in all the monarchies of Europe invited a speculative if not a practical reaction. The persecutions of the Protestants naturally provoked a republican spirit among them, and the violent antipathy of the League to the houses of Valois and Bourbon made its partisans adopt almost openly the principles of democracy and tyrannicide.

Bodin.

The greatest political writer of the age is Jean Bodin (1550–1596), whose *République* is founded partly on speculative considerations like the political theories of the ancients, and partly on an extended historical inquiry. Bodin, like most lawyers who have taken the royalist side, is for unlimited monarchy, but notwithstanding this, he condemns religious persecution and discourages slavery. In his speculations on the connection between forms of government and natural causes, he serves as a link between Aristotle and Montesquieu. On the other hand, the causes which we have mentioned made a large number of writers adopt opposite conclusions. Étienne de la Boétie (1530–1563), the friend of Montaigne's youth, composed the *Contre Un* or *Discours de la Servitude Volontaire*, a protest against the monarchical theory. The boldness of the protest and the affectionate admiration of Montaigne, have given La Boétie a much higher reputation than any extant work of his actually deserves. The *Contre Un* is a kind of prize essay, full of empty declamation borrowed from the ancients, and showing no grasp of the practical conditions of politics. Not much more historically based, but far more vigorous and original, is the *Franco-Gallia* of Hotmann, a work which appeared both in Latin and French, which extols the authority of the states-general, and represents them as direct successors of the political institutions of Gauls and Franks. In the last quarter of the century political animosity knew no bounds. The Protestants beheld a divine instrument in Poltrot de Méré, the Catholics in Jacques Clément. The Latin treatises of Languet and Buchanan formally vindicated the first the right of rebellion, the second the right of tyrannicide. Indeed, as Montaigne confesses, divine authorization for political violence was claimed and denied by both parties according as the possession or the expectancy of power belonged to each, and the excesses of the preachers and pamphleteers knew no bounds.

Satire Menippée.

Every one, however, was not carried away. The literary merits of the Chancellor l'Hôpital (1503–1575) are not very great, but his efforts to promote peace and moderation were unceasing. On the other side Lanoue, with far greater literary gifts, pursued the same ends, and pointed out the ruinous consequences of continued dissension. Du Plessis Mornay took a part in political discussion even more important than that which he bore in religious polemics, and was of the utmost service to Henri Quatre in defending his cause against the League, as was also Hurault, another author of state papers. Du Vair, already mentioned, powerfully assisted the same cause by his successful defence of the Salic law, the disregard of which by the Leaguer states-general was intended to lead to the admission of the Spanish claim to the crown. But the foremost work against the League was the famous *Satire Menippée*, in a literary point of view one of the most remarkable of political works. The *Menippée* was the work of no single author, but was due, it is said, to the collaboration of five, Leroi, Gillot, Chrétien, Rapin, and Pithou, with some assistance in verse from Passerat. The book is a kind of burlesque report of the meeting of the states-general, called for the purpose of supporting the views of the League in 1593. It gives an account of the procession of opening, and then we have the supposed speeches of the principal characters,—the Duc de Mayenne, the papal legate, the rector of the university (a ferocious Leaguer), and others. But by far the most remarkable is that attributed to Claude d'Aubray, the leader of the *Tiers État*, in which all the evils of the time and the malpractices of the leaders of the League are exposed and branded. The satire is extraordinarily bitter and yet perfectly good-humored. It resembles in character rather that of Butler, who unquestionably imitated it, than any other. The style is perfectly suited to the purpose, having got rid of almost all vestiges of the cumbrousness of the older tongue without losing its picturesque quaintness. It is no wonder that, as we are told by contemporaries, it did more for Henri Quatre than all other writings in his cause. In connection with politics some mention of legal orators and writers may be necessary. In 1539 the ordinance of Villers-Cotterets enjoined the exclusive use of the French language in legal procedure. The bar and bench of France during the century produced, however, besides those names already mentioned in other connections, only one deserving of special notice, that of Étienne Pasquier, author of a celebrated speech against the right of the Jesuits to take part in public teaching. This he inserted in his great work, *Recherches de la France*, a work dealing with almost every aspect of French history whether political, antiquarian, or literary.

16th Century Savants.—One more division, and only one, that of scientific and learned writers pure and simple, remains. Much of the work of this kind during the period was naturally done in Latin, the vulgar tongue of the learned. But in France, as in other countries, the study of the classics led to a vast number of translations, and it so happened that one of the translators deserves as a prose writer a rank among the highest. Many of the authors already mentioned contributed to the literature of translation. Des Periers translated the Platonic dialogue *Lysis*, La Boétie some works of Xenophon and Plutarch, Du Vair the *De Corona*, the *In Ctesiphontem*, and the *Pro Milone*. Salel attempted the *Iliad*, Belleau the false *Anacreon*, Baif some plays of Plautus and Terence. Besides these Lefevre gave a version of the Bible, Saliat one of Herodotus, and Louis Leroi, not to be confounded with the part author of the Menippée, many works of Plato, Aristotle, and other Greek writers. But while most if not all of these translators owed the merits of their work to their originals, and deserved, much more deserve, to be read only by those to whom those originals are sealed, Jacques Amyot (1513–1591), bishop of Auxerre, takes rank as a French classic by his translations of Plutarch, Longus, and Heliodorus. The admiration which Amyot excited in his own time was immense. Montaigne declares that it was thanks to him that his contemporaries knew how to speak and to write, and the Academy in the next age, though not too much inclined to honor its predecessors, ranked him as a model. His Plutarch, which had an enormous influence at the time, and colored perhaps more than any classic the thoughts and writings of the 16th century, both in French and English, was then considered his masterpiece. Now-a-days perhaps, and from the purely literary standpoint, that position would be assigned to his exquisite version of the exquisite story of Daphnis and Chloe. It is needless to say that absolute fidelity and exact scholarship are not the pre-eminent merits of these versions. They are not philological exercises, but works of art. We have already had occasion to mention Jean le Maire des Belges. His *Illustrations des Gaules* is an antiquarian rather than an historical work, which assembles or invents a mass of fables about the origin of Franks and Gauls, and a group of antiquarian writers of the history of different provinces followed his lead. On the other hand, Claude Fauchet, in two antiquarian works *Antiquités Gauloises et Françoises* and *L'Origine de la Langue et de la Poésie Française*, displays a remarkable critical faculty in sweeping away these fables. Fauchet had the (for his time) wonderful habit of consulting manuscripts, and we owe to him literary notices of many of the trouvères. At the same time La Croix du Maine and Duverdier founded the study of bibliography in France. Pasquier's *Recherches*, already alluded to, carries out the principles of Fauchet independently, and besides treating the history of the past in a true critical spirit, supplies us with voluminous and invaluable information on contemporary politics and literature. He has, moreover, the merit which Fauchet had not, of being an excellent writer. Henri Étienne also deserves notice in this place, both for certain treatises on the French language, full of critical crotchets, and also for his curious *Apologie pour Hérodote*, a remarkable book not particularly easy to class. It consists partly of a defence of its nominal subject, partly of satirical polemics on the Protestant side, and is filled almost equally with erudition and with the buffoonery and *fatrasie* of the time. The book, indeed, was much too Rabelaisian to suit the tastes of those in whose defence it was composed.

Amyot.

The 16th century is somewhat too early for us to speak of science, and such science as was then composed falls for the most part outside French literature. The famous potter, Palissy (1510–1589), however, was not much less skilful as a fashioner of words than as a fashioner of pots, and his description of the difficulties of his experiments in enamelling, which lasted sixteen years, is well known. The great surgeon Ambrose Paré (1510–1590) was also a writer, and his descriptions of his military experiences at Turin, Metz, and elsewhere have all the charm of the 16th century memoir. The only other writer who requires special mention is Olivier de Serres (1539-1619), an author who treated on agriculture, and composed, under the title of *Théâtre d'Agriculture*, a complete treatise on the various operations of rural economy, which became extremely popular, and was frequently reprinted up to the present century.

17th Century Poetry.—It is not always easy or possible to make the end or the beginning of a literary epoch synchronize exactly with historical dates. It happens, however, that for once the beginning of the 17th century coincides almost exactly with an entire revolution in French literature. The change of direction and of critical standard given by Malherbe (1556–1628) to poetry was to last for two whole centuries, and to determine, not merely the language and complexion, but also the form of French verse during the whole of that time. Accidentally, or as a matter of logical consequence (it would not be proper here to attempt to decide the question), poetry became almost synonymous with drama. It is true, as we shall have to point out, that there were, in the early part of the 17th century at least, poets, properly so called, of no contemptible merit. But their merit, in itself respectable, sank in comparison with the far greater merit of their dramatic rivals. Théophile de Viau and Racan, Voiture and St. Amand, cannot for a moment be mentioned in the same rank with Rotrou, still less with Corneille. It is certainly curious, if it is not something more than curious, that this decline in poetry proper should have coincided with the so-called reforms of Malherbe. The tradition of respect for this elder and more gifted Boileau was at one time all-powerful in France, and, notwithstanding the romantic movement, is still strong. In rejecting a large number of the importations of the Ronsardists, he certainly did good service. But it is difficult to avoid ascribing in great measure to his influence the origin of the chief faults of modern French poetry, and modern French in general, as compared with the older language. Like Pope, he sacrified everything to "correctness," and, unluckily for French, the sacrifice was made at a time when no writer of an absolutely supreme order had yet appeared in the language. With Shakespeare and Milton, not to mention scores of writers only inferior to them, safely garnered, Pope and his followers could do us little harm. Corneille and Molière unfortunately came after Malherbe. Yet it would be unfair to this writer, however badly we may think of his influence, to deny him talent, and even a certain amount of poetical inspiration. He had not felt his own influence, and the very influences which he despised and proscribed produced in him much tolerable and some admirable verse, though he is not to be named as a poet with Regnier, who had the courage, the sense, and the good taste to oppose and ridicule his innovations. Of Malherbe's school which was numerous, Racan (1589–1670) and Maynard (1582–1646) were the most remarkable. The former was a true poet, though not a very strong one. Like his master, he is best when he follows the models whom that master contemned. Perhaps more than any other poet, he set the example of the classical alexandrine, the smooth and melodious but monotonous and rather effeminate measure which Racine was to bring to the highest perfection, and which his successors, while they could not improve its smoothness, were to make more and more monotonous until the genius of Victor Hugo once more broke up its facile polish, suppled its stiff uniformity, and introduced vigor, variety, color, and distinctness in the place of its feeble-

Malherbe.

sameness and its pale indecision. But the vigor, not to say the license, of the 16th century could not thus die all at once. In Théophile de Viau (1590–1626) the early years of the 17th century had their Villon. The later poet was almost as unfortunate as the earlier, and almost as disreputable, but he had a great share of poetical power. The *étoile enragée* under which he complains that he was born, was at least kind to him in this respect; and his readers, after he had been forgotten for two centuries, have once more done him justice. Racan and Théophile were followed in the second quarter of the century by two schools which sufficiently well represented the tendencies of each. The first was that of Voiture (1598–1648), Benserade (1612–1691), and other poets who were connected more or less with the famous literary coterie of the Hôtel de Rambouillet. Théophile was less worthily succeeded by a class, it can hardly be called a school, of poets, some of whom, like St. Amand (1594–1660), chiefly wrote drinking songs and such like productions; others, like Scarron (1610–1660) and Sarrasin (1603–1654), devoted themselves rather to burlesque of serious verse. Most of the great dramatic authors of the time also wrote miscellaneous poetry, and there was even an epic school of the most singular kind, in ridiculing and discrediting which Boileau for once did undoubtedly good service. The *Pucelle* of Chapelain (1595–1674), the unfortunate author who was deliberately trained and educated for a poet, who enjoyed for some time a sort of dictatorship in French literature on the strength of his forthcoming work, and at whom from the day of its publication every critic of French literature has agreed to laugh, was the most famous and perhaps the worst of these. But Scudéry (1601–1667) wrote an *Alaric*, the Père le Moyne (1602–1671) a *St. Louis*, and St. Amand a *Moïse*, which are not much better, though Théophile Gautier in his *Grotesques* has valiantly defended these and other contemporary versifiers. St. Amand, indeed, was capable of writing excellent poetry in other styles, and not seldom actually produced such. Some of the lighter poets and classes of poetry just alluded to also produced some remarkable verse. The Précieuses of the Hôtel Rambouillet, with all their absurdities, encouraged if they did not produce good literary work. In their society there is no doubt that a great reformation of manners took place, if not of morals, and that the tendency to literature elegant and polished, yet not destitute of vigor, which marks the 17th century, was largely developed side by side with much scandalmongering and anecdotage. Many of the authors whom these influences inspired, such as Voiture, St. Evremond, and others, have been or will be noticed. But even such poets and wits as Sénecé (1643–1737), Segrais (1624–1701), Charleval, Godeau (1605–1672), Gombaud (1570–1666), are not without interest in the history of literature; while if Cotin (1604–1682) sinks below this level, Ménage (1630–1692) certainly rises above it, notwithstanding Molière's satire. Ménage's name naturally suggests the *Ana* which arose at this time and were long fashionable, stores of endless gossip, sometimes providing instruction and often amusement. The *Guirlande de Julie*, in which most of the poets of the time celebrated Julie d'Angennes, daughter of the Marquise, is perhaps the best of all such albums, and Voiture, the typical poet of the coterie, was certainly the best writer of *vers de société* who is known to us. The poetical war which arose between the Uranistes, the followers of Voiture, and the Jobistes, those of Benserade, produced reams of sonnets, epigrams, and similar verses. This habit of occasional versification continued long. It led as a less important consequence to the rhymed *Gazettes* of Loret, which recount in octosyllabic verse of a light and lively kind the festivals and court events of the early years of Louis XIV. It led also to perhaps the most remarkable non-dramatic poetry of the century, the *Contes* and *Fables* of La Fontaine (1621–1695). No French writer is better known than La Fontaine, and there is no need to dilate on his merits. It has been well said that he completes Molière, and that the two together give something to French literature which no other literature possesses. Yet La Fontaine is after all only a writer of fabliaux, in the language and with the manners of his own century.

Boileau.

All the writers we have mentioned belong more or less to the first half of the century, and so do Conrart, Furetière, Chapelle, Desmarets, and others not worth special mention. The latter half of the century is far less productive, and the poetical quality of its production is even lower than the quantity. In it Boileau (1636–1711) is the chief poetical figure. Next to him can only be mentioned Madame Deshoulières (1638–1694), Brébeuf, the translator of Lucan, Quinault (1655–1688), the composer of opera libretti. It is almost impossible to call either of these writers poets, with the doubtful exception of Quinault. The denunciation of Boileau as a versifier whose best verses are those of a promising sixth-form boy, and his worst those of an unpromising boy in the third form, is not epigram or exaggeration. His satire, where it has much merit, is usually borrowed direct from Horace. He had a certain faculty as a critic of the slashing order, and might have profitably used it if he had written in prose. But of his poetry it must be said, not so much that it is bad, as that it is not poetry at all, and the same is generally true of all those who followed him, with the possible exception of J. B. Rousseau, from Chaulieu (1639–1720) and La Fare (1644–1712) to Delille (1738–1813) and Le Brun (1729–1807).

Hardy.

Rotrou.

17th Century Drama.—We have already seen how the mediæval theatre was formed, and how in the second half of the 16th century it met with a formidable rival in the classical drama of Jodelle and Garnier. In 1588 mysteries had been prohibited, and with the prohibition of the mysteries the Confraternity of the Passion lost the principal part of its reason for existence. The other bodies and societies of amateur actors had already perished, and at length the Hôtel de Bourgogne itself, the home of the confraternity, had been handed over to a regular troop of actors, while companies of strollers, whose life has been vividly depicted in the *Roman Comique* of Scarron and the *Capitaine Fracasse* of Théophile Gautier, wandered all about the provinces. The old farce was for a time maintained or revived by Tabarin, a remarkable figure in dramatic history, of whom but little is known. The great dramatic author of the first quarter of the 17th century was Alexandre Hardy (1560–1631), who surpassed even Heywood in fecundity, and very nearly approached the portentous productiveness of Lope de Vega. Seven hundred is put down as the modest total of Hardy's pieces, but not much more than a twentieth of these exist in print. From these latter we can judge Hardy. They are hardly up to the level of the worst specimens of the contemporary Elizabethan theatre, to which, however, they bear a certain resemblance. Marston's *Insatiate Countess* and the worst parts of Chapman's *Bussy d'Ambois* may give English readers some notion of them. Yet Hardy was not totally devoid of merit. He imitated and adapted Spanish literature, which was at this time to France what Italian was in the century before and English in the century after, in the most indiscriminate manner. But he had a considerable command of grandiloquent and melodramatic expression, a sound theory if not a sound practice of tragic writing, and that peculiar knowledge of theatrical art and of the taste of the theatrical public which since his time has been the special possession of the French playwright. It is instructive to compare the influence of his irregular and faulty genius with that of the regular and precise Malherbe. From Hardy to Rotrou is, in point of literary interest, a great step, and from Rotrou to Corneille a greater. Yet the theory of Hardy only wanted the genius of Rotrou and Corneille to produce the latter. Rotrou (1609–1650) has been called the French Marlowe, and there is a curious likeness and yet a curious contrast between the two poets. The best parts of Rotrou's two best plays, *Venceslas* and of *Genest*, are quite beyond comparison in respect of anything that preceded them, and the central speech of the last-named play will rank with anything in French dramatic poetry. We must, despite the necessity of excluding personal details from this article, add that the noble personal character of this little known French dramatist, his generous acknowledgment of Corneille, who succeeded and surpassed him, and the devotion with which he sacrificed his life to his official duty, are almost as admirable as his works. Contemporary with Rotrou were other dramatic writers of considerable dramatic importance, most of them distinguished by the faults of the Spanish school, its declamatory rhodomontade, its conceits, and its occasionally preposterous action. Jean de Schélandre (d. 1635) has left us a remarkable work in *Tyr et Sidon*. Théophile de Viau in *Pyrame et Thisbé* and in *Pasiphaé* produced a singular mixture of the classicism of Garnier and the extravagances of Hardy. Scudéry in *L'Amour Tyrannique* and other plays achieved a considerable success. The *Marianne* of Tristan (1601–1655) and the *Sophonisbe* of Mairet (1604–1688) are the chief pieces of their authors. Mairet resembles Marston in something more than his choice of subject. Another dramatic writer of some eminence is Du Ryer (1605–1648). But the fertility of France at this moment in dramatic authors was immense; nearly 100 are enumerated in the first quarter of the century. **Corneille.** The early plays of Corneille (1606–1684) showed all the faults of his contemporaries combined with merits to which none of them except Rotrou, and Rotrou himself only in part, could lay claim. His first play was *Mélite*, a comedy, and in *Clitandre*, a tragedy, he soon produced what may perhaps be not inconveniently taken as the typical piece of the school of Hardy. A full account of Corneille may be found elsewhere. It is sufficient to say here that his importance in French literature is quite as great in the way of influence and example as in the way of intellectual excellence. The *Cid* and the *Menteur* are respectively the first examples of French tragedy and comedy which can be called modern. But this influence and example did not at first find many imitators. Corneille was a member of Richelieu's band of five poets. Of the other four Rotrou alone deserves the title; the remaining three, Boisrobert, Colletet, and Lestoile, are as dramatists worthy of no notice, nor were they soon followed by others more worthy. Yet before many years had passed the examples which Corneille had set in tragedy and in comedy were followed up by unquestionably the greatest comic writer, and by one who long held the position of the greatest tragic writer of France. **Molière.** Beginning with mere farces of the Italian type, and passing from these to comedies still of an Italian character, it was in *Les Précieuses Ridicules*, acted in 1659, that Molière (1622-1673), in the words of a spectator, hit at last on "la bonne comédie." The next fifteen years comprise the whole of his best known work, the finest expression beyond doubt of a certain class of comedy that any literature has produced. **Racine.** The tragic masterpieces of Racine (1639–1699) were not far from coinciding with the comic masterpieces of Molière, for with the exception of the remarkable aftergrowth of *Esther* and *Athalie*, they were produced chiefly between 1667 and 1677. Both Racine and Molière fall into the class of writers who require separate mention. Here we can only remark that both to a certain extent committed, and, which is still more to our purpose, set the example of a fault which distinguished much subsequent French dramatic literature. This was the too great individualizing of one point in a character, and the making the man or woman nothing but a blunderer, a lover, a coxcomb, a tyrant, and the like. The very titles of French plays show this influence,—they are "Le Grondeur," "Le Joueur," etc. The complexity of human character is ignored. This fault distinguishes both Molière and Racine from writers of the very highest order; and in especial it distinguishes the comedy of Molière and the tragedy of Racine from the comedy and tragedy of Shakespeare. In all probability this and other defects of the French drama, which are not wholly apparent in the work of Molière and Corneille, are shown in their most favorable light in those of Racine, and appear in all their deformity in the successors of the latter, arise from the rigid adoption of the Aristotelian theory of the drama with its unities and other restrictions, especially as transmitted by Horace through Boileau. **The Academy.** This adoption was very much due to the influence of the French Academy, which was founded in 1629, and which continued the tradition of Malherbe in attempting constantly to school and correct, as the phrase went, the somewhat disorderly instincts of the early French stage. It is difficult to say whether the subordination of all other classes of composition to the drama which has ever since been characteristic of French literature was or was not due to the predilection of Richelieu, the main protector, if not exactly the founder of the Academy, for the theatre. Among the immediate successors and later contemporaries of the three great dramatists we do not find any who deserve high rank as tragedians, though there are some whose comedies are more than respectable. It is at least significant that the restrictions imposed by the academic theory on the comic drama were far less severe than those which tragedy had to undergo. The latter was practically confined in respect of sources of attraction to the dexterous manipulation of the unities; the interest of a plot attenuated as much as possible, and intended to produce, instead of pity a mild sympathy, and instead of terror a mild alarm (for the purists decided against Corneille that "admiration was not a tragic passion"); and lastly the composition of long tirades of smooth but monotonous verses arranged in couplets tipped with delicately careful rhymes. Only Thomas Corneille (1625–1706), the inheritor of an elder tradition and of a great name, deserves to be excepted from the condemnation to be passed on the lesser tragedians of this period. He was unfortunate in possessing his brother's name, and in being, like him, too voluminous in his compositions; but *Camma, Ariane, Le Comte d'Essex*, are not tragedies to be despised. On the other hand the names of Campistron (1656–1737) and Pradon (1632–1698) only serve to point injurious comparisons; Duché (1660–1704) and La Fosse (1653–1708) are of still less importance, and Quinault's tragedies are chiefly remarkable because he had the good sense to give up writing them and to take to opera. The general excellence of French comedy, on the other hand, was sufficiently vindicated. Besides the splendid sum of Molière's work, the two great tragedians had each, in *Le Menteur* and *Les Plaideurs*, set a capital example to their successors, which was fairly followed. Brueys (1640–1723) and Palaprat (1650–1721) brought out once more the ever new *Advocat Patelin*. Quinault and Campistron wrote fair comedies. Dancourt (1661–1726), Dufresny (1684–1721), Boursault (1638–1701), were all comic writers of considerable merit. But the chief comic dramatist of the latter period of the 17th century was Regnard (1655–1709), whose *Joueur* and *Légataire* are comedies almost of the first rank.

17th Century Fiction.—In the department of literature which comes between poetry and prose, that of romance writing, the 17th century, excepting one remarkable development, was not very fertile. It devoted itself to so many new or changed forms of literature that it had no time to anticipate the modern novel. **Heroic romances.** Yet at the beginning of the century one very curious form of romance writing was diligently cultivated, and its popularity, for the time immense, perhaps prevented the introduction of any stronger style, to which at the same time the poetical trifles of the literary coteries, the memoirs of the Fronde, and the dramas of the epoch of Louis XIV. were unfavorable. It is perhaps curious that, as the first quarter of the 17th century was preeminently the epoch of Spanish influence in France, the distinctive satire of Cervantes should have been less imitated than the models which Cervantes satirized. However this may be, the romances of 1600 to 1650 form a class of literature vast, isolated, and, perhaps of all such classes of literature, most utterly obsolete and extinct. Taste, affectation, or antiquarian diligence has, at one time or another, restored to a just, and sometimes a more than just, measure of reputation most of the literary relics of the past. Romances of chivalry, fabliaux, early drama, Provençal poetry, prose chronicles, have all had, and deservedly, their rehabilitators. But *Polexandre* and *Cléopatre*, *Clélie* and the *Grand Cyrus*, have been too heavy for all the industry and energy of literary antiquarians. As we have already hinted, the nearest ancestry which can be found for them is the romances of the *Amadis* type. But the *Amadis*, and in a less degree its followers, although long, are long in virtue of incident. The romances of the *Clélie* type are long in virtue of interminable discourse, moralizing, and description. Their manner is not unlike that of the *Arcadia* and the *Euphues* which preceded them in England; and they express in point of style the tendency which simultaneously manifested itself all over Europe at this period, and whose chief exponents were Gongora in Spain, Marini in Italy, and Lyly in England. Everybody knows the *Carte de Tendre* which originally appeared in *Clélie*, and most people have heard of the shepherds and shepherdesses who figure in the *Astrée* of D'Urfé (1567–1625), on the borders of the Lignon; but here general knowledge ends, and there is perhaps no reason why it should go much further. It is sufficient to say that Mademoiselle de Scudéry (1607–1701) principally devotes herself to laborious gallantry and heroism, La Calprénède (1610–1663) to something which might have been the historical novel if it had been constructed on a less preposterous scale, and Gomberville (1600–1647) to moralizings and theological discussions on Jansenist principles. In the latter part of the century, the example of La Fontaine, though he himself wrote in poetry, helped to recall the tale-tellers of France to an occupation more worthy of them, more suitable to the genius of the literature, and more likely to last. The reaction against the *Clélie* school produced first Madame de Villedieu (Catherine Desjardins) (1631–1683), a fluent and facile novelist, who enjoyed great but not enduring popularity. The form which the prose tale took at this period was that of the fairy story. Perrault (1628–1703) and Madame d'Aulnoy (d. 1705) composed specimens of this kind which have never ceased to be popular since. Hamilton (1646–1720), the author of the well-known *Mémoires de Grammont*, wrote similar stories of extraordinary merit in style and ingenuity. There is yet a third class of prose writing which deserves to be mentioned. It also may probably be traced to Spanish influence, that is to say, to the picaroon romances which the 16th and 17th centuries produced in Spain in large numbers. The most remarkable example of this is the *Roman Comique* of the burlesque writer Scarron. The *Roman Bourgeois* of Furetière also deserves mention as a collection of pictures of the life of the time, arranged in the most desultory manner, but drawn with great vividness, observation, and skill. A remarkable writer who had great influence on Molière, has also to be mentioned in this connection rather than in any other. This is Cyrano de Bergerac (1620–1655), who, besides composing doubtful comedies and tragedies, writing political pamphlets, and exercising the task of literary criticism in objecting to Scarron's burlesques, produced *Voyages à la Lune et au Soleil*, half romantic and half satirical compositions, in which some have seen the original of *Gulliver's Travels*, in which others have discovered only a not very successful imitation of Rabelais, and which, without attempting to decide these questions, may fairly be ranked in the same class of fiction with the masterpieces of Swift and Rabelais, though of course at an immense distance below them. One other work, and in literary influence perhaps the most remarkable of its kind in the century, remains. Madame de Lafayette, the friend of La Rochefoucauld and of Madame de Sévigné, though she did not exactly anticipate the modern novel, showed the way to it in her stories, the principal of which are *Zaïde* and still more *La Princesse de Clèves*. The latter, though a long way from *Manon Lescaut*, *Clarissa*, or *Tom Jones*, is a longer way still from *Polexandre* or the *Arcadia*. The novel becomes in it no longer a more or less fictitious chronicle, but an attempt at least at the display of character. *La Princesse de Clèves* has never been one of the works widely popular out of their own country, nor perhaps does it deserve such popularity, for it has more grace than strength; but as an original effort in an important direction its historical value is considerable. But with this exception, the art of fictitious prose composition, except on a small scale, is certainly not one in which the century excelled, nor are any of the masterpieces which it produced to be ranked in this class.

Balzac and modern French prose.

17th Century Prose.—If, however, this was the case, it cannot be said that French prose as a whole was unproductive at this time. On the contrary, it was now, and only now, that it attained the strength and perfection for which it has been so long renowned, and which has perhaps, by a curious process of compensation, somewhat deteriorated since the restoration of poetry proper in France. The prose Malherbe of French literature was Balzac (1594–1654). The writers of the 17th century had practically created the literary language of prose, but they had not created a prose style. The charm of Rabelais, of Amyot, of Montaigne, and of the numerous writers of tales and memoirs whom we have noticed, was a charm of exuberance, of naïveté, of picturesque effect,—in short, of a mixture of poetry and prose, rather than of prose proper. Sixteenth century French prose is a delightful instrument in the hands of men and women of genius, but in the hands of those who have not genius it is full of defects, and indeed is nearly unreadable. Now, prose is essentially an instrument of all work. The poet who has not genius had better not write at all; the prose writer often may and sometimes must dispense with this qualification. He has need, therefore, of a suitable machine to help him to perform his task, and this machine it is the glory of Balzac to have done more than any other person to create. He produced himself no great work, his principal writings being letters, a few discourses and dissertations, and a work entitled *Le Socrate Chrétien*, a sort of treatise on political theology. But if the matter of his work is not of the first importance, its manner is of a very different value. Instead of the endless diffuseness of the preceding century, its ill-formed or rather unformed sentences, and its haphazard periods, we find clauses, sentences, and paragraphs distinctly planned, shaped, and balanced, a cadence introduced which is rhythmical but not metrical, and, in short, prose which is written knowingly instead of the prose which is unwittingly talked. It has been well said of him that he "écrit pour écrire;" and such a man, it is evident, if he does nothing else, sets a valuable example to those who write because they have something to say. He has time which they have not to make technical discoveries in his art, and his technical discoveries are in turn at their service, while they are almost compelled to make use of them by the appetite for such refinements which his works have created in the public. Voiture seconded Balzac without much intending to do so. His prose style, also chiefly contained in letters, is lighter than that of his contemporary, and helped to gain for French prose the tradition of vivacity and sparkle which it has always possessed, as well as that of correctness and grace.

17th Century History.—In historical composition, especially in the department of memoirs, this period was exceedingly rich, yet the first and perhaps the greatest of its historical works was not composed in French. The *Thuana*, or history of De Thou, was written in Latin, and only translated into French more than a century after its author's death. But, also at the beginning of the century, another writer composed on a larger plan an entire history of France. This was Mézeray (1610–1685), whose work, though not exhibiting the perfection of style at which some of his contemporaries had already arrived, and though still more or less uncritical, yet deserves the title of history. The example of Mézeray and De Thou was followed by a large number of writers, some of extended works, some of histories in part. Mézeray himself is said to have had a considerable share in the *Histoire du Roi Henri le Grand* by the Archbishop Péréfixe (1605–1670); Maimbourg wrote histories of the Crusades and of the League; Pellisson (1624–1693) gave a history of Louis XIV. Still later in the century, or at the beginning of the next, many lengthy historical works were composed. The Père d'Orléans (1644–1698) wrote a history of the revolutions of England, the Père Daniel (1649–1728), like d'Orléans a Jesuit, composed a lengthy history of France and a shorter one on the French military forces. Finally, at the end of the period, comes the great ecclesiastical history of Fleury (1640–1723), a work which perhaps belongs more to the section of erudition than to that of history proper. Three small treatises, however, composed by different authors towards the middle part of the century, supply remarkable instances of prose style in its application to history. These are the *Conjurations du Comte de Fiesque*, written by the famous Cardinal de Retz (1614–1679), the *Conspiration de Walstein* of Sarrasin, and the *Conjuration des Espagnols contre Venise*, composed in 1672 by the Abbé de St. Réal, the author of various historical and critical works deserving less notice. These three works, whose similarity of subject and successive composition at short intervals leave little doubt that a certain amount of intentional rivalry animated the two later authors, are among the earliest and best examples of the monographs for which French, in point of grace of style and lucidity of exposition, has long been the most successful vehicle of expression among European languages. Among other writers of history, as distinguished from memoirs, need only be noticed Agrippa d'Aubigné, whose *Histoire Universelle* closed his long and varied list of works, and Varillas (1624–1696), an historian chiefly remarkable for his extreme untrustworthiness. In point of memoirs and correspondence the period is hardly less fruitful than that which preceded it. The *Régistres-Journaux* of Pierre de l'Étoile (1540–1611), only now being published as a whole, consist of a diary something of the Pepys character, kept for nearly forty years by a person in high official employment. The memoirs of Sully (1560–1641), published under a curious title too long to quote, date also from this time, as do the *Letters* of Cardinal d'Ossat (1536–1604), much and deservedly praised by Lord Chesterfield as models of business writing, and the *Négociations* of the President Jeannin (1544–1622), who conducted the affairs of Henry IV. in Holland. The king himself has left a considerable correspondence, which is not destitute of literary merit, though not equal to the memoirs of his wife. The rule of Richelieu was scarcely favorable to memoir writing; but both this and earlier times found chronicle in the singular *Historiettes* of Tallemant des Réaux (1619– ?), a collection of anecdotes, frequently scandalous, reaching from the times of Henry IV. to those of Louis XIV., to which may be joined the *Letters* of Guy Patin (1602–1676). The early years of the latter monarch and the period of the Fronde had the Cardinal de Retz himself, than whom no one was certainly better qualified for historian, not to mention a crowd of others, of whom Madame de Motteville (1621–1689) is perhaps the principal. From this time memoirs and memoir writers went ever multiplying. The queen of them all is Madame de Sévigné (1627–1696), on whom, as on most of the great and better-known writers whom we have had and shall have to mention, it is impossible here to dwell at length. The last half of the century produced crowds of similar but inferior writers. The memoirs of the Duchesse d'Orléans, of Fouquet, of Bussy-Rabutin (author of a kind of scandalous chronicle called *Histoire Amoureuse des Gaules*), and of Madame de Maintenon, perhaps deserve notice above the others. But this was in truth the style of composition in which the age most excelled. Memoir writing became the occupation not so much of persons who made history, as was the case from Comines to De Retz, as of those who, having culture, leisure, and opportunity of observation, devoted themselves to the task of recording the deeds of others, and still more of regarding the incidents of the busy, splendid, and cultivated if somewhat frivolous world of the court, in which, from the time of Louis XIV.'s majority, the political life of the nation and almost its whole history were centred. Many, if not most, of these writers were women, who thus founded the celebrity of the French lady for managing her mother-tongue, and justified by results the taste and tendencies of the blue-stockings and précieuses of the Hôtel Rambouillet and similar coteries. The life which these writers saw before them furnished them with a subject to be handled with the minuteness and care to which they had been accustomed in the ponderous romances of the *Clélie* type, but also with the wit and terseness hereditary in France, and only temporarily absent in those ponderous compositions. The efforts of Balzac and the Academy supplied a suitable language and style, and the increasing tendency towards epigrammatic moralizing, which reached its acme in La Rochefoucauld (1663–1680) and La Bruyère (1639-1696), added in most cases point and attractiveness to their writings.

17th Century Philosophers and Theologians.—To these moralists we might, perhaps, not inappropriately pass at once. But it seems better to consider first the philosophical and theological developments of the age, which must share with its historical experiences and studies the credit of producing these writers. Philosophy proper, as we have already had occasion to remark, had hitherto made no use of the vulgar tongue. The 16th century had contributed a few vernacular treatises on logic, a considerable body of political and ethical writing, and a good deal of sceptical speculation of a more or less vague character, continued into our present epoch by such writers as La Mothe le Vayer (1588–1672), the last representative of the orthodox doubt of Montaigne and Charron. But in metaphysics proper it had not dabbled. The 17th century, on the contrary, was to produce in Descartes (1596–1650) at once a master of prose style, the greatest of French philosophers, and one of the greatest metaphysicians, not merely of France and of the 17th century, but of all countries and times. Even before Descartes there had been considerable and important developments of metaphysical speculation in France. Early in the century, the Italian Lucilio Vanini was burnt at Toulouse, nominally, like Bruno, for atheism, but really for the adoption of the negative philosophy of Pomponatius and others. The first eminent philosopher of French birth was Pierre Gassendi (1592–1655). Gassendi devoted himself to the maintenance of a modernized form of the Epicurean doctrines, but he wrote mainly, if not entirely in Latin. Another sceptical philosopher of a less scientific character was the physicist Naudé, who like many others of the philosophers of the time, was accused of atheism. But as none of these could approach Descartes in philosophical power and originality, so also none has even a fraction of his importance in the history of French literature.

Descartes.

It is with this latter alone that we are here concerned. Descartes stands with Plato, and possibly Berkeley and Malebranche, at the head of all philosophers in respect of style; and in his case the excellence is far more remarkable than in others, inasmuch as he had absolutely no models, and was forced in a great degree to create the language which he used. The *Discours de la Méthode* is not only one of the epoch-making books of philosophy, it is also one of the epoch-making books of French style. Almost every page of it might have been written by a master of the language at the present day, while there is the greatest possible contrast between these pages and those of even the best French prose writers a few years previously. Nor was the influence of Descartes in literature less than his influence in philosophy. The tradition of his clear and perfect style was taken up, not merely by his philosophical disciples, but also by Pascal (1623–1662) and the school of Port Royal, who will be noticed presently. The very genius of the Cartesian philosophy was intimately connected with this clearness, distinctness, and severity of style; and there is something more than a fanciful contrast between these literary characteristics of Descartes, on the one hand, and the elaborate splendor of Bacon, the knotty and crabbed strength of Hobbes, and the commonplace and almost vulgar slovenliness of Locke. Of the followers of Descartes, putting aside the Port Royalists, by far the most distinguished, both in philosophy and in literature, is Malebranche (1631–1715).

Malebranche.

His *Recherche de la Vérité*, admirable as it is for its subtlety and its consecutiveness of thought, is equally admirable for its elegance of style. Malebranche cannot indeed, like his great master, claim absolute originality. But his excellence as a writer is as great as, if not greater than, that of Descartes, and the *Recherche* remains to this day the one philosophical treatise of great length and abstruseness which, merely as a book, is delightful to read,—not like the works of Plato and Berkeley, because of the adventitious graces of dialogue or description, but from the purity and grace of the language, and its admirable adjustment to the purposes of the argument. Yet, for all this, philosophy hardly flourished in France. It was too intimately connected with theological and ecclesiastical questions, and especially with Jansenism, to escape suspicion and persecution. Descartes himself was for much of his life an exile in Holland and Sweden; and though the unquestionable orthodoxy of Malebranche, the strongly religious cast of his works, and the remoteness of the abstruse region in which he sojourned from that of the controversies of the day protected him, other followers of Descartes were not so fortunate. Holland, indeed, became a kind of city of refuge for students of philosophy, though even in Holland itself they were by no means entirely safe from persecution.

Bayle.

By far the most remarkable of French philosophical sojourners in the Netherlands was Pierre Bayle (1647–1706), a name not perhaps of the first rank in respect of literary value, but certainly of the first as regards literary influence. Bayle, after oscillating between the two confessions, nominally remained a Protestant in religion. In philosophy he in the same manner oscillated between Descartes and Gassendi, finally resting in an equally nominal Cartesianism. Bayle was in fact, both in philosophy and in religion, merely a sceptic, with a scepticism at once like and unlike that of Montaigne, and differenced both by temperament and circumstance. The scepticism of Montaigne is mainly moral in character, and represents the good-humored but satiated indifference of the gentleman of the Renaissance, who has known both business and pleasure, and, though undervaluing neither, sees the drawbacks of both. That of Bayle is the scepticism of the mere student, exercised more or less in all histories, sciences, and philosophies, and intellectually unable or unwilling to take a side. His style is hardly to be called good, being diffuse and often inelegant. But his great dictionary, though one of the most heterogeneous and unmethodical of compositions, exercised an enormous influence both on the Continent and in England, especially on the Continent. It has been or might be called the Bible of the 18th century, and contains in the germ all the desultory philosophy, the ill-ordered scepticism, and the critical but negatively critical acuteness of the *Aufklärung*. Locke and Newton had indeed to be superadded to Bayle, and Voltaire in matter, though by no means in form, represents little more than the union of the three.

We have said that the philosophical, theological, and moral tendencies of the century, which produced, with the exception of its dramatic triumphs, all its greatest literary works, are almost inextricably intermingled. Its earliest years, however, bear in theological matters rather the complexion of the previous century. Du Perron and St. Francis of Sales survived until nearly the end of its first quarter, and the most remarkable works of the latter bear the dates of 1608 and later. It was not, however, till some years had passed, till the counter-Reformation had reconverted the largest and most powerful portion of the Huguenot party, and till the influence of Jansenius and Descartes had time to work, that the extraordinary outburst of Gallican theology, both in pulpit and press, took place.

The Jansenists.

The Jansenist controversy may perhaps be awarded the merit of provoking this, as far as writing was concerned. The extraordinary eloquence of contemporary pulpit oratory may be set down partly to the zeal for conversion of which Du Perron and De Sales had given the example, partly to the same taste of the time which encouraged dramatic performances, for the sermon and the tirade have much in common. Jansenius himself, though a Dutchman by birth, passed much time in France, and it was in France that he found most disciples. These disciples consisted in the first place of the members of the society of Port Royal des Champs, a coterie after the fashion of the time, but one which devoted itself not to sonnets or madrigals but to devotional exercises, study, and the teaching of youth.

Port Royal.

This coterie early adopted the Cartesian philosophy, and the Port Royal logic was the most remarkable popular hand-book of that school. In theology they adopted Jansenism, and were in consequence soon at daggers drawn with the Jesuits, according to the polemical habits of the time. The most distinguished champions on the Jansenist side were the Abbé de St. Cyran and Antoine Arnauld, but by far the most important literary results of the quarrel were the famous *Provinciales* of Pascal, or, to give them their proper title, *Lettres Écrites à un Provincial.* The original occasion of these remarkable letters was the condemnation of Arnauld at the Sorbonne. They produced an immense effect; their printers were subjected to vigorous police investigations, but in vain; and the incognito of the author was long preserved.

Pascal.

With their matter we have nothing to do here. Their literary importance consists, not merely in their grace of style, but in the application to serious discussion of the peculiarly polished and quiet irony of which Pascal is the greatest master the world has ever seen. Up to this time controversy had usually been conducted either in the mere bludgeon fashion of the Scaligers and Saumaises,—of which in the vernacular the Jesuit Garasse (1585–1631) had already contributed remarkable examples to literary and moral controversy,—or else in a dull and legal style, or lastly under an envelope of Rabelaisian buffoonery, such as survives to a considerable extent in the *Satire Ménippée.* Pascal set the example of combining the use of the most terribly effective weapons with good humor, good breeding, and a polished style. The example was largely followed, and the manner of Voltaire and his followers in the 18th century owes at least as much to Pascal as their method and manner do to Bayle. The Jansenists, attacked and persecuted by the civil power, which the Jesuits had contrived to interest, were finally suppressed. But the *Provinciales* had given them an unapproachable superiority in matter of argument and literature. Their other literary works were inferior, though still remarkable. Arnauld (1612–1694) and Nicole (1625–1695) managed their native language with vigor, if not exactly with grace. They maintained their orthodoxy by writings, not merely against the Jesuits, but also against the Protestants, such as the *Perpétuité de la Foi* due to both, and the *Apologie des Catholiques* written by Arnauld alone. The latter, besides being responsible for a good deal of the logic (*L'Art de Penser*) to which we have alluded, wrote also much of a *Grammaire Générale* composed by the Port Royalists for the use of their pupils; but his principal devotion was to theology and theological polemics. To the latter Nicole also contributed *Les Visionnaires, Les Imaginaires,* and other works. The studious recluses of Port Royal also produced a large quantity of miscellaneous literary work, to which full justice has been done in Sainte-Beuve's well-known volumes.

17th Century Preachers.—When we think of Gallican theology during the 17th century, it is always with the famous pulpit orators of the period that thought is most busied. Nor is this unjust, for though the most prominent of them all, Bossuet (1627–1704) was remarkable as a writer of matter intended to be read, not merely as a speaker of matter intended to be heard, this double character is not possessed by most of the orthodox theologians of the time; and even Bossuet, great as is his genius, is more of a rhetorician than of a philosopher or a theologian. In no quarter was the advance of culture more remarkable in France than in the pulpit. We have already had occasion to notice the characteristics of French pulpit eloquence in the 15th and 16th centuries. Though this was very far from destitute of vigor and imagination, the political frenzy of the preachers, and the habit of introducing anecdotic buffoonery, spoilt the eloquence of Maillard and of Raulin, of Boucher and of Rose. The powerful use which the Reformed ministers made of the pulpit stirred up their rivals; the advance in science and classical study added weight and dignity to the matter of their discourses. The improvement of prose style and language provided them with a suitable instrument, and the growth of taste and refinement purged their sermons of grossness and buffoonery, of personal allusions, and even, as the monarchy became more absolute, of direct political purpose. The earliest examples of this improved style were given by St. Francis de Sales and by Fenouillet, bishop of Marseilles (d. 1652); but it was not till the latter half of the century, when the troubles of the Fronde had completely subsided, and the church was established in the favor of Louis XIV., that the full efflorescence of theological eloquence took place. There were at the time pulpit orators of considerable excellence in England, and perhaps Jeremy Taylor, assisted by the genius of the language, has wrought a vein more precious than any which the somewhat academic methods and limitations of the French teachers allowed them to reach. But no country has ever been able to show a more magnificent concourse of orators, sacred or profane, than that formed by Bossuet, Fénelon (1651–1715), Fléchier (1632–1710), Mascaron (1634–1703) Bourdaloue (1632–1704), and Massillon (1663–1742) to whom may be justly added the Protestant divines Claude (1619–1687) and Saurin (1677–1730). The characteristics of all these were different.

Bossuet.

Bossuet, the earliest and certainly the greatest, was also the most universal. He was not merely a preacher; he was, as we have said, a controversialist,—indeed, somewhat too much of a controversialist, as his battle with Fénelon proved. He was a philosophical or at least a theological historian, and his *Discours sur l'Histoire Universelle* is equally remarkable from the point of view of theology, philosophy, history, and literature. Turning to theological politics, he wrote his *Politique tirée de l'Écriture Sainte,* to theology proper his *Méditations sur les Évangiles* and his *Élevations sur les Mystères.* But his principal work after all is his *Oraisons Funèbres.* The funeral sermon was the special oratorical exercise of the time. Its subject and character invited the gorgeous if somewhat theatrical commonplaces, the display of historical knowledge and parallel, and the moralizing analogies, in which the age specially rejoiced. It must also be noticed to the credit of the preachers that such occasions gave them opportunity, of which they rarely failed to avail themselves, of correcting the adulation which was but too frequently characteristic of the period. The spirit of these compositions is fairly reflected in the most famous and often quoted of their phrases, the opening "Mes frères, Dieu seul est grand" of Massillon's funeral discourse on Louis XIV.; and though panegyric is necessarily by no means absent, it is rarely carried beyond bounds. While Bossuet made himself chiefly remarkable in his sermons and in his writings by an almost Hebraic grandeur and rudeness, the more special characteristics of Christianity, largely alloyed with a Greek and Platonic spirit, displayed themselves in Fénelon.

Fénelon.

A successor of St. Francis de Sales, he found that even a previous canonization was not a safeguard for imitators. The *Maximes des Saints* of Fénelon, and later his *Mémoires Particuliers* and *Directions pour la Conscience d'un Roi,* were distinguished not only by a mystical theology which was not relished, but also by a very moderate admiration for despotic government. In pure literature Fénelon is not less remarkable than in theology, politics, and morals. His practice in matters of style was admirable, as the universally known *Télémaque* sufficiently shows to those who know nothing else of his writing. But his taste, both in its correctness and its audacity, is perhaps more admirable still. Despite of Malherbe, Balzac, Boileau, and the traditions of nearly a century, he dared to speak favorably of Ronsard, and plainly expressed his opinion that the practice of his own contemporaries and predecessors had cramped and impoverished the French language quite as much as they had polished or purified it. The other doctors whom we have mentioned were more purely theological than the accomplished archbishop of Cambray. Fléchier is somewhat more archaic in style than Bossuet or Fénelon, and he is also more definitely a rhetorician than either. Mascaron has the older fault of prodigal and somewhat indiscriminate erudition. But the two latest of the series, Bourdaloue and Massillon, had far the greatest repute in their own time purely as orators, and perhaps deserved this preference. The difference between the two repeated that between Du Perron and De Sales. Bourdaloue's great forte was vigorous argument and unsparing denunciation, but he is said to have been lacking in the power of influencing and affecting his hearers. His attraction was purely intellectual, and it is reflected in his style, which is clear and forcible, but destitute of warmth and color. Massillon, on the other hand, was remarkable for his pathos, and for his power of enlisting and influencing the sympathies of his hearers. The two Protestant ministers whom we have mentioned, though inferior to their rivals, yet deserve honorable mention among the ecclesiastical writers of the period. Claude engaged in a controversy with Bossuet, in which victory is claimed for the invincible eagle of Meaux. Saurin, by far the greater preacher of the two, long continued to occupy, and, indeed, still occupies, in the libraries of French Protestants the position given to Bossuet and Massillon on the other side.

17th Century Moralists.—It is not surprising that the works of Montaigne and Charron, with the immense popularity of the former, should have inclined the more thoughtful minds in France to moral reflection, especially as many other influences, both direct and indirect, contributed to produce the same result. The constant tendency of the refinements in French prose was towards clearness, succinctness, and precision, the qualities most necessary in the moralist. The characteristics of the prevailing philosophy, that of Descartes, pointed in the same direction. It so happened, too, that the times were more favorable to the thinker and writer on ethical subjects than to the speculator in philosophy proper, in theology, or in politics. Both the former subjects exposed their cultivators, as we have seen, to the suspicion of unorthodoxy; and to political speculation of any kind the rule of Richelieu, and still more that of Louis XIV., were in the highest degree unfavorable. No successors to Bodin and Du Vair appeared; and even in the domain of legal writings, which comes nearest to that of politics, but few names of eminence are to be found. The parliaments were rapidly becoming the submissive instruments of the monarch, and might be expected soon to degenerate into the assemblies which, in the next century, disgraced themselves for ever in the affairs of Calas and Sirven, La Barre and Lally. Only the name of Omer-Talon (1595–1657) really illustrates the legal annals of France at this period on the bench, and that of Patru (1604–1681) at the bar. Thus it happened that the interests of many different classes of persons were concentrated upon moralizings, which took indeed very different forms in the hands of Pascal and other grave and serious thinkers of the Jansenist complexion in theology, and in those of literary courtiers like St. Evremond (1613–1703) and La Rochefoucauld, whose chief object was to depict the motives and characters prominent in the brilliant and not altogether frivolous society in which they moved.

Pascal and pensée-writing.

Both classes, however, were more or less tempted by the cast of their thoughts and the genius of the language to adopt the tersest and most epigrammatic form of expression possible, and thus to originate the "*pensée*" in which, as its greatest writer of this century has said, "the ambition of the author is to put a book into a page, a page into a phrase, and a phrase into a word." The great genius and admirable style of Pascal are certainly not less shown in his *Pensées* than in his *Provinciales*, though perhaps the literary form of the former is less strikingly supreme than that of the latter. The author is more dominated by his subject, and dominates it less. The depth of his thought, of his doubt, of his belief, troubles sometimes the literary perfection of his style, but after all the excellence as literature of the *Pensées* is rather different from that of the *Provinciales* than inferior to it. Nicole, a far inferior writer as well as thinker, has also left a considerable number of *Pensées*, which have about them something more of the essay and less of the aphorism. They are, however, though not comparable to Pascal, excellent in matter and style, and go far to justify Bayle in calling their author "l'une des plus belles plumes de l'Europe." In sharp contrast with these thinkers, who are invariably not merely respecters of religion but ardently and avowedly religious, who treat morality from the point of view of the Bible and the church, there arose side by side with them, or only a little later, a very different group of moralists, whose writings have been as widely read, and who have had as great a practical and literary influence as perhaps any other class of authors.

St. Evremond.

The earliest to be born and the last to die of these was St. Evremond. St. Evremond was long known rather as a conversational wit, some of whose good things were handed about in manuscript, or surreptitiously printed in foreign lands, than as a writer, and this is still to a certain extent his reputation. He was at least as cynical as his still better known contemporary La Rochefoucauld, if not more so, and he had less intellectual force and less nobility of character. But his wit was very great, and it was not restrained by any inconvenient convictions or scruples. Presiding as he did in the society of Ninon de l'Enclos, and over a considerable number of lesser wits, he set the example of the brilliant societies of the next century. These in turn culminated in the Holbachian group which was to render such powerful assistance in the diffusion of philosophism, and to distinguish itself by the freedom, in every sense of the word, of its style of thought and conversation. Many of St. Evremond's printed works are nominally works of literary criticism, but the moralizing spirit pervades all of them. No writer had a greater influence on Voltaire, and through Voltaire on the whole course of French literature after him. In direct literary value, however, no comparison can be made between St. Evremond and the author of the *Sentences et Maximes Morales*.

La Rochefoucauld.

The Duc de la Rouchefoucauld has other literary claims besides those of this famous book. His *Mémoires* were very favorably judged by his contemporaries, and they are still held to deserve no little praise even among the numerous and excellent works of the kind which that age of memoir writers produced. But while the *Mémoires* thus invite comparison, the *Maximes et Sentences* stand alone. Even allowing that the mere publication of detached reflections in terse language was not absolutely new, it had never been carried, perhaps has never since been carried, to such a perfection. Beside La Rochefoucauld all other writers are diffuse, vacillating, unfinished, rough. A very large number of his maxims do not exceed two lines; many are contained in half a dozen words; and though he has no prudish or childish objection to more lengthy reflections, these lengthier sections are proportionately as much crammed and packed with thought as the shorter. The most remarkable thing, however, about them is not that there is never a word too much, but that, pregnant as they are, there is never a word too little. The thought is always fully expressed, not compressed. Frequently as the metaphor of minting or stamping coin has been applied to the art of managing words, it has never been applied so appropriately as to the maxims of La Rochefoucauld, each of which has the beauty, the value, and the clear-cut compactness of a medal. Such criticism as has been directed against them has invariably and necessarily busied itself with their matter, and with the supposed selfish and cynical character of their thought. The form of them is almost beyond praise, and its excellences, combined with their immense and enduring popularity, have had a very considerable share in influencing the character of subsequent French literature. Of hardly less importance in this respect, though of considerably less intellectual and literary individuality, was the translator of Theophrastus and author of the *Caractères*, La Bruyère.

La Bruyère.

La Bruyère, though frequently epigrammatic, did not aim at the same incredible terseness as the author of the *Maximes*. His plan did not, indeed, render it necessary. Both in England and in France there had been during the whole of the century a mania for character writing, both of the general and Theophrastic kind and of the historical and personal order. The latter, of which our own Clarendon is perhaps the greatest master, abound in the French memoirs of the period. The former, of which the naïve sketches of Earle and Overbury are English examples, culminated in those of La Bruyère. These sketches were made palatable originally, though they are perhaps rendered less attractive now, by the multitude of half-veiled allusions to contemporary characters. They do not contain any of the appalling and to some persons repulsive directness and ruthlessness of La Rochefoucauld. They are not only light and easy in manner and matter, but also in style, and in this respect, as in most others, the contrast is remarkable. The work of La Bruyère is essentially amusing, though it is instructive as well. It is the work of a man of great talent, acuteness, and observation, but tolerant to a certain extent of commonplaces and compromises. There is neither compromise nor commonplace in La Rochefoucauld. We have dwelt on these two remarkable books somewhat longer than on most single *chef d'œuvres* of French literature, because of their extraordinary and enduring effect on the literature which followed them—an effect perhaps superior to that exercised by any other single work except the *Roman de la Rose* and the *Essais* of Montaigne.

17th Century Savants.—Of the literature of the 17th century there only remains to be dealt with the section of those writers who devoted themselves to scientific pursuits or to antiquarian erudition of one form or another. It was in this century that literary criticism of French and in French first began to be largely composed. It was very far, however, from attaining the excellence or observing the form which it afterwards assumed. The institution of the Academy led to various linguistic works. One of the earliest of these was the *Remarques* of the Savoyard Vaugelas (1585–1650), afterwards re-edited by Thomas Corneille. Pellisson wrote a history of the Academy itself when it had as yet but a brief one. The famous *Examen du Cid* was an instance of the literary criticism of the time. Later, Boileau set the example of treating such subjects in verse, and in the latter part of the century *Reflections, Discourses, Observations,* and the like, on particular styles, literary forms, and authors, became exceedingly numerous. In earlier years France possessed a numerous band of classical authors of the first rank, such as Scaliger and Casaubon, who did not lack followers. But all or almost all this sort of work was done in Latin, so that it contributed little to French literature properly so-called. On the other hand, mathematical studies were pursued by persons of far other and far greater genius, and, taking from this time forward a considerable position in education and literature in France, had much influence on both. The mathematical discoveries of Pascal and Descartes are well known, and from their time forward until the Revolution men of letters, such as Voltaire and Diderot, who would in England have been likely to hold aloof from such studies, devoted themselves thereto. Of science proper, apart from mathematics, France did not produce many distinguished cultivators in this century. The philosophy of Descartes was not on the whole favorable to such investigations, which were in the next century to be pursued with ardor. Its tendencies found more congenial vent and are more thoroughly exemplified in the famous quarrel between the ancients and the moderns, which was long carried on in the latter part of the century between Boileau and Madame Dacier, on the one hand, and Perrault on the other, and which was so curiously renewed in England. The discussion was conducted, as is well known, without very much knowledge or judgment among the disputants on the one side or on the other. But at this very time there were in France students and scholars of the most profound erudition. We have already mentioned Fleury and his ecclesiastical history. But Fleury is only the last and the most popular of a race of omnivorous and untiring scholars, whose labors have ever since, until the modern fashion of first-hand investigations came in, furnished the bulk of historical and scholarly references and quotations. To this century belong Tillemont (1637–1698), whose enormous *Histoire des Empereurs* and *Mémoires pour servir à l' Histoire Ecclesiastique* served Gibbon and a hundred others as quarry; Ducange (1614–1688), whose well-known glossary was only one of numerous productions; Mabillon (1622–1707), one of the most voluminous of the voluminous Benedictines; and Montfaucon (1655–1741), chief of all authorities of the dry-as-dust kind on classical archæology and art.

Controversy between ancients and moderns.

Opening of the 18th Century.—The beginning of the 18th century is among the dead seasons of French literature. All the greatest men whose names had illustrated the reign of Louis XIV. in profane literature passed away long before him, and the last if the least of them, Boileau and Thomas Corneille, only survived into the very earliest years of the new age. The political and military disasters of the last years of the reign were accompanied by a state of things in society unfavorable to literary development. A show, purely external and hypocritical, of devotion, put on to please the aged monarch, covered an interior of frivolity and licentiousness which was for the time dissevered from such intellectual activity as has often accompanied similar states of morality in France. The devotion to pure literature and philosophy proper which Descartes and Corneille had inspired had died out, and the devotion to physical science, to sociology, and to a kind of free-thinking optimism which was to inspire Voltaire and the Encyclopedists had not yet become fashionable. Fénelon and Malebranche still survived, but they were emphatically men of the last age, as was Massillon, though he lived till nearly the middle of the century. The characteristic literary figures of the opening years of the period are D'Aguesseau, Fontenelle, St. Simon, personages in many ways interesting and remarkable, but purely transitional in their characteristics, and neither themselves indicating new and original paths to others, nor following out to their extremity and climax the paths which others had struck. Fontenelle (1657–1757) is, indeed, perhaps the most typical figure of the time. He was a dramatist, a moralist, a philosopher, physical and metaphysical, a critic, an historian, a poet, and a satirist. The manner of his works is always easy and graceful, and their matter rarely contemptible. We may adopt the same division of subjects in this period as heretofore, with one important addition—a separate heading, namely, for the essayists and literary critics who before the end of the century became of remarkable prominence. The spread of culture, however, and the increase of the mass of literature produced, render it more and more necessary to limit the notice given to those names whose bearers are in one way or another important. Modern literature once fairly constituted, the rank and file of its practitioners must be left unmentioned.

18th Century Poetry.—The dispiriting signs shown during the 17th century by French poetry proper received entire fulfilment in the following age. The two poets who were most prominent at the opening of the period were the Abbé de Chaulieuc (1639–1720) and the Marquis de la Fare (1644–1712), poetical or rather versifying twins who are always quoted together, and the fact of whose quotation as the chief poets of any period, however short, is sufficient proof of the low estate into which poetry must at that period have fallen. They were both men who lived to a great age, yet their characteristics are rather those of their later than of their earlier contemporaries. They derive on the one hand from the somewhat trifling school of Voiture, on the other from the Bacchic sect of St. Amand; and they succeed in uniting the inferior qualities of both with the cramped and impoverished though elegant style of which Fénelon had complained. It is only fair to say that the abbé is not nearly so bad a poet as the marquis. Their compositions are as a rule lyrical, as lyrical poetry was understood after the days of Malherbe,—that is to say, quatrains of the kind ridiculed by Molière, and Pindaric odes, which have been justly described as made up of alexandrines after the manner of Boileau cut up into shorter or longer lengths. They were followed, however, by the one poet who succeeded in producing something resembling poetry in this artificial style, J. B. Rousseau (1674–1741). Rousseau, who in some respects was nothing so little as a religious poet, was nevertheless strongly influenced, as Marot had been by the Psalms of David. His *Odes* and his *Cantates,* though still to English taste curiously devoid of the poetical *je ne sais quoi,* which an Englishman rarely finds in any French lyrist between Regnier and Hugo, are perhaps less destitute of that spirit than the work of any other poet during that long period excepting André Chénier. Rousseau was also an extremely successful epigrammatist, having in this respect, too, resemblances to Marot. Le Franc de Pompignan (1709–1784), to whom Voltaire's well-known sarcasms are not altogether just, and Louis Racine (1692–1763), who wrote pious and altogether forgotten poems, be-

J. B. Rousseau.

longed to the same poetical school; though both the style and matter of Racine are strongly tinctured by his Port Royalist sympathies and education. Those authors form the first of the three poetical schools of the century, though perhaps it would be safer to mark out only two, leaving Voltaire to himself as a master of both schools and a member of neither. The first method of versifying, indeed, subdivided itself into classes, not dissimilar in style to those which we have noticed in the preceding age as characterized respectively by elegance of a somewhat frivolous kind, and jollity not always free from ignoble admixture. The former was represented in the 18th century by the long-lived St. Aulaire (1643–1742), by Gentil Bernard, by the Abbé (afterwards Cardinal) de Bernis (1715–1794), by Dorat (1714–1789), and by Parny (1753–1814), the last the most vigorous, but all somewhat deserving the term applied to Dorat of *ver luisant du Parnasse*. The jovial traditions of St. Amand begat a similar school of anacreontic songsters, which, represented in turn by Panard (1674–1765), Collé (1709–1783), Gouffé (1775–1845), and Desaugiers (1772–1827), led directly to the best of all such writers, Béranger. To this class Rouget de Lisle (1760–1836) perhaps also belongs; though his most famous composition, the *Marseillaise*, is of a different stamp. Nor is the account of the light verse of the 18th century complete without reference to a long succession of fable writers, who, in an unbroken chain, connect La Fontaine in the 17th century with M. Viennet in the 19th. None of the links, however, of this chain, with the exception of Florian, deserve much attention.

Voltaire (poetry).

The universal faculty of Voltaire (1694–1778) showed itself in his poetical productions no less than in his other works, and it is perhaps not least remarkable in verse. It is impossible now-a-days to regard the *Henriade* as anything but a highly successful prize poem, but the burlesque epic of *La Pucelle*, discreditable as it may be from the moral point of view, is remarkable enough as literature. The epistles and satires are among the best of their kind, the verse tales are in the same way admirable, and the epigrams, impromptus, and short miscellaneous poems generally are the *ne plus ultra* of verse which is not poetry. It is impossible, moreover, not to be grateful to Voltaire for refusing to countenance by his example the second school of verse to which we have alluded. The Anglomania of the century extended into poetry, and the *Seasons* of Thomson set the example of a whole library of tedious descriptive verse, which in its turn revenged France upon England by producing or helping to produce English poems of the Darwin school. The first of these descriptive performances was the *Saisons* of St. Lambert (1717–1803), identical in title with its model, but of infinitely inferior value. St. Lambert was followed by Delille (1738–1813) in *Les Jardins*, Le Mierre (1723–1793) in *Les Fastes*, and Roucher (1745–1794) in *Les Mois*. Indeed, everything that could be described was seized upon by these describers. Delille also translated the *Georgics*, and for a time was the greatest living poet of France, the title being only disputed by Le Brun (1729–1807), a lyrist and ode writer of the school of J. B. Rousseau, but not destitute of energy. The only other poets until Chénier who deserve notice are Gilbert (1751–1780),—the French Chatterton, or perhaps rather the French Oldham, who died in a workhouse at twenty-nine after producing some vigorous satires and, at the point of death, an elegy of great beauty,—and Gresset (1709–1777), the author of *Ver-Vert* and of other poems of the lighter order, which are not far, if at all, below the level of Voltaire.

Chénier.

André Chénier (1762–1794) stands far apart from the art of his century, though the strong chain of custom, and his early death by the guillotine, prevented him from breaking through the fatal restraints of its language and its versification. Chénier, half a Greek by blood, was wholly one in spirit and sentiment. The manner of his verses, the very air which surrounds them and which they diffuse, are different from those of the 18th century; and his poetry is probably the utmost that the language and versification of Racine could produce. To do more, the Revolution which followed a generation after his death was required.

18th Century Drama.—The results of the cultivation of dramatic poetry at this time were even less individually remarkable than those of the attention paid to poetry proper. Here again the astonishing power and literary aptitude of Voltaire gave value to his attempts in a style which, notwithstanding that it counts Racine among its practitioners, was none the less predestined to failure.

Voltaire (plays).

Voltaire's own efforts in this kind are indisputably as successful as they could be. Foreigners usually prefer *Mahomet* and *Zaïre* to *Bajazet* and *Mithridate*, though there is no doubt that no work of Voltaire's comes up to *Polyeucte* and *Rodogune*, as certainly no single passage in any of his plays can approach the best passages of *Cinna* and *Les Horaces*. But the remaining tragic writers of the century, with the single exception of Crébillon *père*, are scarcely third-rate. Crébillon (1674–1763) himself had genius, and there are to be found in his work evidences of a spirit which had seemed to die away with *St. Genest*, and was hardly to revive until *Hernani*. Of the imitators of Racine and Voltaire, La Motte (1672–1731) in *Inez de Castro* was not wholly unsuccessful. La Grange-Chancel copied chiefly the worst side of the author of *Britannicus*, and Saurin (1706–1781) and De Belloy (1727–1775) performed the same service for Voltaire. There was an infinity of tragic writers and tragic plays in this century, but hardly any others of them even deserve mention. The muse of comedy was decidedly more happy in her devotees. Molière was a far safer if a more difficult model than Racine, and the inexorable fashion which had bound down tragedy to a feeble imitation of Euripides did not similarly prescribe an undeviating adherence to Terence. Tragedy had never been, has scarcely been since, anything but an exotic in France; comedy was of the soil and native. Very early in the century Le Sage (1668–1747), in the admirable comedy of *Turcaret*, produced a work not unworthy to stand by the side of all but his master's best. Destouches (1680–1754) was also a fertile comedy writer in the early years of the century, and in *Le Glorieux* and *Le Philosophe Marié* achieved considerable success. As the age went on, comedy, always apt to lay hold of passing events, devoted itself to the great struggle between the Philosophes and their opponents. Curiously enough, the party which engrossed almost all the wit of France had the worst of it in this dramatic portion of the contest, if in no other. The *Méchant* of Gresset and the *Métromanie* of Piron (1689–1773) were far superior to anything produced on the other side, and the *Philosophes* of Palissot (1734–1814), though scurrilous and broadly farcical, had a great success. On the other hand, it was to a Philosophe that the invention of a new dramatic style was due, and still more the promulgation of certain ideas on dramatic criticism and construction, which, after being filtered through the German mind, were to return to France and to exercise the most powerful influence on its dramatic productions.

Diderot (plays).

This was Diderot (1713–1784), the most fertile genius of the century, but also the least productive in finished and perfect work. His chief dramas, the *Fils Naturel* and the *Père de Famille*, are certainly not great successes; the shorter plays, *Est-il bon? est-il méchant?* and *La Pièce et la Prologue*, are better. But it was his follower Sédaine (1717–1779) who in *Le Philosophe sans le savoir* and other pieces produced the best examples of the bourgeois as opposed to the heroic drama. Diderot is sometimes credited or discredited with the invention of the *Comédie Larmoyante*, a title which indeed his own plays do not altogether refuse, but this special variety seems to be in its invention rather the property of La Chaussée (1692–1754). Comedy sustained itself, and even gained ground towards the end of the century; at the extrême limit of our present period there appears the remarkable figure of Beaumarchais (1732–1799).

Beaumarchais.

The *Mariage de Figaro* and the *Barbier de Séville* are well known as having had attributed to them no mean place among the literary causes and forerunners of the Revolution. Their dramatic and literary value would itself have sufficed to obtain attention for them at any time, though there can be no doubt that their popularity was mainly due to their political appositeness. The most remarkable point about them, as about the school of comedy of which Congreve was the chief master in England at the beginning of the century, was the abuse and superfluity of wit in the dialogue, indiscriminately allotted to all characters alike.

18th Century Fiction.—With prose fiction the case was altogether different. We have seen how the short tale of a few pages had already in the 16th century attained high if not the highest excellence; how at three different periods the fancy for long-winded prose narration developed itself in the prose rehandlings of the chivalric poems, in the *Amadis* romances, and in the portentous recitals of Gomberville and La Calprénède; how burlesques of these romances were produced from Rabelais to Scarron; and how at last Madame de Lafayette showed the way to something like the novel of the day. If we add the fairy story, and a small class of miniature romances, of which *Aucassin et Nicolette* in the 13th, and the delightful *Jehan de Paris* (of the 15th or 16th, in which a king of England is patriotically sacrificed) are good representatives, we shall have exhausted the list. The 18th century was quick to develop the system of the author of the *Princesse de Clèves*, but it did not abandon the cultivation of the romance, that is to say, fiction dealing with incident and with the simpler passions, in devoting itself to the novel, that is to say, fiction dealing with the analysis of sentiment and character. **Le Sage.** Le Sage, its first great novelist, in his *Diable Boiteux* and *Gil Blas*, went to Spain not merely for his subject but also for his inspiration and manner, following the lead of the picaroon romance of De Rojas and Scarron. Like Fielding, however, whom he much resembles, Le Sage mingled with the romance of incident the most careful attention to character and the most lively portrayal of it, while his style and language are such as to make his work one of the classics of French literature. The novel of character was really founded in France by the Abbé Prévost (1697–1763), the author of *Cleveland* and of the incomparable *Manon Lescaut*. The popularity of this style was much helped by the immense vogue in France of the works of Richardson. Side by side with it, however, and for a time enjoying still greater popularity, there flourished a very different school of fiction, of which Voltaire, whose name occupies the first or all but the first place in every branch of literature of his time, was the most brilliant cultivator. This was a direct development of the 16th century *conte*, and consisted usually of the treatment in a humorous, satirical, and not always over-decent fashion of contemporary foibles, beliefs, philosophies, and occupations. These tales are of every rank of excellence and merit both literary and moral, and range from the astonishing wit, grace, and humor of *Candide* and *Zadig* to the book which is Diderot's one hardly pardonable sin, and the similar but more lively efforts of Crébillon *fils* (1707–1777). These latter deeps led in their turn to the still lower depths of La Clos and Louvet. A third class of 18th century fiction consists of attempts to return to the humorous *fatrasie* of the 16th century, attempts which were as much influenced by Sterne as the sentimental novel was by Richardson. The *Homme aux Quarante Écus* of Voltaire has something of this character, but the most characteristic works of the style are the *Jacques le Fataliste* of Diderot, which shows it nearly at its best, and the *Compère Mathieu*, sometimes attributed to Pigault-Lebrun (1753–1835), but apparently in reality due to Du Laurens (1719–1797), which shows it at perhaps its worst. Another remarkable story-teller was Cazotte (1724–1793), whose *Diable Amoureux* displays much fantastic power, and connects itself with a singular fancy of the time for occult studies and *diablerie*, manifested later by the patronage shown to Cagliostro, Mesmer, St. Germain, and others. In this connection, too, may perhaps also be mentioned most appropriately Restif de la Bretonne, a remarkably original and voluminous writer, who was little noticed by his contemporaries and successors for the best part of a century, and whom bibliomania chiefly has of late induced French critics to resuscitate. Restif, who was nick-named the "Rousseau of the gutter," *Rousseau du ruisseau*, presents to an English imagination many of the characteristics of a non-moral Defoe. While these various schools busied themselves more or less with real life seriously depicted or purposely travestied, the great vogue and success of *Télémaque* produced a certain number of didactic works, in which moral or historical information was sought to be conveyed under a more or less thin guise of fiction. Such was the *Voyage du Jeune Anacharsis* of Barthélemy (1716–1795); such the *Numa Pompilius* and *Gonzale de Cordoue* of Florian (1755–1794), who also deserves notice as a writer of pastorals, fables, and short prose tales; such the *Bélisaire* and *Les Incas* of Marmontel (1728–1799). Between this class and that of the novel of sentiment may perhaps be placed *Paul et Virginie* and *La Chaumière Indienne;* though Bernardin de St. Pierre (1737–1814) should perhaps properly be noticed after Rousseau and as a moralist. Diderot's fiction-writing has already been referred to more than once, but his *Religieuse* deserves citation here as a powerful specimen of the novel both of analysis and polemic; while his undoubted masterpiece, the *Neveu de Rameau*, though very difficult to class, comes under this head as well as under any other. There are, however, two of the novelists of this age, and of the most remarkable, who have yet to be noticed, and these are the author of *Marianne* and the author of *Julie*. **Marivaux.** We do not mention Marivaux (1688–1763) in this connection as the equal of Rousseau (1713–1778), but merely as being in his way almost equally original and equally remote from any suspicion of school influence. He began with burlesque writing, and was also the author of several comedies, of which *Les Fausses Confidences* is the principal. But it is in prose fiction that he really excels. He may claim to have, at least in the opinion of his contemporaries, invented a style, though perhaps the term *marivaudage*, which was applied to it, has a not altogether complimentary connotation. He may claim also to have invented the novel without a purpose, which aims simply at amusement, and at the same time does not seek to attain that end by buffoonery or by satire. Gray's definition of happiness, "to lie on a sofa and read endless novels by Marivaux" (it is true that he added Crébillon), is well known, and the production of mere pastime by means more or less harmless has since become so well-recognized a function of the novelist that Marivaux, as one of the earliest to discharge it, deserves notice. **J. J. Rousseau.** The name, however, of Jean Jacques Rousseau is of far different importance. His two great works, the *Nouvelle Héloïse* and *Émile*, are as far as possible from being perfect as novels. But no novels in the world have ever had such influence as these. To a great extent this influence was due mainly to their attractions as novels, imperfect though they may be in this character, but it was beyond dispute also owing to the doctrines which they contained, and which were exhibited in novel form. They had not only a greater popularity than any other works of the same class during the century, not only a more important political and philosophical influence, but also a far greater practical influence than is generally supposed. As the fact has been lately treated as doubtful, it may be well to repeat that the *Émile* did actually to a great extent put a stop to the habit previously prevailing among French mothers of refusing to nurse their own infants, and that the recommendation which the same book contained that all children should be taught a trade undoubtedly contributed to the preservation and power of self-support of great numbers of the emigrants during the French Revolution. Great as has been the influence of prose fiction in various ways, this is perhaps the most direct and certain instance of its influence upon the daily life and conduct of large classes of men. Certainly it is the earliest of such instances, and this makes it remarkable in the history of literature.

Such are the principal developments of fiction during the century; but it is remarkable that, varied as they were, and excellent as was some of the work to which they gave rise, none of these schools were directly very fertile in results or successors. The period with which we shall next have to deal, that from the outbreak of the Revolution to the death of Louis XVIII., is curiously barren of fiction of any merit. It has been frankly noticed by French writers that since the Middle Ages many if not most of their great literary developments have needed the stimulus of foreign example and importation. Thus, in part of the 16th century the influence of Italy was predominant and productive, in the 17th that of Spain, in the 18th that of England. Less powerful during the thirty years of war, English influence began again to assert itself in the 19th century. Byron and Shakespeare, well or ill understood, were responsible for much of the development on the poetical side of the romantic movement. But their influence was as nothing compared with that of Scott on the prose side, and especially on the side of prose fiction. As yet, however, this influence was remote. The result of its working was that the prose romance began once more to be written in the later days of the Restoration, with the astonishing success which in the course of the last half-century has placed the French novel in quantity and general excellence, if not in the quality of a few chosen examples, at the head of the fictitious literature of modern Europe.

18th Century History.—It is not, however, in any of the departments of *belles lettres* that the real eminence of the 18th century as a time of literary production in France consists. In all serious branches of study its accomplishments

Montesquieu.

were, in a literary point of view, remarkable, uniting as it did an extraordinary power of popular and literary expression with an ardent spirit of inquiry, a great speculative ability, and even a far more considerable amount of laborious erudition than is generally supposed. The popular and rather desultory character of many of these researches and speculations makes it somewhat difficult to arrange them in an orderly fashion under the heads of separate departments of science. Historical, theological, metaphysical, physical, economical, political, and moral speculations confuse themselves constantly in the same author, and very often in the same work, and any division that can be adopted must be almost of necessity in many respects a cross division. The advantages, however, of maintaining some sort of order are so unmistakable that we shall continue to observe the arrangement hitherto adopted. The historical studies and results of the 18th century speculation in France are of especial and peculiar importance. There is no doubt that what is called the science of history dates from this time, and though the beginning of it is usually assigned to the Italian Vico, its complete indication may perhaps with equal or greater justice be claimed by the Frenchman Turgot. Before Turgot, however, there were great names in French historical writing, and perhaps the greatest of all is that of Montesquieu (1689–1755). The three principal works of this great writer are all historical and at the same time political in character. In the *Lettres Persanes* he handled, with wit inferior to the wit of no other writer even in that witty age, the corruptions and dangers of contemporary morals and politics. The literary charm of this book—the plan of which was suggested by a work of Dufresny (1648–1724), a comic writer not destitute of merit—is very great, and its plan was so popular as to lead to a thousand imitations, of which all, except those of Voltaire and Goldsmith, only bring out the immense superiority of the original. Few things could be more different from this lively and popular book than Montesquieu's next work, the *Grandeur et Décadence des Romains*, in which the same acuteness and knowledge of human nature are united with considerable erudition, and with a weighty though perhaps somewhat grandiloquent and rhetorical style. His third and greatest work, the *Esprit des Lois*, is again different both in style and character. Its defect is too hasty and sweeping generalization on facts insufficiently collected and observed. But this defect is as nothing as compared with the merits of its fertility in ideas, its splendid breadth of view, and the felicity with which the author, in a manner unknown before, recognizes the laws underlying complicated assemblages of fact which had up to that time been considered as connected only by the hazards of fate or by arbitrary causes. The style of this great work is equal to its substance; less light than that of the *Letters*, less rhetorical than that of the *Grandeur des Romains*, it is still a marvellous union of dignity and wit. Around Montesquieu, partly before and partly after him, is a group of philosophical or at least systematic historians, of whom the chief are Dubos (1670–1742), Boulainvilliers (1658–1722), and Mably (1709–1785). Dubos, whose chief work is not historical but æsthetic (*Réflexions sur la Poésie et la Peinture*), wrote a so-called *Histoire Critique de l'Établissement de la Monarchie Française*, which is as far as possible from being in the modern sense critical, inasmuch as, in the teeth of history, and in order to exalt the *Tiers État*, it pretends an amicable coalition of Franks and Gauls, and not an irruption by the former. Boulainvilliers, on the other hand, maintained the rights of the nobility in virtue and as a consequence of the Frankish conquest. Mably (*Observations sur l'Histoire de la France*) had a much greater influence than either of these writers, and a decidedly mischievous one, especially at the period of the Revolution. He, more than any one else, is responsible for the ignorant and childish extolling of Greek and Roman institutions, and the still more ignorant depreciation of the Middle Ages, which was for a time characteristic of French politicians. Montesquieu was, as we have said, followed by Turgot (1727–1781), whose writings are few in number, and not remarkable for style, but full of original thought. Turgot in his turn was followed by Condorcet (1743–1794), whose tendency is somewhat more sociological than directly historical. Towards the end of the period, too, a considerable number of philosophical histories were written, the usual object of which was, under cover of a kind of allegory, to satirize and attack the existing institutions and government of France. The most famous of these was the *Histoire des Indes*, nominally written by the Abbé Raynal (1711–1796), but really the joint work of many members of the Philosophe party, especially Diderot. Side by side with this really or nominally philosophical school of history there existed another and less ambitious school, which contented itself with the older and simpler view of the science. The Abbé de Vertot (1655–1735) belongs almost as much to the 17th as to the 18th century; but his principal works, especially the famous *Histoire des Chevaliers de Malte*, date from the later period, as do also the *Révolutions Romaines*. Vertot is above all things a literary historian, and the well-known "Mon siége est fait," whether true or not, certainly expresses his system. Of the same school, though far more comprehensive, was the laborious Rollin (1661–1741), whose works in the original or translated were long the chief historical manuals of Europe. In the same class, too, far superior as is his literary power, must be ranked the historical works of Voltaire, *Charles XII.*, *Pierre le Grand*, etc. A very perfect example of the historian who is literary first of all is supplied by Rulhière (1735–1791), whose *Révolution en Russie en 1762* is one of the little masterpieces of history, while his larger and posthumous work on the last days of the Polish kingdom exhibits perhaps some of the defects of this class of historians. Lastly must be mentioned the memoirs and correspondence of the period, the materials of history if not history itself. The century opened with the most famous of all of these, the memoirs of the Duc de St. Simon (1678–1755), an extraordinary series of pictures of the court of Louis XIV. and the Regency, written in an unequal and incorrect style, but with something of the irregular excellence of the great 16th century writers, and most striking in the sombre bitterness of its tone. The subsequent and less remarkable memoirs of the century are so numerous that it is almost impossible to select a few for reference, and altogether impossible to mention all. Of those bearing on public history the memoirs of De Staal, of D'Argenson, of Duclos, of Weber, of Madame de Genlis, of Bésenval, of Madame Campan, may perhaps be selected for mention; of those bearing on literary and private history, the memoirs of Madame d'Épinay, and the innumerable writings having reference to Voltaire and to the Philosophe party generally. Here, too, may be mentioned a remarkable class of literature, consisting of purely private and almost confidential letters, which were written at this time with very remarkable literary excellence. As specimens may be selected those of Mademoiselle Aissé (1693–1733), which are models of easy and unaffected tenderness, and those of Mademoiselle de Lespinasse, the companion of Madame du Deffand and afterwards of D'Alembert. These latter, in their extraordinary fervor and passion, not merely contrast strongly with the generally languid and frivolous gallantry of the age, but also constitute one of its most remarkable literary monuments. It has been said of them that they "burn the paper," and the expression is not exaggerated. While the imaginative works of the period were quite unable, with perhaps the exception of *Manon Lescaut* and the *Nouvelle Héloïse*, to express depth or heat of passion, these letters, written straight from the heart, equal anything that poet or novelist has ever elaborated. Of lighter letters the charming correspondence of Diderot with Mademoiselle Voland deserves special mention. But the correspondence, like the memoirs of this century, defies justice to be done to it in any cursory or limited mention. In this connection, however, it may be well to mention some of the most remarkable works of the time, the *Confessions*, *Rêveries*, and *Promenades d'un Solitaire* of Rousseau. In these works, especially in the *Confessions*, there is not merely exhibited passion as fervid though perhaps less unaffected than that of Mademoiselle de Lespinasse,—there appear in them two literary characteristics which, if not entirely novel (no literary characteristic is ever entirely novel), were for the first time brought out deliberately by powers of the first order, were for the first time made the mainspring of literary interest, and thereby set an example which for more than a century has been persistently followed, and which has produced some of the finest results of modern literature. The first of these was the elaborate and unsparing analysis and display of the motives, the weaknesses, and the failings of individual character. This process, which Rousseau unflinchingly performed on himself, has been followed usually in respect to fictitious characters by his successors.

Up to his time character-handling had been mainly abandoned to the dramatist, the satirist, the historian, the moralist, and the preacher, whose purposes led them to use bright or dark colors, bold outlines, and strongly contrasted lights and shades. Rousseau set the example of drawing a character in all its complexity, of showing the mixture of meanness and nobleness, and the intricate processes which led to the commission of acts the simplest in appearance. The other novelty was the feeling for natural beauty and the elaborate description of it, the credit of which latter must, it has been agreed by all impartial critics, be assigned rather to Rousseau than to any other writer. His influence in this direction was, however, soon taken up and continued by Bernardin de St. Pierre, some of whose works have been already alluded to. In sentiment as well as in literary history Bernardin de St. Pierre is the connecting link between Rousseau and Chateaubriand, and thus occupies a position of considerable interest. In particular the author of *Paul et Virginie* set himself to develop the example of description which Rousseau had set, and his word-paintings, though less powerful than those of his model, are more abundant, more elaborate, and animated by a more amiable spirit.

Condillac.

18th Century Philosophy.—The Anglomania which distinguished the time was nowhere more strongly shown than in the cast and direction of its philosophical speculations. As Montesquieu and Voltaire had imported into France a vivid theoretical admiration for the British constitution and for British theories in politics, so Voltaire, Diderot, and a crowd of others popularized and continued in France the philosophical ideas of Hobbes and Locke and even Berkeley, the theological ideas of Bolingbroke, Shaftesbury, and the English deists, and the physical discoveries of Newton. Descartes, Frenchman and genius as he was, and though his principles in physics and philosophy were long clung to in the schools, was completely abandoned by the more adventurous and progressive spirits. At no time indeed, owing to the confusion of thought and purpose to which we have already alluded, was the word philosophy used with greater looseness than at this time. Using it as we have hitherto used it in the sense of metaphysics, the majority of the Philosophes have very little claim to their title. They were all more or less partisans of materialism, but few of them were contented with arguing materialism out on purely philosophical grounds, or with purely philosophical applications. They usually busied themselves with deducing it from physical considerations, and with applying it to ethical and theological conclusions. There were some who manifested, however, an aptitude for purely philosophical argument, and one who confined himself strictly thereto. Among the former the most remarkable are La Mettrie (1709–1751) and Diderot. La Mettrie in his works *L'Homme Machine, L'Homme Plante*, etc., applied a lively and vigorous imagination, a considerable familiarity with physics and medicine, and a brilliant but unequal style to the task of advocating materialistic ideas on the constitution of man. Diderot, in a series of early works, *Lettre sur les Aveugles*, *Promenade d'un Sceptique*, *Pensées Philosophiques*, etc., exhibited a good acquaintance with philosophical history and opinion, and gave sign in this direction, as in so many others, of a far-reaching intellect. As in almost all his works, however, the value of the thought is extremely unequal, while the different pieces, always written in the hottest haste, and never duly matured or corrected, present but few specimens of finished and polished writing. Bonnet (1724–1793), a Swiss of Geneva, wrote a large number of works, many of which are purely scientific. Others, however, are more psychological, and these, though advocating the materialistic philosophy generally in vogue, were remarkable for uniting materialism with an honest adherence to Christianity. The half mystical writer, St. Martin, also deserves notice. But the French metaphysician of the century is undoubtedly Condillac (1714–1780), almost the only writer of the time in France who succeeded in keeping strictly to philosophy without attempting to pursue his system to its results in ethics, politics, and theology; still more without desiring to anticipate such results, and to discuss the application of a philosophy before the philosophy was itself established. In the *Traité des Sensations*, the *Essai sur l'Origine des Connaissances Humaines*, and other works Condillac elaborated and continued the imperfect sensationalism of Locke. As his philosophical view, though perhaps more restricted, was far more direct, consecutive, and uncompromising than that of the Englishman, so his style greatly exceeded Locke's in clearness and elegance. It cannot pretend to vie with the beauty and artistic suitability of the styles of Descartes and Malebranche, nor with that of Condillac's elder contemporary Berkeley. But for all that, it is a good medium of philosophical expression, and its literary character did not a little to assist the diffusion of the principles of materialism.

Voltaire (theology).

18th Century Theology.—To devote a section to the history of the theological literature of the 18th century in France may seem something of a contradiction; for, indeed, all or most of such literature was anti-theological. The magnificent list of names which the church had been able to claim on her side in the 17th century was exhausted before the end of the second quarter of the 18th with Massillon, and none came to fill their place. Very rarely has orthodoxy been so badly defended as at this time. The literary championship of the church was entirely in the hands of the Jesuits, and of a few disreputable literary free-lances like Fréron (1719–1776) and Desfontaines. The Jesuits were learned enough, and their principal journal, that of Trévoux, was conducted with much vigor and a great deal of erudition. But they were in the first place discredited by the moral taint which has always hung over Jesuitism, and in the second place by the persecutions of the Jansenists and the Protestants, which were attributed to their influence. No single name or work on the orthodox side has preserved the least reputation; while, on the other hand, the names of Père Nonotte and several of his fellows have been enshrined unenviably in the imperishable ridicule of Voltaire, one only of whose adversaries, Guénée (1717–1803), was able to meet him at something like his own weapons. At the same time, while religion and the church were never so badly off for defenders, they had never been, and have never been, so desperately in need of defence. The financial condition of the church was in scandalous contrast with the need and bankruptcy of the state. The lives of too many of its ministers were in more scandalous contrast still with its doctrines and precepts; while its political ascendency, and the use made of it, were felt to be, not merely unjust and improper in themselves, but an almost insuperable barrier to social and political reform. Meanwhile a spirit of hostility had long been growing up, not merely to the church, but to Christianity and religion itself, which was not entirely due to ecclesiastical corruptions. The Renaissance by its paganism, the Reformation by its latitudinarian developments, and the growth of modern science by its materialistic tendencies, had all contributed to this anti-theological movement. Even in the reign of Louis XIV. there was a considerable school of free-thinkers at the French court, and when the restraint of that monarch's devotion was removed the number became largely increased, especially as the study of the writings of the English deists came to strengthen the tendency. It has never been at all accurately decided how far what may be called the scoffing school of Voltaire represents a direct revolt against Christianity, and how far it was merely a kind of guerilla warfare against the clergy. It is positively certain that Voltaire was not an atheist, and that he did not approve of atheism. But for his aggressive and reforming tendencies he might very likely have confined himself to the colorless and speculative deism of Bolingbroke and Shaftesbury. As it was, however, he went farther, and his *Dictionnaire Philosophique*, which is typical of a vast amount of contemporary and subsequent literature, consists of a heterogeneous assemblage of articles directed against various points of dogma and ritual and various characteristics of the sacred records. From the literary point of view, it is one of the most characteristic of all Voltaire's works, though it is perhaps not entirely his. The desultory arrangement, the light and lively style, the extensive but not always too accurate erudition, and the somewhat captious and quibbling objections, are intensely Voltairian. But there is little seriousness about it, and certainly no kind of rancorous or deep-seated hostility. With many, however, of Voltaire's pupils and younger contemporaries the case was altered. They were distinctively atheists and anti-supernaturalists. The atheism of Diderot, unquestionably the greatest of them all, has been keenly debated; but in the case of Damilaville, Naigeon, Holbach, and others there is no room for doubt. By these persons a great mass of atheistic and anti-Christian literature was composed and set afloat. The characteristic work

The system of Nature.

Chamfort. Rivarol.

of this school, its last word indeed, is the famous *Système de la Nature*, attributed to Holbach (1723–1789), but known to be, in part at least, the work of Diderot. In this remarkable work, which caps the climax of the metaphysical materialism or rather nihilism of the century, the atheistic position is clearly put. It made an immense sensation; and it so fluttered not merely the orthodox but the more moderate free-thinkers, that Frederick of Prussia and Voltaire, perhaps the most singular pair of defenders that orthodoxy ever had, actually set themselves to refute it. The extreme unpopularity and startling nature of its tenets, which we do not here judge, have been wont to reflect themselves in the criticisms passed on it merely as a book. Viewed in this light, without prejudice either way, it must be pronounced undeserving of much of this unfavorable criticism. Its style and argument are very unequal, as books written in collaboration are apt to be, and especially books in which Diderot, the paragon of inequality, had a hand. But there is on the whole a great consistency and even rigor in the argument; there is an almost entire absence of the heterogeneous assemblage of anecdotes, jokes good and bad, scraps of accurate or inaccurate physical science, and other incongruous matter with which the Philosophes were wont to stuff their works; and lastly, there is in the best passages a kind of sombre grandeur which recalls the manner as well as the matter of Lucretius. It is perhaps well to repeat, in the case of so notorious a book, that this criticism is of a purely literary and formal character; but there is little doubt that the literary merits of the work considerably assisted its didactic influence. As the Revolution approached, and the victory of the Philosophe party was declared, there appeared for a brief space a group of cynical and accomplished phrasemakers presenting some similarity to that of which a hundred years before St. Evremond was the most prominent figure. The chief of this group were Chamfort (1747–1794) on the republican side, and Rivarol (1753–1801) on that of the royalists. Like the older writer to whom we have compared them, neither can be said to have produced any one work of eminence, and in this they stand distinguished from moralists like La Rochefoucauld. The floating sayings, however, which are attributed to them, or which occur here and there in their miscellaneous work, yield in no respect to those of the most famous of their predecessors in wit and a certain kind of wisdom, though they are frequently more personal than aphoristic.

Helvétius.

Thomas.

Vauvenargues.

18th Century Moralists and Politicians.—Not the least part, however, of the energy of the period in thought and writing was devoted to questions of a directly moral and political kind. The grave social and economical evils under which France labored made this devotion almost inevitable; and though we have already noticed under the head of history a certain number of works written under this inspiration, a still larger proportion remains to be mentioned—moral, political, and economical works having had, from the time of Aristotle downwards, sufficient connection to be treated together. With regard to morality proper the favorite doctrine of the century was what is commonly called the selfish theory, the only one indeed which was suitable to the sensationalism of Condillac and the materialism of Holbach. The pattern book of this doctrine was the *De l'Esprit* of Helvétius (1715–1771), the most amusing book perhaps which ever pretended to the title of a solemn philosophical treatise. There is some analogy between the principles of this work and those of the *Système de la Nature*. With the inconsistency—some would say with the questionable honesty—which distinguished the more famous members of the Philosophe party when their disciples spoke with what they considered imprudent outspokenness, Voltaire and even Diderot attacked Helvétius as the former afterwards attacked Holbach. Both were guilty of disregarding the curious cant of noble sentiment which was so dear to the 18th century, and with the tenacious steadiness of traditional criticism it has been usual to speak slightingly of Helvétius ever since. The truth is that, whatever may be the general value of *De l'Esprit*, it is full of acuteness, though that acuteness is as desultory and disjointed as its style. As Helvétius may be taken as the representative author of the cynical school, so perhaps Thomas (1732–1795) may be taken as representative of the votaries of noble sentiment to whom we have also alluded. The works of Thomas chiefly took the form of academic *éloges* or formal panegyrics, and they have all the defects, both in manner and substance, which are associated with that style. They were, however, useful in their way, as counteracting the prevailing cynicism, and have some literary importance, as being perhaps the least dead of an enormous mass of similar literature which was composed at the time. Of yet a third school, corresponding in form to La Rochefoucauld and La Bruyère, and possessed of some of the antique vigor of preceding centuries, was Vauvenargues (1715–1747). This writer, who died very young, has produced maxims and reflections of considerable mental force and literary finish. From Voltaire downwards it has been usual to compare him with Pascal, from whom he is chiefly distinguished by a striking but somewhat empty stoicism. Between the moralists, of whom we have taken these three as examples, and the politicians may be placed Rousseau, who in his novels and miscellaneous works is of the first class, in his famous *Contrat Social* of the second. The characteristics of Rousseau are too well known to need lengthy description. His discontent with the established social order and arrangements of the world led him, on the one hand, to advocate alterations in individual morality, such as the discarding of the vices and corruptions of civilization, and the return to a simpler and less complicated manner of living; on the other to develop and urge theories respecting the constitution of the body politic, which, if not altogether novel in their nature, were made so by the force of their statement and the literary beauties of its form. Rousseau's work was continued on the moral and literary rather than the political side by Bernardin de Saint Pierre. Of direct and avowed political writings there were few during the century, and none of anything like the importance of the *Contrat Social*, theoretical acceptance of the established French constitution being a point of necessity with all Frenchmen. Nevertheless it may be said that almost the whole of the voluminous writings of the Philosophes, even of those who, like Voltaire, were sincerely aristocratic and monarchic in predilection, were of more or less veiled political significance. There was one branch of political writing, moreover, which could be indulged in without much fear. The form of government was sacred, but the conduct of government could be discussed without much danger, for, whatever might be the divine rights of the best of princes, his intentions might always be frustrated by wicked or incapable ministers and officials. Political economy, therefore, and administrative theories, received much attention. The earliest writer of eminence on these subjects was the great engineer Vauban (1633–1707), whose *Oisivetés* and *Dîme Royale* exhibit both great ability and extensive observation. A more utopian enconomist of the same time was the Abbé de St. Pierre (1658–1743), not to be confounded with the author of *Paul et Virginie*. Soon political economy in the hands of Quesnay (1694–1774) took a regular form, and towards the middle of the century a great number of works on questions connected with it, especially that of free trade in corn, on which the Abbé Galiani (1723–1787), Morellet, and above all Turgot, distinguished themselves. Of writers on legal subjects and of the legal profession, the century, though not less fertile than in other directions, produced few or none of any great importance from the literary point of view. The chief name which in this connection is known is that of Chancellor d'Aguesseau (1668–1751), at the beginning of the century, an estimable writer of the Port Royal school, who took the orthodox side in the great disputes of the time, but failed to display any great ability therein. He was, as became his profession, more remarkable as an orator than a writer, and his works contain valuable testimonies to the especially perturbed and unquiet condition of his century—a disquiet which is perhaps also its chief literary note. There were other French magistrates, such as Montesquieu, Hénault (1685–1770), Des Brosses (1706–1773), and others, who made considerable mark in literature; but it was usually (except in the case of Montesquieu) in subjects not even indirectly connected with their profession. The bench and bar of France were indeed at this time almost as full of abuses as the other departments of state; and though the parliaments, metropolitan and provincial, would occasionally withstand a corrupt ministry, it was much more in the interest of their own privileges than of the community. The *Esprit des Lois* stands alone.

18th Century Criticism and Periodical Literature.—We have said that literary criticism assumes in this century a sufficient importance to be treated under a separate heading. Contributions were made to it of many different kinds and from many different points of view. Periodical literature, the chief stimulus to its production, began more and more to come into favor. Even in the 17th century the *Journal des Savants*, the Jesuit *Journal de Trévoux*, and other publications had set the example of different kinds of it. Just before the Revolution the *Gazette de France* was in the hands of Suard, a man who was nothing if not a literary critic. Perhaps, however, the most remarkable contribution of the century to criticism of the periodical kind was the *Feuilles de Grimm*, a circular sent for many years by the comrade of Diderot and Rousseau to the German courts, and containing a *compte rendu* of the ways and works of Paris, literary and artistic as well as social. These *Leaves* not only include much excellent literary criticism by Diderot, but also gave occasion to the incomparable *salons* or accounts of the exhibition of pictures from the same hand, essays which founded the art of picture criticism, and which have hardly been surpassed since. The prize competitions of the Academy were also a considerable stimulus to literary criticism, though the prevailing taste in such compositions rather inclined to elegant themes than to careful studies or analyses. Larger works on the arts in general or on special divisions of them were not wanting, as, for instance, that of Dubos before alluded to, and those of the Père Bouhours, the Abbé Trublet, and the Abbé Terrasson, the *Essai sur la Peinture* of Diderot, and others. Critically annotated editions of the great French writers also came into fashion, and were no longer written by mere pedants. Of these Voltaire's edition of Corneille was the most remarkable, and his annotations, united separately under the title of *Commentaire sur Corneille*, form not the least important portion of his works. Even older writers, looked down upon though they were by the general taste of the day, received a share of this critical interest. In the earlier portion of the century Lenglet-Dufresnoy and La Monnoye devoted their attention to Rabelais, Regnier, Villon, Marot, and others. Barbazan (1696–1774) and Le Grand d'Aussy (1737–1800) gathered and brought into notice the long scattered and unknown rather than neglected fabliaux of the Middle Ages. Even the chansons de gestes attracted the notice of the Comte de Caylus (1692–1765) and the Comte de Tressan (1705–1785). The latter, in his *Bibliothèque des Romans*, worked up a large number of the old epics into a form suited to the taste of the century. In his hands they became lively tales of the kind suited to readers of Voltaire and Crébillon. But in this travestied form they had considerable influence both in France and abroad—Wieland, for instance, writing his *Oberon* merely from a knowledge, and very soon after the appearance, of Tressan's version of *Huon de Bordeaux*. By these publications attention was at least called to early French literature, and when it had been once called, a more serious and appreciative study became merely a matter of time. The style of much of the literary criticism of the close of this period was indeed deplorable enough. Laharpe (1739–1803), who though a little later in time as to most of his critical productions is perhaps its most representative figure, shows criticism in one of its worst forms. He has all the defects of Malherbe and Boileau, with few of their merits and none of their excuses. The critic specially abhorred by Sterne, who looked only at the stop-watch, was a kind of prophecy of Laharpe; but such a writer is a natural enough expression of an expiring principle. The year after the death of Laharpe Sainte-Beuve was born.

Grimm.

18th Century Savants.—In science and general erudition the 18th century in France was at first much occupied with the mathematical studies for which the French genius is so peculiarly adapted, which the great discoveries of Descartes had made possible and popular, and which those of his supplanter Newton only made more popular still. Voltaire took to himself the credit which he fairly deserves of first introducing the Newtonian system into France, and it was soon widely popular—even ladies devoting themselves to the exposition of mathematical subjects, as in the case of the Marquise du Chatelet. Many of the greatest mathematicians of the age, such as De Moivre and Laplace, were French by birth, while others like Euler belonged to French-speaking races, and wrote in French. The physical sciences were also ardently cultivated, the impulse to them being given partly by the generally materialistic tendency of the age, partly by the Newtonian system, and partly also by the extended knowledge of the world provided by the circumnavigatory voyage of Bougainville (1729–1811), and other travels. Maupertuis (1698–1759) and La Condamine (1701–1774) made long journeys for scientific purposes, and duly recorded their experiences. The former, a mathematician and physicist of some ability but more oddity, is chiefly known to literature by the ridicule of Voltaire in the *Diatribe du Docteur Akakia*. D'Alembert (1713–1783), a great mathematician and a writer of considerable though rather academic excellence, is principally known from his connection with and introduction to the *Encyclopédie*, of which more presently. Chemistry was also assiduously cultivated, the Baron d'Holbach, among others, being a devotee thereof, and helping to advance the science to the point where, at the conclusion of the century, it was illustrated by Berthollet and Lavoisier. During all this devotion to science in its modern acceptation, the older and more literary forms of erudition were not neglected, especially by the illustrious Benedictines of the abbey of St. Maur. Calmet (1672–1757), the author of the well-known *Dictionary of the Bible*, belonged to this order, and to them also (in particular to Dom Rivet) was due the beginning of the immense *Histoire Littéraire de la France*, a work interrupted by the Revolution and long suspended, but for the last quarter of a century diligently continued. Of less orthodox names distinguished for erudition, Fréret (1688–1749), secretary of the Academy, is perhaps the most remarkable. But in the consideration of the science and learning in the 18th century from a literary point of view, there is one name and one book which require particular and, in the case of the book, somewhat extended mention. The man is Buffon (1747–1780), the book the *Encyclopédie*. The immense *Natural History* of Buffon, though not entirely his own, is a remarkable monument of the union of scientific tastes with literary ability. As has happened in many similar instances, there is in parts more literature than science to be found in it; and from the point of view of the latter, Buffon was far too careless in observation and far too solicitous of perfection of style and grandiosity of view. The style of Buffon has sometimes been made the subject of the highest eulogy, and it is at its best admirable; but one still feels in it the fault of all serious French prose in this century before Rousseau,—the presence, that is to say, of an artificial spirit rather than of natural variety and power. The *Encyclopédie*, unquestionably on the whole the most important French literary production of the century, if we except the works of Rousseau and Voltaire, was conducted for a time by Diderot and D'Alembert, afterwards by Diderot alone. It numbered among its contributors almost every Frenchman of eminence in letters. It is often spoken of as if, under the guise of an encyclopædia, it had been merely a *plaidoyer* against religion, but this is entirely erroneous. Whatever anti-ecclesiastical bent some of the articles may have, the book as a whole is simply what it professes to be, a dictionary,—that is to say, not merely an historical and critical lexicon, like those of Bayle and Moreri (indeed, history and biography were nominally excluded), but a dictionary of arts, sciences, trades, and technical terms. Diderot himself had perhaps the greatest faculty of any man that ever lived for the literary treatment in a workman-like manner of the most heterogeneous and in some cases rebellious subjects; and his untiring labor, not merely in writing original articles, but in editing the contributions of others, determined the character of the whole work. There is no doubt that it had, quite independently of any theological or political influence, an immense share in diffusing and gratifying the taste for general information by which the century which has succeeded its publication has been more distinguished than perhaps any other in history.

Buffon.

The Encyclopédie.

1789–1830.—*General Sketch.*—The period which elapsed between the outbreak of the Revolution and the accession of Charles X. has often been considered a sterile one in point of literature. As far as mere productiveness goes, this judgment is hardly correct. No class of literature was altogether neglected during these stirring five-and-thirty years, the political events of which have so engrossed the attention of posterity that it has sometimes been necessary for historians to remind us that during the height of the Terror and the final disasters of the empire the theatres were open and the booksellers' shops patronized as much or more than ever. Journalism, parliamentary eloquence and scientific writing were especially cultivated, and the former in its modern sense may also be said to have been created. But of the higher products of literature the period may justly be considered to have been somewhat barren. During the earlier part of it there is, with the exception of André Chénier, not a single name of the first or even second order of excellence. Towards the midst those of Chateaubriand (1768–1848) and Madame de Stael (1766–1817) stand almost alone; and at the close those of Courier, Béranger, and Lamartine are not seconded by any others to tell of the magnificent literary burst which was to follow the publication of *Cromwell.* Of all departments of literature, poetry proper was worst represented during this period. André Chénier was silenced at its opening by the guillotine. Le Brun and Delille, favored by an extraordinary longevity, continued to be admired and followed. It was the palmy time of descriptive poetry. Fontanes, Castel, Boisjolin, Esmenard, Berchoux, Ricard, Martin, Gudin, Cournaud, are names which chiefly survive as those of the authors of scattered attempts to turn the Encyclopædia into verse. Chénedollé (1769–1833) owes his reputation rather to amiability and to his association with men eminent in different ways, such as Rivarol and Joubert, than to any real power. Even more ambitiously, Luce de Lancival, Campenon, Dumesnil, and Parseval de Grand-Maison endeavored to write epics, and succeeded rather worse than the Chapelains and Desmarets of the 17th century. The characteristic of all this poetry was the description of everything in metaphor and paraphrase, and the careful avoidance of anything like directness of expression; and the historians of the romantic movement have collected many instances of this absurdity. Lamartine will be more properly noticed in the next division. But about the same time as Lamartine, and towards the end of the present period, there appeared a poet who may be regarded as the last important echo of Malherbe. This was Casimir Delavigne (1793–1843), the author of *Les Messéniennes*, a writer of very great talent, and, according to the measure of Rousseau and Lebrun, no mean poet. It is usual to reckon Delavigne as transitionary between the two schools, but in strictness he must be counted with the classicists. Dramatic poetry exhibited somewhat similar characteristics. The system of tragedy writing had become purely mechanical, and every act, almost every scene and situation, had its regular and appropriate business and language, the former of which the poet was not supposed to alter at all, and the latter only very slightly. Poinsinet, Laharpe, M. J. Chénier, Raynouard, De Jouy, Briffaut, Baour-Lormian, all wrote in this style. Of these Chénier (1764–1811) had some of the vigor of his brother André, from whom he was distinguished by more popular political principles and better fortune. On the other hand Ducis (1733–1816), who passes with Englishmen as a feeble reducer of Shakespeare to classical rules, passed with his contemporaries as an introducer into French poetry of strange and revolutionary novelties. Comedy, on the other hand, fared better, as, indeed, it had always fared. Fabre d'Eglantine (1755–1794) (the companion in death of Danton), Collin d'Harleville (1755–1806), Andrieux (1759–1833), Picard, Alexandre Duval, and Népomucène Lemercier (1771–1840) were the comic authors of the period, and their works have not suffered the complete eclipse of the contemporary tragedies which in part they also wrote. If not exactly worthy successors of Molière, they are at any rate not unworthy children of Beaumarchais. In romance writing there is again, until we come to Madame de Stael, a great want of originality and even of excellence in workmanship. The works of Madame de Genlis (1746–1830) exhibit the tendencies of the 18th century to platitude and noble sentiment at their worst. Madame Cottin, Madame Souza, and Madame de Krudener exhibited some of the qualities of Madame de Lafayette and more of those of Madame de Genlis. Fiévée (1767–1839), in *Le Dot de Suzette* and other works, showed some power over the domestic story; but perhaps the most remarkable work in point of originality of the time was Xavier de Maistre's (1763–1852) *Voyage autour de ma Chambre*, an attempt in quite a new style, which has been happily followed up by other writers. Turning to history we find comparatively little written at this period. Indeed, until quite its close men were too much occupied in making history to have time to write it. There is, however, a considerable body of memoir writers, especially in the earlier years of the period, and some great names appear even in history proper. Many of Sismondi's (1773–1842) best works were produced during the empire. De Barante (1782–1866), though his best known works date much later, belongs partially to this time. On the other hand, the production of philosophical writing, especially in what we may call applied philosophy, was considerable. The sensationalist views of Condillac were first continued as by Destutt de Tracy (1754–1832) and Laromiguière, and subsequently opposed, in consequence partly of a religious and spiritualist revival, partly of the influence of foreign schools of thought, especially the German and the Scotch. The chief philosophical writers from this latter point of view were Royer Collard (1763–1846), Maine de Biran (1776–1824), and Jouffroy (1796–1842). Their influence on literature, however, was altogether inferior to that of the reactionist school, of whom De Bonald (1753–1840) and Joseph de Maistre (1754–1821) were the great leaders. These latter were strongly political in their tendencies, and political philosophy received, as was natural, a large share of the attention of the time. In continuation of the work of the Philosophes, the most remarkable writer was Volney (1757–1820), whose *Ruines* are generally known. On the other hand, others belonging to that school, such as Necker and Morellet, wrote from the moderate point of view against revolutionary excesses. Of the reactionists, De Bonald is extremely royalist, and carries out in his *Législations Primitives* somewhat the same patriarchal and absolutist theories as our own Filmer, but with infinitely greater genius.

De Maistre.

As De Bonald is royalist and aristocratic, so De Maistre is the advocate of a theocracy pure and simple, with the pope for its earthly head, and a vigorous despotism for its system of government. Of theology proper there is almost necessarily little or nothing, the clergy being in the earlier period proscribed, in the latter part kept in a strict and somewhat discreditable subjection by the empire. In moralizing literature there is one work of the very highest excellence, which, though not published till long afterwards, belongs in point of composition to this period.

Joubert.

This is the *Pensées* of Joubert (1754–1824), the most illustrious successor of Pascal and Vauvenargues, and to be ranked perhaps above both in the literary finish of his maxims, and certainly above Vauvenargues in the breadth and depth of thought which they exhibit. Of science and erudition the time was fruitful. At an early period of it appeared the remarkable work of Cabanis (1757–1808), the *Rapports du Physique et du Morale de l'Homme,* a work in which physiology is treated from the extreme materialist point of view, but with all the liveliness and literary excellence of the Philosophe movement at its best. Another physiological work of great merit at this period was the *Traité de la Vie et de la Mort* of Bichat, and the example set by these works was widely followed; while in other branches of science Laplace, Lagrange, Hauy, Berthollet, etc., produced contributions of the highest value. From the literary point of view, however, the chief interest of this time is centred in two individual names, those of Chateaubriand and Madame de Stael, and three literary developments of a more or less novel character, which were all of the highest importance in shaping the course which French literature has taken since 1824. One of these developments was the reactionary movement of De Maistre and De Bonald, which in its turn largely influenced Chateaubriand, then Lamennais and Montalembert, and has been recently represented in French literature in different guises, chiefly by M. Louis Veuillot and Mgr. Dupanloup. The second and third, closely connected, were the immense advances made by parliamentary eloquence and by political writing, the latter of which, by the hand of Paul Louis Courier (1773–1825), contributed for the first time an undoubted masterpiece to French literature. The influence of the two combined has since raised journalism to even a greater pitch of power in France than in any other country. It is in the development of these new openings for literature, and in the cast and complexion which they gave to its matter, that the real literary importance of the Revolutionary period consists; just as it is in the new elements which they supplied for the treatment of such subjects that the literary value of the authors of *René* and *De l'Allemagne* mainly lies. We have already alluded to some of the beginnings of periodical and journalistic letters in France. For some time, in the hands of Bayle, Basnage, Des Maizeaux, Jurieu, Leclerc, periodical literature consisted mainly of a series, more or less disconnected, of pamphlets, with occasional extracts from forthcoming works, critical *adversaria*, and the like. Of a more regular kind were the often-mentioned *Journal de Trévoux* and *Mercure de France*, and later the *Année Littéraire* of Fréron and the like. The *Correspondance* of Grimm also, as we have pointed out, bore considerable resemblance to a modern monthly review, though it was addressed to a very few persons. Of political news there was, under a despotism, naturally very little. 1789, however, saw a vast change in this respect. An enormous efflorescence of periodical literature at once took place, and a few of the numerous journals founded in that year or soon afterwards survived for a considerable time. A whole class of authors arose who pretended to be nothing more than journalists, while many writers distinguished for more solid contributions to literature took part in the movement, and not a few active politicians contributed. Thus to the original staff of the *Moniteur*, or, as it was at first called, *La Gazette Nationale*, Laharpe, Lacretelle, Andrieux, Garat, and Ginguené were attached. Among the writers of the *Journal de Paris* André Chénier had been ranked. Fontanes contributed to many royalist and moderate journals. Guizot and Morellet, representatives respectively of the 19th and the 18th century, shared in the *Nouvelles Politiques*, while Bertin Fiévée and Geoffroy contributed to the *Journal de l'Empire*, afterwards turned into the still existing *Journal des Débats*. Of active politicians Marat (*L'Ami du Peuple*), Mirabeau (*Courrier de Provence*), Barère (*Journal des Débats et des Décrets*), Brissot (*Patriote Français*), Hébert (*Père Duchesne*), Robespierre (*Défenseur de la Constitution*), and Tallien (*La Sentinelle*) were the most remarkable who had an intimate connection with journalism. On the other hand, the type of the journalist pure and simple is Camille Desmoulins (1759–1794), one of the most brilliant, in a literary point of view, of the short-lived celebrities of the time. Of the same class were Pelletier, Durozoy, Loustalot, Royou. As the immediate daily interest in politics drooped, there were formed periodicals of a partly political and partly literary character. Such had been the *Décade Philosophique*, which counted Cabanis, Chénier, and De Tracy among its contributors, and this was followed by the *Revue Française* at a later period, which was in its turn succeeded by the *Revue des deux Mondes*. On the other hand, parliamentary eloquence was even more important than journalism during the early period of the Revolution. Mirabeau naturally stands at the head of orators of this class, and next to him may be ranked the well-known names of Malouet and Meunier among constitutionalists; of Robespierre, Marat, and Danton, the triumvirs of the Mountain; of Maury, Cazales, and the Vicomte de Mirabeau, among the royalists; and above all of the Girondist speakers Barnave, Vergniaud, and Lanjuinais. The last-named survived to take part in the revival of parliamentary discussion after the Restoration. But the permanent contributions to French literature of this period of voluminous eloquence are, as frequently happens in such cases, by no means large.

Courier.

The union of the journalist and the parliamentary spirit produced, however, in Paul Louis Courier a master of style. Courier spent the greater part of his life, tragically cut short, in translating the classics and studying the older writers of France, in which study he learnt thoroughly to despise the pseudo-classicism of the 18th century. It was not till he was past forty that he took to political writing, and the style of his pamphlets, and their wonderful irony and vigor, at once placed them on the level of the very best things of the kind. Along with Courier should be mentioned Benjamin Constant (1767–1830), who, though partly a romance writer and partly a philosophical author, was mainly a politician and an orator, besides being fertile in articles and pamphlets. Lamennais like Lamartine will best be dealt with later, and the same may be said of Béranger; but Chateaubriand and Madame de Stael must be noticed here. The former represents, in the influence which changed the literature of the 18th century into the literature of the 19th, the vague spirit of unrest and "Weltschmerz," the affection for the picturesque qualities of nature, the religious spirit occasionally turning into mysticism, and the respect sure to become more and more definite and appreciative for antiquity. He gives in short the romantic and conservative element.

Madame de Stael.

Madame de Stael, on the other hand, as became a daughter of Necker, retained a great deal of the Philosophe character and the traditions of the 18th century, especially its liberalism, its *sensibilité*, and its thirst for general information; to which, however, she added a cosmopolitan spirit, and a readiness to introduce into France the literary and social, as well as the political and philosophical, peculiarities of other countries to which the 18th century, in France at least, had been a stranger, and which Chateaubriand himself, notwithstanding his excursions into English literature, had been very far from feeling. She therefore contributed to the positive and liberal side of the future movement. Both of these remarkable persons have in their works a certain taint of what it is difficult to call by any other name than insincerity, though it is certain that there was in their case nothing consciously insincere. The 18th century, however, had left a tradition of "posing" in French literature from which these writers, two of its most distinguished children, were by no means free. The absolute literary importance of the two was very different. Madame de Stael's early writings were of the critical kind, half æsthetic half ethical, of which the 18th century had been fond, and which their titles, *Lettres sur J. J. Rousseau*, *De l'Influence des Passions*, *De la Littérature considérée dans ses rapports avec les Institutions Sociales*, sufficiently show. Her romances, *Delphine* and *Corinne*, have singularly lost their attraction in seventy years, but their influence at the time was immense. The work, however, which had really the most fertile influence was the *De l'Allemagne*, which practically opened up to the rising generation in France the till then unknown treasures of literature and philosophy, which during the most glorious half century of her literary history Germany had, sometimes on hints taken from France herself, been accumulating. The style of these various works is not of the most admirable, and in their matter there is still, as we have said, much hollow talk. But the enthusiasm which pervaded them had a powerful effect, and the indications of new sources at which this enthusiasm might satisfy itself had an effect more powerful still.

Chateaubriand.

The literary importance of Chateaubriand is far greater, while his literary influence can hardly be exaggerated. Chateaubriand's literary father was Rousseau, and his voyage to America helped to develop the seeds which Rousseau had sown. In *René* and other works of the same kind, the naturalism of Rousseau received a still further development. But it was not in mere naturalism that Chateaubriand was to find his most fertile and most successful theme. It was, on the contrary, in the rehabilitation of Christianity. The 18th century had used against religion the method of ridicule; Chateaubriand, by genius rather than by reasoning, set up against this method that of poetry and romance. "Christianity," says he, almost in so many words, "is the most poetical of all religions, the most attractive, the most fertile in literary, artistic, and social results." This theme he develops with the most splendid language, and with every conceivable advantage of style, in the *Genié du Christianisme* and the *Martyrs*. The splendor of imagination, the summonings of history and literature to supply effective and touching illustrations, analogies, and incidents, the rich coloring so different from the peculiarly monotonous and gray tones of the masters of the 18th century, and the fervid admiration for nature which were Chateaubriand's main attractions and characteristics, could not fail to have an enormous literary influence. The romantic school acknowledged, and with justice, its direct indebtedness thereto; but at the same time Chateaubriand's power of argument is perhaps weaker than that of any writer of equal eminence; and great as has been his literary following, his followers have very rarely adopted his principles.

Literature since 1830.—In dealing with the history of French literature during the last half century, a slight alteration of treatment is requisite. The subdivisions of literature have lately become so numerous, and the contributions to each have reached such an immense volume, that it is impossible to give more than cursory notice, or indeed allusion, to most of them. It so happens, however, that the purely literary characteristics of this period, though of the most striking and remarkable, are confined to a few branches of literature. The characteristic of the 19th century in France has hitherto been at least as strongly marked as that of any previous period. In the Middle Ages men of letters followed each other in the cultivation of certain literary forms for long centuries. The chanson de geste, the Arthurian legend, the roman d'aventure, the fabliau, the allegorical poem, the rough dramatic jeu, mystery, and farce, served successively as moulds into which the thought and writing impulse of generations of authors were successively cast, often with little attention to the suitableness of form and subject. The end of the 15th century, and still more the 16th, owing to the vast extension of thought and knowledge then introduced, finally broke up the old forms, and introduced the practice of treating each subject in a manner more or less appropriate to it, and whether appropriate or not, freely selected by the author. At the same time a vast but somewhat indiscriminate addition was made to the actual vocabulary of the language. The 17th and 18th centuries witnessed a process of restriction once more to certain forms and strict imitation of predecessors, combined with attention to purely arbitrary rules, the cramping and impoverishing effect of this (in Fénelon's words) being counterbalanced partly by the efforts of individual genius, and still more by the constant and steady enlargement of the range of thought, the choice of subjects, and the familiarity with other literature, both of the ancient and modern world. The literary work of the 19th century and of the great romantic movement which began in its second quarter was to repeat on a far larger scale the work of the 16th, to break up and discard such literary forms as had become useless or hopelessly stiff, to give strength, suppleness, and variety to such as were retained, to invent new ones where necessary, and to enrich the language by importations, inventions, and revivals. The result of this revolution is naturally most remarkable in the *belles lettres* and the kindred department of history. Poetry, not dramatic, has been revived; prose romance and literary criticism have been brought to a perfection previously unknown; and history has produced works more various, if not more remarkable, than at any previous stage of the language. Of all these branches we shall therefore endeavor to give some detailed account. But the services done to the language were not limited to the strictly literary branches of literature. Modern French, if it lacks, as it probably does lack, the statuesque precision and elegance of prose style to which between 1650 and 1800 all else was sacrificed, has become a much more suitable instrument for the accurate and copious treatment of positive and concrete subjects. These subjects have accordingly been treated in an abundance corresponding to that manifested in other countries, though the literary importance of the treatment has perhaps proportionately declined. We cannot even attempt to indicate the innumerable directions of scientific study which this copious industry has taken, and must confine ourselves to those which come more immediately under the headings previously adopted. In philosophy France, like other nations, has principally devoted itself to the historical side of the matter, and the names of Damiron, Jules Simon, Vacherot, Quinet, De Rémusat, and Renan must be mentioned. Victor Cousin (1792–1867), after enjoying a brief celebrity as the chief of an eclectic school, is now principally remembered as a philosophical historian and critic. Towards the latter part of his long life he quitted even this connection with philosophy, and devoted himself chiefly to the study of French history. The importance of Auguste Comte (1793–1857) is rather political and scientific than literary. We must also mention M. Taine (b. 1828), a brilliant writer, who busies himself alternately with history, philosophy, and criticism. Theology again, with the exception of Lamennais, to be mentioned hereafter, supplies no name on which we need linger except that of M. Renan (b. 1823), whose somewhat florid literary style has contributed largely to the influence of his theological ideas. Montalembert (1810–1870), an historian with a strong theological tinge, deserves notice, and among orators Lacordaire (1802–1861) and the Père Félix (b. 1810) on the Catholic side, and Athanase Coquerel (1820-1875) on the Protestant. The *Pensées* of Joubert, partly moral and partly literary, belong, in point of publication and interest, to this period, and so do the melancholy moralizings of De Sénancour (1770–1846), which have had a great influence, though on a somewhat limited circle. Political philosophy and its kindred sciences have naturally received a large share of attention. Towards the middle of the century there was a great development of socialist and fanciful theorizing on politics, with which the names of St. Simon, Fourier, Cabet, and others are connected. As political economists Bastiat, De Lavergne, Blanqui, and Chevalier may be noticed. In De Tocqueville (1805–1859) France produced a political observer of a remarkably acute, moderate, and reflective character. The name of Lerminier (1805-1857) is of wide repute for legal and constitutional writings, and that of Jomini (1779–1869) is still more celebrated as a military historian; while that of Lenormant (1801–1859) holds a not dissimilar position in archæology. With the publications devoted to physical science proper we do not attempt to meddle. Philology, however, demands a brief notice. In classical studies France has not recently occupied the position which might be expected of the country of Scaliger and Casaubon. She has, however, produced some considerable Orientalists, such as Champollion the younger, Burnouf, Silvestre de Sacy, and Stanislas Julien. In attention to the antiquities of their own country the French have been at last stimulated by the example of Germany. The foundation of Romance philology was due, indeed, to the foreigners Wolf and Diez. But early in the century, the curiosity as to the older literature of France created by Barbazan, Tressan, and others continued to extend. Méon published many unprinted fabliaux, gave the whole of the French *Renart* cycle, with the exception of *Renart le Contrefait*, and edited the *Roman de la Rose*. Fauriel and Raynouard dealt elaborately with Provençal poetry as well as partially with that of the trouvères; and the latter produced his comprehensive *Lexique Romane*. These examples were followed by many other writers, who edited manuscript works and commented on them, always with zeal and sometimes with discretion. Foremost among these must be mentioned M. Paulin Paris, who for fifty years has served the cause of old French literature with untiring energy, great literary taste, and a pleasant and facile pen. His selections from manuscripts, his *Romancero Française*, his editions of *Garin le Loherain* and *Berte aux Grans Piés*, and his *Romans de la Table Ronde* may especially be mentioned. Soon, too, the Benedictine *Histoire Littéraire*, so long interrupted, was resumed under M. Paris's general management, and has proceeded nearly to the end of the 14th century. Among its contents M. Paris's dissertations on the later chansons de gestes and the early song writers, M. Victor Le Clerc's on the fabliaux, and M. Littré's on the romans d'aventures may be specially noticed. For some time indeed the work of French editors was chargeable with a certain lack of critical and philological accuracy. This reproach, however, has recently been wiped off by the efforts of a band of young scholars, chiefly pupils of the *École des Chartes*, with MM. Gaston Paris and Paul Meyer at their head. The *Société des Anciens Textes Français* has also been formed for the purpose of publishing scholarly editions of inedited works. Yet France has as yet produced no lexicon of her older tongue to complete the admirable dictionary in which M. Littré (b. 1801), at the cost of a life's labor, has embodied the whole vocabulary of the classical French language. Meanwhile the period between the Middle Ages proper and the 17th century has not lacked its share of this revival of attention. To the literature between Villon and Regnier especial attention was paid by the early romantics, and Sainte-Beuve's *Tableau Historique et Critique de la Poésie et du Théâtre au Seizième Siècle* was one of the manifestoes of the school. Since the appearance of that work in 1828 editions with critical comments of the literature of this period have constantly multiplied, aided by the great fancy for tastefully produced works which exists among the richer classes in France; and there are probably now few countries in which works of old authors, whether in cheap reprints or in *éditions de luxe*, can be more readily procured.

Béranger.

The Romantic Movement.—It is time, however, to return to the literary revolution itself, and its more purely literary results. At the accession of Charles X. France possessed three writers, and perhaps only three, of already remarkable eminence, if we except Chateaubriand, who was already of a past generation. These three were Béranger (1780–1857), Lamartine (1790–1869), and Lamennais (1782–1854). The first belongs definitely in manner, despite his striking originality of *nuance*, to the past. He has remnants of the old periphrases, the cumbrous mythological allusions, the poetical properties of French verse. He has also the older and somewhat narrow limitations of a French poet; foreigners are for him mere barbarians. At the same time his extraordinary lyrical faculty, his excellent wit, which makes him a descendant of Rabelais and La Fontaine, and his occasional touches of pathos made him deserve and obtain something more than successes of occasion. Béranger, moreover, was very far from being the mere improvisatore which those who cling to the inspirationist theory of poetry would fain see in him. His studies in style and composition were persistent, and it was long before he attained the firm and brilliant manner which distinguishes him. Béranger's talent, however, was still too much a matter of individual genius to have great literary influence, and he formed no school.

Lamartine.

It was different with Lamartine, who was, nevertheless, like Béranger, a typical Frenchman. The *Méditations* and the *Harmonies* exhibit a remarkable transition between the old school and the new. In going direct to nature, in borrowing from her striking outlines, vivid and contrasted tints, harmony, and variety of sound, the new poet showed himself an innovator of the best class. In using romantic and religious associations, and expressing them in affecting language, he was the Chateaubriand of verse. But with all this he retained some of the vices of the classical school. His versification, harmonious as it is, is monotonous, and he does not venture into the bold lyrical forms which true poetry loves, and with which the alexandrine of Boileau could not unite itself. He has still the horror of the *mot propre;* he is always spiritualizing and idealizing, and his style and thought have a double portion of the feminine and almost flaccid softness which had come to pass for grace in French. Nevertheless the *Lac* is a poem such as had not been written in France for 200 years.

Lamennais.

The last of the trio, Lamennais, represents an altogether bolder and rougher genius. Strongly influenced by the Catholic reaction, Lamennais also shows the strongest possible influence of the revolutionary spirit. His earliest work, the *Essai sur l'Indifférence en Matière de Religion*, was a defence of the church on curiously unecclesiastical lines. It was written in an ardent style, full of illustrations, and extremely ambitious in character. The plan was partly critical and partly constructive. The first part disposed of the 18th century; the second, adopting the theory of papal absolutism which De Maistre had already advocated, proceeded to base it on a supposed universal consent, which the Church of Rome was very far from accepting as a contribution to its defence. The after history of Lamennais was perhaps not an unnatural recoil from this; but with this after history we are not concerned; it is sufficient to point out that in his prose, especially as afterwards developed in the apocalyptic *Paroles d'un Croyant*, are to be discerned many of the tendencies of the romantic school, particularly its hardy and picturesque choice of language, and the disdain of established and accepted methods which it professed. The signs of the revolution itself were, as was natural, first given in periodical literature. The feudalist affectations of Chateaubriand and the legitimists excited a sort of æsthetic affection for Gothicism, and Walter Scott became one of the most favorite authors in France. Soon was started the periodical *La Muse Française*, in which the names of Hugo, De Vigny, Deschamps, and Madame de Girardin appear. Almost all the writers in this periodical were eager royalists, and for some time the battle was still fought on political grounds. There could, however, be no special connection between classical drama and liberalism; and the liberal journal, the *Globe*, with no less a person than Sainte-Beuve among its contributors, declared definite war against classicism in the drama. Soon the question became purely literary, and the romantic school proper was born in the famous *cénacle* or clique in which Hugo was chief poet, Sainte-Beuve chief critic, and Gautier, Gerard de Nerval, Emile and Antony Deschamps, Petrus Borel, and others were officers. Alfred de Vigny and Alfred de Musset stand somewhat apart, and so does Charles Nodier (1783–1844), a versatile and voluminous writer, the very variety and number of whose works have somewhat prevented the individual excellence of any of them from having justice done to it. The objects of the school, which was at first violently opposed, so much so that certain Academicians actually petitioned the king to forbid the admission of any romantic piece at the Théâtre Français, were, briefly stated, the burning of everything which had been adored, and the adoring of everything which had been burnt. They would have no unities, no arbitrary selection of subjects, no restraints on variety of versification, no academically limited vocabulary, no considerations of artificial beauty, and, above all, no periphrastic expression. The *mot propre*, the calling of a spade a spade, was the great commandment of romanticism; but it must be allowed that what was taken away in periphrase was made up in adjectives. De Musset, who was very much of a free-lance in the contest, maintained indeed that the *differentia* of the romantic was the copious use of this part of speech. All sorts of epithets were invented to distinguish the two parties, of which *Flamboyant* and *Grisâtre* are perhaps the most accurate and expressive pair,—the former serving to denote the gorgeous tints and bold attempts of the new school, the latter the gray color and monotonous outlines of the old. The representation of *Hernani* in 1830 was the culmination of the struggle, and during great part of the reign of Louis Philippe almost all the younger men of letters in France were romantics. The representation of the *Lucrèce* of Ponsard (1814–1867) in 1846 is often quoted as the herald or sign of a classical reaction. But this was only apparent, and signified, if it signified anything, merely that the more juvenile excesses of the romantics were out of date. For forty years all the greatest men of letters of France have been on the innovating side, and all without exception, whether intentionally or not, have had their work colored by the results of the movement.

Drama and Poetry since 1830.—Although the immediate subject on which the battles of classics and romantics arose was dramatic poetry, the dramatic results of the movement have not been those of greatest value or most permanent character. The principal effect in the long run has been the introduction of a species of play called *drame*, as opposed to regular comedy and tragedy, admitting of much freer treatment than either of these two as previously understood in French, and lending itself in some measure to the lengthy and disjointed action, the multiplicity of personages, and the absence of stock characters which characterized the English stage in its palmy days. All Victor Hugo's dramatic works are of this class, and each, as it was produced or published (*Cromwell*, *Hernani*, *Marion de l'Orme*, *Le Roi s'amuse*, *Lucrèce Borgia*, *Marie Tudor*, *Ruy Blas*, and *Les Burgraves*), was a literary event, and excited the most violent discussion,—the author's usual plan being to prefix a prose preface of a very militant character to his work. A still more melodramatic variety of *drame* was that chiefly represented by Alexandre Dumas (1803–1874), whose *Henri III.* and *Antony*, to which may be added later *La Tour de Nesle* and *Mademoiselle de Belleisle*, were almost as much rallying points for the early romantics as the dramas of Hugo, despite their inferior literary value. At the same time Alexandre Soumet (1788–1845), in *Norma*, *Une Fête de Neron*, etc., and Casimir Delavigne in *Marino Faliero*, *Louis XI.*, etc., maintained a somewhat closer adherence to the older models. The classical or semi-classical reaction of the last years of Louis Philippe was represented in tragedy by Ponsard (*Lucrèce*, *Agnes de Méranie*, *Charlotte Corday*, *Ulysse*, and several comedies), and on the comic side, to a certain extent, by Emile Augier (b. 1820) in *L'Aventurière*, *Le Gendre de M. Poirier*, *Le Fils de Giboyer*, etc. During almost the whole period Eugène Scribe (1791–1861) poured forth innumerable comedies of the vaudeville order, which, without possessing much literary value, attained immense popularity. For the last twenty years the realist development of romanticism has had the upper hand in dramatic composition, its principal representatives being on the one side Victorien Sardou (b. 1831), who in *Nos Intimes*, *La Famille*, *Benoîton*, *Rabagas*, *Dora*, etc., has chiefly devoted himself to the satirical treatment of manners, and Alexandre Dumas *fils* (b. 1824), who in such pieces as *Les Idées de Madame Aubray* and *L'Étrangère* has rather busied himself with morals. Certain isolated authors also deserve notice, such as Autran (1813–1877), a poet and Academician having some resemblance to Lamartine, whose *Fille d'Æschyle* created for him a dramatic reputation which he did not attempt to follow up, and Legouvé (b. 1807), whose *Adrienne Lecouvreur* was assisted to popularity by the admirable talent of Rachel. A special variety of drama of the first literary importance has also been cultivated in this century under the title of *scènes* or *proverbes*, slight dramatic sketches, in which the dialogue and style are of even more importance than the action. The best of all of these are those of Alfred de Musset (1810–1857), whose *Il faut qu'une porte soit ouverte ou fermée*, *On ne badine pas avec l'amour*, etc., are models of grace and wit. Among his followers may be mentioned especially M. Octave Feuillet (b. 1812).

Victor Hugo.

In poetry proper, as in drama, M. Victor Hugo showed the way, and has never allowed any one since to take the lead from him. In him all the romantic characteristics are expressed and embodied,—disregard of arbitrary critical rules, free choice of subject, variety and vigor of metre, splendor and sonorousness of diction. If the careful attention to form which is also characteristic of the movement is less apparent in him than in some of his followers, it is not because it is absent, but because the enthusiastic conviction with which he attacks every subject somewhat diverts attention from it. As with the merits so with the defects. A deficient sense of the ludicrous which has characterized many of the romantics is strongly apparent in their leader, as is also an equally representative grandiosity, and a fondness for the introduction of foreign and unfamiliar words, especially proper names, which occasionally produces an effect of burlesque. Victor Hugo's earliest poetical works, his chiefly royalist and political *Odes*, are cast in the older and accepted forms, but already display astonishing poetical qualities. But it was in the *Ballades* (for instance, the splendid *Pas d'Armes du Roi Jean*, written in verses of three syllables) and the *Orientales* (of which may be taken for a sample the sixth section of *Navarin*, a perfect torrent of outlandish terms poured forth in the most admirable verse, or *Les Djinns*, where some of the stanzas have lines of two syllables each) that the grand provocation was thrown to the believers in alexandrines, careful cæsuras, and strictly separated couplets. *Les Feuilles d'Automne*, *Les Chants du Crépuscule*, *Les Voix Intérieures*, *Les Rayons et les Ombres*, the productions of the next twenty years, were quieter in style and tone, but no less full of poetical spirit. The Revolution of 1848, the establishment of the empire, and the poet's exile brought about a fresh determination of his genius to lyrical subjects. *Les Châtiments* and *La Légende des Siècles*, the one political, the other historical, reach perhaps the high water mark of French verse; and they were followed by the philosophical *Contemplations*, the lighter *Chansons des Rues et des Bois*, the *Année Terrible*, the second *Légende des Siècles*, and one or two more volumes which lead us to the present day. We have been thus particular because the literary productiveness of Victor Hugo himself has been the measure and sample of the whole literary productiveness of France on the poetical side. At five-and-twenty he was acknowledged as a master, at seventy-five he is a master still. His poetical influence has been represented in three different schools, from which very few of the poetical writers of the century can be excluded. These few we may notice first.

De Musset.

Alfred de Musset, a writer of great genius, felt part of the romantic inspiration very strongly, but was on the whole unfortunately influenced by Byron, and partly out of wilfulness, partly from a natural want of persevering industry and vigor, allowed himself to be careless and even slovenly in composition. Notwithstanding this many of his lyrics are among the finest poems in the language, and his verse, careless as it is, has extraordinary natural grace. Auguste Barbier, whose *Iambes* shows an extraordinary command of nervous and masculine versification, also comes in here; and the Breton poet Brizeux, together with Hégésippe Moreau, an unequal poet possessing some talent, and Pierre Dupont (1821–1870), one of much greater gifts, also deserve mention. Of the school of Lamartine rather than of Hugo are Alfred de Vigny (1799–1865) and Victor de Laprade (b. 1812), the former a writer of little bulk and somewhat over-fastidious, but possessing one of the most correct and elegant styles to be found in French, the latter a meditative and philosophical poet, like De Vigny an admirable writer, but somewhat deficient in pith and substance, as well as in warmth and color. The poetical schools which more directly derive from the romantic movement as represented by Hugo are three in number, corresponding in point of time with the first outburst of the movement, with the period of reaction already alluded to, and with the closing years of the second empire.

Gautier.

Of the first by far the most distinguished member was Théophile Gautier (1811–1872), the most perfect poet in point of form that France has produced. The side of the romantic movement which Gautier developed was its purely pagan and Renaissance aspect. When quite a boy he devoted himself to the study of 16th century masters, and though he acknowledged the supremacy of Hugo, his own talent was of an individual order, and developed itself more or less independently. *Albertus* alone of his poems has much of the extravagant and grotesque character which distinguished early romantic literature. The *Comédie de la Mort*, the *Poésies Diverses*, and still more the *Emaux et Camées*, display a distinctly classical tendency—classical, that is to say, not in the party and perverted sense, but in its true acceptation. The tendency to the fantastic and the horrible may be taken as best shown by Petrus Borel (1809–1859), a writer of singular power almost entirely wasted. Gerard Labrunie or de Nerval (1808–1855) adopted a manner also fantastic but more idealistic than Borel's, and distinguished himself by his Oriental travels and studies, and by his attention to popular ballads and traditions, while his style has an exquisite but unaffected strangeness hardly inferior to Gautier's. This peculiar and somewhat quintessenced style is also remarkable in the *Gaspard de la Nuit* of Louis Bertrand, a work of rhythmical prose almost unique in its character. The two Deschamps were chiefly remarkable as translators. The next generation produced three remarkable poets, to whom may perhaps be added a fourth. Théodore de Banville (b. 1820), adopting the principles of Gautier, and combining with them a considerable satiric faculty, composed a large amount of verse, faultless in form, delicate and exquisite in shades and colors, but so entirely neutral in moral and political tone that it has found comparatively few admirers. Leconte de Lisle (b. 1819), carrying out the principle of ransacking foreign literatures for subjects, has gone to Celtic, classical, or even Oriental sources for his inspiration, and despite a science in verse not much inferior to De Banville's, and a far wider range and choice of subject, has diffused an air of erudition, not to say pedantry, over his work which has disgusted some readers. Charles Baudelaire (1821–1867), by his choice of unpopular subjects and the terrible truth of his analysis, has revolted not a few of those who, in the words of an English critic, cannot take pleasure in the representation if they do not take pleasure in the thing represented. Thus by a strange coincidence each of the three representatives of the second romantic generation has for various reasons been hitherto disappointed of his due fame. The fourth poet of this time, Joséphin Soulary, is probably little known in England. His sonnets, however, are of rare beauty and excellence. In 1866 a collection of poems, entitled after an old French fashion *Le Parnasse Contemporain*, appeared. It included contributions by many of the poets just mentioned, but the mass of the contributors were hitherto unknown to fame. A similar collection appeared in 1869, and was interrupted by the German war, but continued after it, and a third in 1876. The contributors to these collections, who have mostly published separate works, were very numerous, and have become collectively known, half seriously and half in derision, as *Les Parnassiens*. From time to time aspirants to poetry, such as MM. Bouchor and Lafagette, have attempted to revolt against this society, but they have ended by being absorbed into it. The cardinal principle of the *Parnassiens* is in continuation of Gautier and Baudelaire, a devotion to poetry as an art, but under this general principle there is a considerable diversity of aim and object, and a still greater diversity of subject. François Coppée has devoted himself chiefly to domestic and social subjects. Sully Prudhomme has a certain classical tinge. Catulle Mendes has followed Leconte de Lisle in going far afield for his subjects; Louisa Siefert indulges in the poetry of despair; while Albert Glatigny, a poet who lived as a strolling actor, and died young, perhaps excelled any of the others in individuality of poetical treatment. As the *Parnassiens*, however, muster some three or four score poets, it is impossible to deal with them at length here. It is sufficient to say that the average merit of their work is decidedly high, though it is difficult to assign the first rank to any poet among them. Assuming that their work is to be classed as minor poetry, there has assuredly not even in the Elizabethan age in England been such a school of minor poets. It is fair to add that they appear to be little read in France, and hardly at all elsewhere. To complete the history of French poetry in the 19th century we must add that considerable efforts have been made to give Provençal rank once more as a literary tongue. The Gascon poet Jacques Jasmin has produced a good deal of verse in the western dialect of the language. Within the last twenty years a more cultivated and literary school of poets has arisen in Provence itself, the chief of whom are Frédéric Mistral (*Mirèio*, *Calendau*) and Théodore Aubanel.

Prose Fiction since 1830.—Even more remarkable, because more absolutely novel, was the outburst of prose fiction which followed 1830. We have said that in this department the productions of France since the discrediting of the Scudéry romances had not on the whole been remarkable, and had been produced at considerable intervals. Madame de Lafayette, Le Sage, Marivaux, Voltaire, the Abbé Prévost, Diderot, J. J. Rousseau, Benardin de St. Pierre, and Fiévée had all of them produced work excellent in its way, and comprising in a more or less rudimentary condition most varieties of the novel. But none of them had, in the French phrase, made a school, and at no time had prose fiction been composed in any considerable quantities. The immense influence which, as we have seen, Walter Scott exercised was perhaps the direct cause of the attention paid to prose fiction; the facility, too, with which all the fancies, tastes, and beliefs of the time could be embodied in such work may have had considerable importance. But it is difficult on any theory of cause and effect to account for the appearance in less than ten years of such a group of novelists as Hugo, Gautier, Dumas, Mérimée, Balzac, George Sand, Jules Sandeau, and Charles de Bernard, names to which might be added others scarcely inferior. There is hardly anything else resembling it in literature, except the great cluster of English dramatists in the beginning of the 17th century, and of English poets at the beginning of the 19th; and it is remarkable that the excellence of the first group has been maintained by a fresh generation,—Murger, About, Feuillet, Flaubert, Erckmann-Chatrian, Droz, Daudet, Cherbuliez, and Gaboriau, forming a company of *diadochi* not far inferior to their predecessors. The romance writing of France during the period has taken two different directions,—the first that of the novel of incident, the second that of analysis and character. The first, now mainly deserted, was that which, as was natural when Scott was the model, was formerly most trodden; the second required the astonishing genius of George Sand and of Balzac to attract students to it. The novels of Victor Hugo are novels of incident, with a strong infusion of purpose, and considerable but rather ideal character drawing. They are in fact lengthy prose *drames* rather than romances proper, and they have found no imitators, probably because no other genius was equal to the task. They display, however, the powers of the master at their fullest.

Dumas.

On the other hand, Alexandre Dumas originally composed his novels in close imitation of Scott, and they are much less dramatic than narrative in character, so that they lend themselves to almost indefinite continuation, and there is often no particular reason why they should terminate even at the end of the score or so of volumes to which they sometimes actually extend. Of this purely narrative kind, which hardly even attempts anything but the boldest character drawing, the best of them, such as *Vingt Ans Après*, *Les Trois Mousquetaires*, *La Reine Margot*, are probably the best specimens extant. Dumas possesses almost alone among novelists the secret of writing interminable dialogue without being tedious. Of something the same kind, but of a far lower stamp, are the novels of Eugène Sue (1804–1857). Dumas and Sue were accompanied and followed by a vast crowd of companions, independent or imitative. Alfred de Vigny had already attempted the historical novel in *Cinq-Mars*. Henri de La Touche, an excellent critic who formed George Sand, but a mediocre novelist, may be mentioned, and perhaps also Roger de Beauvoir and Frédéric Soulé. Paul Féval and Amédée Achard are of the same school, and some of the attempts of Jules Janin (1804–1874), more celebrated as a critic, may also be connected with it. By degrees, however, the taste for the novel of incident, at least of an historical kind, died out till it was revived in another form, and with an admixture of domestic interest, by MM. Erckmann-Chatrian. The last and one of the most splendid instances of the old style was *Le Capitaine Fracasse*, which Théophile Gautier wrote in his old age as a kind of *tour de force*. The last-named writer in his earlier days had modified the incident novel in many short tales, a kind of writing for which French has always been famous, and in which Gautier's sketches are masterpieces. His only other long novel, *Mademoiselle de Maupin*, belongs rather to the class of analysis. With Gautier as a writer, whose literary characteristics even excel his purely tale-telling powers, may be classed Prosper Mérimée (1803–1871), one of the most exqisite 19th century masters of the language. Already, however, in 1830 the tide was setting strongly in favor of novels of contemporary life and manners. These were of course susceptible of extremely various treatment. For many years Paul de Kock, a writer who did not trouble himself about classics or romantics or any such matter, continued the tradition of Marivaux, Crébillon *fils*, and Pigault Lebrun, in a series of not very moral or polished but lively and amusing sketches of life, principally of the bourgeois type. Later Charles de Bernard (1805–1850), with infinitely greater wit, elegance, propriety, and literary skill, did the same thing for the higher classes of French society. But the two great masters of the novel of character and manners as opposed to that of history and incident are Honoré de Balzac (1799–1850) and Aurore Dudevant, commonly called George Sand (1793–1876). Their influence affected the entire body of novelists who succeeded them, with very few exceptions. At the head of these exceptions may be placed Jules Sandeau (b. 1811), who, after writing a certain number of novels in a less individual style, at last made for himself a special subject in a certain kind of domestic novel, where the passions set in motion are less boisterous than those usually preferred by the French novelist, and reliance is mainly placed on minute character drawing and shades of color sober in hue but very carefully adjusted (*Catherine Mademoiselle de Penarvan*, *Mademoiselle de la Seiglière*). In the same class of the more quiet and purely domestic novelists may be placed X. B. Saintine (*Picciola*), Madame C. Reybaud (*Clementine*, *Le Cadet de Colobrières*), J. T. de St. Germain (*Pour un Épingle*, *La Feuille de Coudrier*), Madame Craven (*Rècit d'une Sœur*, *Fleurange*). Henri Beyle, who wrote under the *nom de plume* of Stendhal, also stands by himself. His chief work in the line of fiction is *La Chartreuse de Parme*, an exceedingly powerful novel of the analytical kind, and he also composed a considerable number of critical and miscellaneous works. Last among the independents must be mentioned Henry Murger (1822–1861), the painter of what is called Bohemian life, that is to say, the struggles, difficulties, and amusements of students, youthful artists, and men of letters. In this peculiar style, which may perhaps be regarded as an irregular descendant of the picaroon romance, Murger has no rival; and he is also, though on no extensive scale, a poet of great pathos. But with these exceptions, the influences of the two writers we have mentioned, sometimes combined, more often separate, may be traced throughout the whole of later novel literature.

G. Sand.

George Sand began with books strongly tinged with the spirit of revolt against moral and social arrangements, and she sometimes diverged into very curious paths of pseudo-philosophy, such as was popular in the second quarter of the century. At times, too, as in *Lucrezia Floriani* and some other works, she did not hesitate to draw largely on her own personal adventures and experiences. But latterly she devoted herself rather to sketches of country life and manners, and to novels involving bold if not very careful sketches of character and more or less dramatic situations. She was one of the most fertile of novelists, continuing to the end of her long life to pour forth fiction at the rate of many volumes a year. This fertility, and the inexhaustible supply of comparatively novel imaginations with which she kept it up, is one of the most remarkable characteristics of her work, and in this respect she is perhaps second only to Sir Walter Scott; but there is at the same time a certain want of finish about her fertility, and she is not generally found to be an author whose readers return to her individual works, as in the case with less productive but more laborious writers. Of her different styles may be mentioned as fairly characteristic, *Lélia*, *Lucrezia Floriani*, *Consuelo*, *La Mare au Diable*, *La Petite Fadette*, *François le Champy*, *Mademoiselle de la Quintinie*.

Balzac the younger.

Considering the shorter length of his life the productiveness of Balzac was almost more astonishing, especially if we consider that much of his early work is never reprinted, and has passed entirely out of remembrance. He is, moreover, the most remarkable example in literature of untiring work and determination to achieve success despite the greatest discouragements. His early work was, as we have said, worse than unsuccessful, it was positively bad; and even the partiality which is usually shown to the early work of a man of genius has found it impossible to reverse the verdict of his first readers. After more than a score of unsuccessful attempts, *Les Chouans* at last made its mark, and for twenty years from that time the astonishing productions composing the so-called *Comédie Humaine* were poured forth successively. The sub-titles which Balzac imposed upon the different batches, *Scènes de la Vie Parisienne*, *De la Vie de Province*, *De la Vie Intime*, etc., show like the general title a deliberate intention on the author's part to cover the whole ground of human, at least of French, life. Such an attempt could not succeed wholly; yet the amount of success attained is astonishing. Balzac has, however, with some justice been accused of creating the world which he described, and his personages, wonderful as is the accuracy and force with which many of the characteristics of humanity are exemplified in them, are somehow not altogether human, owing to the specially French fault which we noticed in Racine and Molière of insisting too much on the ruling passion. Since these two great novelists, many others have arisen, partly to tread in their steps, partly to strike out independent paths. Octave Feuillet, beginning his career by apprenticeship to Alexander Dumas and the historical novel, soon found his way in a very different style of composition, the *roman intime* of fashionable life, in which, notwithstanding some grave defects, he has attained much popularity. The so-called realist side of Balzac has been developed by Gustave Flaubert (b. 1821), who, to all his master's acuteness, and more than his knowledge of human nature, adds culture, scholarship, and a literary power over the language inferior to that of no writer of the century. *Madame Bovary* and *L'Éducation Sentimentale* are studies of contemporary life; in *Salammbô* and *La Tentation de St. Antoine* erudition and antiquarian knowledge furnish the subjects for the display of the highest literary skill. Of about the same date (b. 1828) Edmond About, before he abandoned novel-writing, devoted himself chiefly to sketches of abundant but always refined wit (*L'Homme à l'Oreille cassée, Le Nez d'un Notaire*), and sometimes to foreign scenes (*Tolla, le Roi des Montagnes*). Champfleury (b. 1821), an associate of Murger, deserves notice for stories of the extravaganza kind. During the whole of the second empire one of the most popular writers was Ernest Feydeau (1821–1874), a writer of great ability, but morbid and affected in the choice and treatment of his subjects (*Fanny, Sylvie, Catharine d'Overmeire*). In the last ten years many writers of the realist school have endeavored to outdo their predecessors in unflinching fidelity, nominally carrying out the principles of Balzac and Flaubert, but in reality rather reverting to the extravagance of the very earliest romantic school, such as that of Jules Janin in *L'Âne Mort*, and Petrus Borel in *Champavert*. Émile Zola, for instance, in parts of his long series *Les Rougon-Macquart*, descends to mere thieves' Latin and rhyparography. Émile Gaboriau, taking up that side of Balzac's talent which devoted itself to inextricable mysteries, criminal trials, and the like, produced *M. Le Coq, Le Crime d'Orcival, La Degringolade*, etc.; and Adolphe Belot for a time endeavored to out-Feydeau Feydeau in *La Femme de Feu* and other works. Of a different stamp, and less of a mere exaggerator, is Victor Cherbuliez, who has produced in *Le Roman d'une honnête Femme* a good novel of the analytic class, and in *Le comte Kostia, Ladislas Bolski*, etc., less successful romances of incident. Gustave Droz deserves praise for extraordinarily witty and finely drawn domestic sketches, and Alphonse Daudet has written novels of manners the popularity of which is too recent to allow us to judge its chances of continuance.

Periodical Literature since 1830.—Criticism.—One of the causes which led to this extensive composition of novels was the great spread of periodical literature in France, and the custom of including in almost all periodicals, daily, weekly, or monthly, a *feuilleton* or instalment of fiction. The same spread of periodical literature, together with the increasing interest in the literature of the past, led also to a very great development of criticism. Almost all French authors of any eminence during the last half century have devoted themselves more or less to criticism of literature, of the theatre, or of art, and sometimes, as in the case of Janin and Gautier, the comparatively lucrative nature of journalism and the smaller demands which it made for labor and intellectual concentration have diverted to feuilleton-writing abilities which might perhaps have been better employed. At the same time it must be remembered that from this devotion of men of the best talents to critical work has arisen an immense elevation of the standard of such work. Before the romantic movement in France Diderot in that country, Lessing and some of his successors in Germany, Hazlitt, Coleridge, and Lamb in England, had been admirable critics and reviewers. But the theory of criticism, though these men's principles and practice had set it aside, still remained more or less what it had been for centuries. The critic was merely the administrator of certain hard and fast rules. There were certain recognized kinds of literary composition; every new book was bound to class itself under one or other of these. There were certain recognized rules for each class; and the goodness or badness of a book consisted simply in its obedience or disobedience to these rules. Even the kinds of admissible subjects and the modes of admissible treatment were strictly noted and numbered. This was especially the case in France and with regard to French *belles lettres*, so that, as we have seen, certain classes of composition had been reduced to unimportant variations of a registered pattern. The romantic protest against this absurdity was specially loud and completely victorious. It is said that a publisher advised the youthful Lamartine to try "to be like somebody else" if he wished to succeed. The romantic standard of success was, on the contrary, to be as individual as possible. Victor Hugo himself composed a good deal of criticism, and in the preface to his *Orientales* he states the critical principles of the new school clearly. The critic, he says, has nothing to do with the subject chosen, the colors employed, the materials used. Is the work, judged by itself and with regard only to the ideal which the worker had in his mind, good or bad? It will be seen that as a legitimate corollary of this theorem the critic becomes even more of an interpreter than of a judge. He can no more satisfy himself or his readers by comparing the work before him with some abstract and accepted standard, and marking off its shortcomings. He has to reconstruct, more or less conjecturally, the special ideal at which each of his authors aimed, and to do this he has to study their idiosyncrasies with the utmost care, and set them before his readers in as full and attractive a fashion as he can manage. The first writer who thoroughly grasped this necessity and successfully dealt with it was Sainte-Beuve (1804–1869), who has indeed identified his name with the method of criticism just described. Sainte-Beuve's first remarkable work (his poems and novels we may leave out of consideration) was the sketch of 16th century literature already alluded to which he contributed to the *Globe*. But it was not till later that his style of criticism became fully developed and accentuated. During the first decade of Louis Philippe's reign his critical papers, united under the title of *Critiques et Portraits Littéraires*, show a gradual advance. During the next ten years he was mainly occupied with his studies of the writers of the Port Royal school. But it was during the last twenty years of his life, when the famous *Causeries du Lundi* appeared weekly in the columns of the *Constitutionnel* and the *Moniteur*, that his most remarkable productions came out. Sainte-Beuve's style of criticism (which is the key to so much of French literature of the last half century that it is necessary to dwell on it at some length), excellent and valuable as it is, lent itself to two corruptions. There is, in the first place, in making the careful investigations into the character and circumstances of each writer which it demands, a danger of paying too much attention to the man and too little to his work, and of substituting for a critical study a mere collection of personal anecdotes and traits, especially if the author dealt with belongs to a foreign country or a past age. The other danger is that of connecting the genius and character of particular authors too much with their conditions and circumstances so as to regard them as merely so many products of the age. These faults, and especially the latter, have been very noticeable in many of Sainte-Beuve's successors, particularly in M. Henri Taine, the most brilliant of living French critics, and, owing to his *Histoire de la Littérature Anglaise*, the best known in England. A large number of other critics during the period deserve notice because they have, though acting more or less on the newer system of criticism, manifested considerable originality in its application. As far as merely critical faculty goes, and still more in the power of giving literary expression to criticism, Théophile Gautier yields to no one. His *Les Grotesques*, an early work dealing with Villon, De Viau, and other *enfants terribles* of French literature, has served as a model to many subsequent writers, such as Charles Monselet and Charles Asselineau, the affectionate historian of the less famous promoters of the romantic movement. On the other hand, Gautier's picture criticisms, and his short reviews of books, obituary notices, and other things of the kind contributed to daily papers, are in point of style among the finest of all such fugitive

Sainte-Beuve.

compositions. Janin, chiefly a theatrical critic, excelled in light and easy journalism, but his work has neither weight of substance nor careful elaboration of manner sufficient to give it permanent value. This sort of light critical comment has become almost a specialty of the French press, and among its numerous practitioners the names of Armand de Pontmartin (an imitator and assailant of Sainte-Beuve), Arsène Houssaye, Fiorentino, may be mentioned. Edmond Scherer and Paul de St. Victor—the former of whom was born in 1812, the latter in 1827—represent different sides of Sainte-Beuve's style in literary criticism; and in theatrical censure Francisque Sarcey, an acute but somewhat severe judge, has succeeded to the good-natured sovereignty of Janin. The criticism of the *Revue des Deux Mondes* has played a sufficiently important part in French literature to deserve separate notice in passing. Founded in 1829, the *Revue*, after some vicissitudes, soon attained, under the direction of the Swiss Buloz, the character of being one of the first of European critical periodicals. Its style of criticism has on the whole inclined rather to the classical side,—that is, to classicism as modified by, and possible after, the romantic movement. Besides some of the authors already named, its principal critical contributors have been Gustave Planche, an acute but somewhat truculent critic, Henri Étienne, St. René Taillandier. Lastly we must notice the important section of professorial or university critics, whose critical work has taken the form either of regular treatises or of courses of republished lectures, books somewhat academic and rhetorical in character, but often representing an amount of influence which has served largely to stir up attention to literature. The most prominent name among these is that of Villemain (1790–1870), who was one of the earliest critics of the literature of his own country that obtained a hearing out of it. M. Nisard (b. 1806) has perhaps been more fortunate in his dealings with Latin than with French, and in his *History* of the latter literature represents too much the classical tradition; Alexandre Vinet (1797–1847), a Swiss critic of considerable eminence, Saint-Marc-Girardin (1801–1873), whose *Course de Littérature Dramatique* is his chief work, and Eugène Géruzez (1799–1865), who is the author not only of an extremely useful and well-written handbook to French literature before the Revolution, but also of other works dealing with separate portions of the subject, must also be mentioned.

History since 1830.—The remarkable development of historical studies which we have noticed as taking place under the Restoration was accelerated and intensified in the reigns of Charles X. and Louis Philippe. Both the scope and the method of the historian underwent a sensible alteration. For something like 150 years historians had been divided into two classes, those who produced elegant literary works pleasant to read, and those who produced works of laborious erudition, but not even intended for general perusal. The Vertots and Voltaires were on one side, the Mabillons and Tillemonts on another. Now, although the duty of a French historian to produce works of literary merit was not forgotten, it was recognized as part of that duty to consult original documents and impart original observation. At the same time, to the merely political events which had formerly been recognized as forming the historian's province were added the social and literary phenomena which had long been more or less neglected. Old chronicles and histories were re-read and re-edited; innumerable monographs on special subjects and periods were produced, and these latter were of immense service to romance writers at the time of the popularity of the historical novel. Not a few of the works, for instance, which were signed by Alexandre Dumas consist mainly of extracts or condensations from old chronicles, or modern monographs ingeniously united by dialogue and varnished with a little description. History, however, had not to wait for this second-hand popularity, and its cultivators had fully sufficient literary talent to maintain its dignity. Sismondi, whom we have already noticed, continued during this period his great *Histoire des Français*, and produced his even better known *Histoire des Republiques Italiennes au Moyen Age*. The brothers Thierry devoted themselves to early French history, Amédée Thierry (1787–1873) producing a *Histoire des Gaulois* and other works concerning the Roman period, and Augustin Thierry (1795–1856) the well-known history of the Norman Conquest, the equally attractive *Récits des Temps Mérovingiens*, and other excellent works. Philippe de Ségur (1780–1875) gave a history of the Russian campaign of Napoleon, and some other works chiefly dealing with Russian history. The voluminous *Histoire de France* of Henri Martin (b. 1810) is perhaps the best and most impartial work dealing in detail with the whole subject. De Barante, after beginning with literary criticism, turned to history, and in his *Histoire des Ducs de Bourgogne* produced a work of capital importance. As was to be expected, many of the most brilliant results of this devotion to historical subjects consisted of works dealing with the French Revolution. No series of historical events has ever perhaps received treatment at the same time from so many different points of view, and by writers of such varied literary excellence, among whom it must, however, be said that the purely royalist side is hardly at all represented. One of the earliest of these histories is that of Mignet (b. 1796), a sober and judicious historian of the older school. About the same time was begun the brilliant work of M. Thiers (1797–1877) on the Revolution, which established the literary reputation of the future president of the French republic, and was at a later period completed by the *Histoire du Consulat et de l'Empire.* The downfall of the July monarchy and the early years of the empire witnessed the publication of several works of the first importance on this subject. De Barante contributed histories of the Convention and the Directory, but the three books of greatest note were those of Lamartine, Michelet (1798–1873), and Louis Blanc (b. 1813). Lamartine's *Histoire des Girondins* is written from the constitutional republican point of view, and is sometimes considered to have had much influence in producing the events of 1848. It is, perhaps, rather the work of an orator and poet than of an historian. The work of Michelet is of a more original character. Besides his history of the Revolution, Michelet wrote an extended history of France, and a very large number of smaller works on historical, political, and social subjects. His imaginative powers are of the highest order, and his style stands alone in French for its strangely broken and picturesque character, its turbid abundance of striking images, and its somewhat sombre magnificence, qualities which, as may easily be supposed, found full occupation in a history of the Revolution. The work of Louis Blanc is that of a sincere but ardent republican, and is useful from this point of view, but possesses no extraordinary literary merit. The principal contributions to the history of the Revolution during the last twenty years are those of Quinet, Lanfrey, and Taine. Edgar Quinet (1803–1875), like Louis Blanc a devotee of the Republic and an exile for its sake, brought to this one of his latest works a mind and pen long trained to literary and historical studies; but *La Révolution* is not considered his best work. P. Lanfrey devoted himself with extraordinary patience and acuteness to the destruction of the Napoleonic legend, and the setting of the character of Napoleon I. in a new, authentic, and very far from favorable light. Quite recently M. Taine, after distinguishing himself, as we have mentioned, in literary criticism (*Histoire de la Littérature Anglaise*), and attaining less success in philosophy (*De l'Intelligence*), has begun an elaborate discussion of the Revolution, its causes, character, and consequences, which has excited some commotion among the more ardent devotees of the principles of '89. To return from this group, we must notice Michaud (1767–1839), the historian of the crusades, and Guizot (1787–1876), who, like his rival Thiers, devoted himself much to historical study. His earliest works were literary and linguistic, but he soon turned to political history, and for the last half-century of his long life his contributions to historical literature were almost incessant and of the most various character. The most important are the histories *Des Origines du Gouvernement Représentatif*, *De la Révolution d'Angleterre*, *De la Civilisation en France*, and latterly a *Histoire de France*, which he was writing at the time of his death. Among minor historians of the century may be mentioned Duvergier de Hauranne (*Gouvernement Parlementaire en France*), Mignet (*Histoire de Marie Stuart*), Ampère (*Histoire Romaine à Rome*), Beugnot (*Destruction du Paganisme d'Occident*), Haussonville (*La Réunion de la Lorraine à la France*), Vaulabelle (*Les Deux Restaurations*).

Summary and Conclusion.—We have in these last pages given such an outline of the 19th century literature of France as seemed convenient for the completion of what has gone before. It has been already remarked that the nearer approach is made to our own time the less is it possible to give exhaustive accounts of the individual cultivators of the different branches of literature. It may be added, perhaps, that such exhaustiveness becomes, as we advance, less and less necessary, as well as less and less possible. The individual *Parnassien* may and does produce work that is in itself of greater literary value than that of the individual trouvère. As a matter of literary history his contribution is less remarkable because of the examples he has before him and the circumstances which he has around him. Yet we have endeavored to draw such a sketch of French literature from the *Chanson de Roland* to the *Légende des Siècles* that no important development, and hardly any important partaker in such development, should be left out. A few lines may, perhaps, be now profitably given to summing up the aspects of the whole, remembering always that, as in no case is generalization easier than in the case of the literary aspects and tendencies of periods and nations, so in no case is it apt to be more delusive unless corrected and supported by ample information of fact and detail.

At the close of the 11th century and at the beginning of the 12th we find the vulgar tongue in France not merely in fully organized use for literary purposes, but already employed in most of the forms of poetical writing. An immense outburst of epic and narrative verse has taken place, and lyrical poetry, not limited as in the case of the epics to the north of France, but extending from Roussillon to the Pas de Calais, completes this. The 12th century adds to these earliest forms the important development of the mystery, extends the subjects and varies the manner of epic verse, and begins the compositions of literary prose with the chronicles of St. Denis and of Villehardouin, and the prose romances of the Arthurian cycle. All this literature is so far connected purely with the knightly and priestly orders, though it is largely composed and still more largely dealt in by classes of men, trouvères and jongleurs, who are not necessarily either knights or priests, and in the case of the jongleurs are certainly neither. With a possible ancestry of Romance and Teutonic *cantilenæ*, Breton *lais*, and vernacular legends, the new literature has a certain pattern and model in Latin and for the most part ecclesiastical compositions. It has the sacred books and the legends of the saints for examples of narrative, the rhythm of the hymns for a guide to metre, and the ceremonies of the church for a stimulant to dramatic performance. By degrees also in this 12th century forms of literature which busy themselves with the unprivileged classes begin to be born. The fabliau takes every phase of life for its subject; the folk-song acquires elegance and does not lose raciness and truth. In the next century, the 13th, mediæval literature in France arrives at its prime—a prime which lasts until the first quarter of the 14th. The early epics lose something of their savage charms, the polished literature of Provence quickly perishes. But in the provinces which speak the more prevailing tongue nothing is wanting to literary development. The language itself has shaken off all its youthful incapacities, and, though not yet well adapted for the requirements of modern life and study, is in every way equal to the demands made upon it by its own time. The dramatic germ contained in the fabliau and quickened by the mystery produces the profane drama. Ambitious works of merit in the most various kinds are published; *Aucassin et Nicolette* stands side by side with the *Vie de Saint Louis*, the *Jeu de la Feuillie* with *Le Miracle de Théophile*, the *Roman de la Rose* with the *Roman du Renart.* The earliest notes of ballade and rondeau are heard; endeavors are made with zeal, and not always without understanding, to naturalize the wisdom of the ancients in France, and in the graceful tongue that France possesses. Romance in prose and verse, drama, history, songs, satire, oratory, and even erudition, are all represented and represented worthily. Meanwhile all nations of Western Europe have come to France for their literary models and subjects, and the greatest writers in English, German, Italian, content themselves with adaptations of Chrétien de Troyes, of Benoit de Ste. More, and of a hundred other known and unknown trouvères and fabulists. But this age does not last long. The language has been put to all the uses of which it is as yet capable; those uses in their sameness begin to pall upon reader and hearer; and the enormous evils of the civil and religious state reflect themselves inevitably in literature. The old forms die out or are prolonged only in half-lifeless travesties. The brilliant coloring of Froissart, and the graceful science of ballade and rondeau writers like Lescurel and Deschamps, alone maintain the literary reputation of the time. Towards the end of the 14th century the translators and political writers import many terms of art, and strain the language to uses for which it is as yet unhandy, though at the beginning of the next age Charles d'Orléans by his natural grace and the virtue of the forms he used, emerges from the mass of writers. Throughout the 15th century the process of enriching or at least increasing the vocabulary goes on, but as yet no organizing hand appears to direct the process. Villon stands alone in merit as in peculiarity. But in this time dramatic literature and the literature of the floating popular broadsheet acquire an immense extension—all or almost all the vigor of spirit being concentrated in the rough farce and rougher lampoon, while all the literary skill is engrossed by insipid *rhétoriqueurs* and pedants. Then comes the grand upheaval of the Renaissance and the Reformation. An immense influx of science, of thought to make the science living, of new terms to express the thought, takes place, and a band of literary workers appear of power enough to master and get into shape the turbid mass. Rabelais, Amyot, Calvin, and Herberay fashion French prose; Marot, Ronsard, and Regnier refashion French verse. The Pléiade introduces the drama as it is to be and the language that is to help the drama to express itself. Montaigne for the first time throws invention and originality into some other form than verse or than prose fiction. But by the end of the century the tide has receded. The work of arrangement has been but half done, and there are no master spirits left to complete it. At this period Malherbe and Balzac make their appearance. Unable to deal with the whole problem, they determine to deal with part of it, and to reject a portion of the riches of which they feel themselves unfit to be stewards. Balzac and his successors make of French prose an instrument faultless and admirable in precision, unequalled for the work for which it is fit, but unfit for certain portions of the work which it was once able to perform. Malherbe, seconded by Boileau, makes of French verse an instrument suited only for the purposes of the drama of Euripides, or rather of Seneca, with or without its chorus, and for a certain weakened echo of those choruses, under the name of lyrics. No French verse of the first merit other than dramatic is written for two whole centuries. The drama soon comes to its acme, and during the succeeding time usually maintains itself at a fairly high level until the death of Voltaire. But prose lends itself to almost everything that is required of it, and becomes constantly a more and more perfect instrument. To the highest efforts of pathos and sublimity its vocabulary and its arrangement likewise are still unsuited, though the great preachers of the 17th century do their utmost with it. But for clear exposition, smooth and agreeable narrative, sententious and pointed brevity, witty repartee, it soon proves itself to have no superior and scarcely an equal in Europe. In these directions practitioners of the highest skill apply it during the 17th century, while during the 18th its powers are shown to the utmost of their variety by Voltaire, and receive a new development at the hands of Rousseau. Yet, on the whole, it loses during this century. It becomes more and more unfit for any but trivial uses, and at last it is employed for those uses only. Then occurs the Revolution, repeating the mighty stir in men's minds which the Renaissance had given, but at first experiencing more difficulty in breaking up the ground and once more rendering it fertile. The faulty and incomplete genius of Chateaubriand and De Stael gives the first evidence of a new growth, and after many years the romantic movement completes the work. The force of that movement is now, after fifty years, all but spent, though its results remain; and France in a literary point of view occupies a position not very dissimilar to that which she occupied at the extreme end of the 16th century, save that the greatest of her regenerators is yet alive. The poetical power of French has been once more triumphantly proved, and its productiveness in all branches of literature has been renewed, while in that of prose fiction there has been almost created a new class of composition. In the process of reform, however, not a little of the finish of French prose style has been lost, and the language itself has been affected in something the same way as it was affected by the less judicious innovations of the Ronsardists. The pedantry of the Pléiade led to the preposterous compounds of Du Bartas; the passion of the Romantics for foreign tongues and for the *mot propre* has loaded French with foreign terms on the one hand and with *argot* on the other. There is, therefore, room for new Malherbes and Balzacs, if the days for Balzacs and Malherbes had not to all appearance passed. Should they be once more forthcoming, they have the failure as well as the success of their predecessors to guide them.

Finally, we may sum up even this summary. For volume and merit taken together the product of these eight centuries of literature excels that of any European nation, though for individual works of the supremest excellence they may perhaps be asked in vain. No French writer is lifted by the suffrages of other nations—the only criterion when sufficient time has elapsed—to the level of Homer, of Shakespeare, or of Dante, who reign alone. Of those of the authors of France who are indeed of the thirty but attain not to the first three Rabelais and Molière alone unite the general suffrage, and this fact roughly but surely points to the real excellence of the literature which these men are chosen to represent. It is great in all ways, but it is greatest on the lighter side. The house of mirth is more suited to it than the house of mourning. To the latter, indeed, the language of the unknown marvel who told Roland's death, of him who gave utterance to Camilla's wrath and despair, and of the living poet who sings how the mountain wind makes mad the lover who cannot forget, has amply made good its title of entrance. But for one Frenchman who can write admirably in this strain there are a hundred who can tell the most admirable story, formulate the most pregnant reflection, point the acutest jest. There is thus no really great epic in French, few great tragedies, and those imperfect and in a faulty kind, little prose like Milton's or like Jeremy Taylor's, little verse (though more than is generally thought) like Shelley's or like Spenser's. But there are the most delightful short tales, both in prose and in verse, that the world has ever seen, the most polished jewelry of reflection that has ever been wrought, songs of incomparable grace, comedies that must make men laugh as long as they are laughing animals, and above all such a body of narrative fiction, old and new, prose and verse, as no other nation can show for art and for originality, for grace of workmanship in him who fashions, and for certainty of delight to him who reads.

Bibliography.—The bibliography of such a subject as French literature cannot be dealt with here exhaustively. We shall, however, indicate the principal works on the subject, and its subdivisions, which will serve to fill up the outline of the foregoing pages. On the general subject there is no work in English of any extent, except the recent compilation of Mr. H. Van Laun (Edinburgh). Notices more or less detailed of the earlier periods will be found in Hallam's works, and of the 17th and 18th centuries (which must, however, be read with great caution) in Buckle's *History of Civilization in Europe*. The chief English critical periodicals will supply monographs, though until recently in no great abundance, of the chief names and some of the chief forms. Mr. Besant's *French Poets* and *French Humorists* may be noticed.

In French the chief works on the whole subject are that of Géruzez, already noticed, and another by Demogeot. These works are both excellent, and being composed on different plans, they may with advantage be read together. They are chiefly deficient with regard to the earliest and latest literature.

For the literature of the Middle Ages the fountain-head is the ponderous *Histoire Littéraire* already referred to, which, notwithstanding that it extends to 27 quarto volumes, and has occupied, with interruptions, 150 years in publication, has only reached the 14th century. Many of the monographs which it contains are the best authorities on their subjects, such as that of M. P. Paris on the early chansonniers, of M. V. Leclerc on the fabliaux, and of M. Littré on the romans d'aventures. For the history of literature before the 11th century, the period mainly Latin, J. J. Ampère's *Histoire Littéraire de la France avant Charlemagne, sous Charlemagne, et jusqu'au onzième siècle* is the chief authority. Léon Gautier's *Épopées Françaises* (4 vols., but now reprinting on a still larger scale) contains almost everything known concerning the chansons de gestes. M. P. Paris's *Romans de la Table Ronde* is the main authority for this subject, though it does not include the contributions of Chrétien de Troyes. On the cycle of Reynard the standard work is Rothe, *Les Romans du Renart*. All parts of the lighter literature of old France are excellently treated by M. Lenient, *Le Satire au Moyen Âge*. The early theatre has been frequently treated by the brothers Parfaict (*Histoire du Théâtre Français*), by Fabre (*Les Clercs de la Bazoche*), by Leroy (*Étude sur les Mystères*), by Aubertin (*Histoire de la Langue et de la Littérature Française au Moyen Âge*). This latter book, recently completed, will be found a useful summary of the whole mediæval period. The historical, dramatic, and oratorical sections are especially full.

On the 16th century an excellent handbook has recently been written by MM. Darmesteter and Hatzfeld. Sainte-Beuve's *Tableau* has been more than once referred to. Ebert (*Entwicklungsgeschichte der Französischen Tragödie vornehmlich im* 16^{ten} *Jahrhundert*) is the chief authority for dramatic matters. The various editions of the great authors of this and other periods do not need special reference. For Provençal the most convenient and trustworthy handbook is Karl Bartsch, *Grundriss zur Geschichte der Provenzalischen Literatur*. In English, Dr. Hueffer's *Troubadours* is the only work of value.

The 17th century, as the supposed classical age, has been repeatedly treated in French. We may mention Sainte-Beuve's *Studies on Port Royal*, Demogeot's *Tableau du* 17^{eme} *Siècle avant Corneille*, and Géruzez (*Essais d'Histoire Littéraire*). Godefroy's *Histoire de la Litt. Française depuis le* 16^{eme} *Siècle jusqu'a nos jours* is an important work, as yet carried no further than the Revolution.

On the 18th century we may mention, in English, Mr. Carlyle's essays on Voltaire and Diderot, and Mr. John Morley's elaborate and exhaustive works on Voltaire, Diderot, and Rousseau, with his smaller essays on Turgot, Vauvenargues, etc. In French, the works of Vinet, Godefroy, and Villemain, and for the philosophical side Damiron, may be consulted. The best work on the period, in a small compass, is, however, a *Tableau* which M. Godefroy has published in addition to his larger work. Post-Revolution literature is as yet too recent to have been treated in works of sufficient comprehension to be noticed here. We may, however, mention Géruzez, *Littérature de la Révolution*, and Nettement, *Littérature Française sous la Restauration et la Monarchie de Juillet*.

On the subject of popular poetry, which, though a contrary impression appears to prevail in England, is of extreme importance in French literature, the main authorities are,—for the Breton district, M. Luzel (*Chants Populaires de la Basse-Bretagne*), (the more famous works of M. de la Villemarqué, *Barsaz-Breiz* and others, are of doubtful trustworthiness); for those of Lorraine, M. de Puymaigre; for those of Champagne, M. Tarbé. M. Haupt's *Französische Volkslieder*, Gaston Paris's *Chansons du* 15^{eme} *Siècle*, Wackernagel's *Alt-Französische Lieder und Leiche*, and Bartsch's *Romanzen und Pastourellen* may also be consulted, though rather for specimens than for comment. (G. S. A.)

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FRANCE, ISLE OF. See MAURITIUS.

FRANCESCA. See PIETRO DELLA FRANCESCA.

FRANCESCHINI, BALDASSARE (1611–1689), a painter of the Tuscan school, named, from Volterra the place of his birth, Il Volterrano, or (to distinguish him from Ricciarelli) Il Volterrano Giuniore, was the son of a sculptor in alabaster. At a very early age he learned from Cosimo some of the elements of art, and he started as an assistant to his father. This employment being evidently below the level of his talents, the Marquises Inghirami placed him, at the age of sixteen, under the Florentine painter Matteo Rosselli. In the ensuing year he had advanced sufficiently to execute in Volterra some frescoes, skilful in foreshortening, followed by other frescoes for the Medici family in the Valle della Petraia. In 1652 the Marchese Filippo Niccolini, being minded to employ Franceschini upon the frescoes for the cupola and back-wall of his chapel in S. Croce, Florence, despatched him to various parts of Italy to perfect his style. The painter, in a tour which lasted some months, took more especially to the qualities distinctive of the schools of Parma and Bologna, and in a measure to those of Pietro da Cortona, whose acquaintance he made in Rome. He then undertook the paintings commissioned by Niccolini, which constitute his most noted performance, the design being good, and the method masterly. Franceschini ranks higher in fresco than in oil painting. His works in the latter mode were not unfrequently left unfinished, although numerous specimens remain, the cabinet pictures being marked by much sprightliness of invention. Among his best oil paintings of large scale is the St. John the Evangelist in the church of S. Chiara at Volterra. One of his latest works was the fresco of the cupola of the Annunziata, which occupied him for two years towards 1683, a production of much labor and energy. Franceschini died of apolexy at Volterra on 6th January, 1689. He is reckoned among those painters of the decline of art to whom the general name of "machinist" is applied. He is not to be confounded with another Franceschini of the same class, and of rather later date, also of no small eminence in his time—the Cavaliere Marcantonio Franceschini, who was a Bolognese (1648–1729).

FRANCHE COMTÉ, from 1674 till the great Revolution one of the provinces of France, was bounded on the E. by the principality of Montbéliard or Mömpelgard and Switzerland, S. by Bresse, Bugey, and Gex, N. by Lorraine, and W. by the duchy of Burgundy and Champagne. It lay to the west of the Jura, and included the valley of the upper Saône and the greater part of the valley of the Doubs. In earlier history it is usually called the countship of Burgundy or Upper Burgundy; in later French history, on the other hand, it is frequently mentioned as the countship (la Comté) *par excellence.* The countship probably took its rise in the 10th century as a fief of the kingdom of Burgundy, which was dependent on the empire. It was held in the beginning of the 11th by Otto William, the warlike son of the king of the Lombards; his son and successor Reinhold or Reinaud I. ventured to refuse his homage to his suzerain Henry III., and his example was followed about a century afterwards by Reinhold III., who took up a position of independence against the emperor Lothar. In neither case was the attempt to throw off the yoke permitted to succeed, but on the latter occasion at least the prestige of the countship was improved, and according to one theory the honorable title of Free Countship (*Freigrafschaft*) was then acquired. After Lothar's death Reinhold again refused homage to the emperor Conrad, and though the emperor consequently bestowed his countship on Conrad of Zähringen, Reinhold was still in actual possession at his death in 1148. His daughter and heiress Beatrix was married to Frederick Barbarossa in 1156; and on her decease in 1185 Frederick bestowed the countship on his third son Otto, and raised Besançon to the rank of a free imperial city. Otto's daughter Beatrix married Duke Otto of Meran, and was succeeded first by their son Otto and afterwards by their daughter Alix. Otto, the son of Alix, offended the emperor Rudolph I., and his city Besançon was consequently besieged by the imperial troops in 1289; but it made a successful defence, and peace was soon afterwards concluded. A treaty was made with Philip the Fair of France, by which Otto's daughter Johanna was to marry Philip of Poitiers the king's second son, and the suzerainty of France was to be recognized by Franche Comté. The marriage took place in due course in 1307, and the importance attached by the king to his claims on Franche Comté is shown by the leniency with which the charges against the princess Johanna or Jeanne were enforced when her sisters-in-law were degraded and imprisoned and their paramours tortured and executed. On Philip's death in 1322 the countship passed to Otto IV., duke of Burgundy, and it was successively held by Philip de Rouvre, Margaret of France, Louis de Male, and Charles the Bold. On Charles's death, Louis XI. of France claimed the protectorate "for the good of the country and the lady of Burgundy, and in favor of the marriage of the dauphin with that lady." By feudal law the countship still held of the empire, being a German and a female fief; but the states accepted the French protection (February, 1477), and the claims of Maximilian were appeased by the promise of the hand of Charles of France for his daughter Margaret. In April, however, a rebellion broke out; the emperor recalled the people to their allegiance, and the Swiss hastened to support the popular cause. The French were constrained to withdraw; but in 1479 the Sire de Chaumont invaded the country, captured Dôle in spite of a vigorous defence, in which the students of the university displayed a desperate but resultless valor, and forced the people to submit. Besançon, the free imperial city, recognized the French king on the same conditions which it had demanded from the dukes of Burgundy, and promised to pay over half the product of its taxes. The parliament of Dôle was transferred to Salins, and the university to Besançon. When Charles VIII. refused to marry Maximilian's daughter, the people of Franche Comté rose in revolt, and the king relinquished his claims by the treaty of Senlis, May 23, 1493. Along with the rest of the domains of the house of Burgundy the countship was bestowed on Philip, Maximilian's son, and passed to the crown of Spain. As a Spanish territory its position was a peculiar and isolated one; and it was consequently treated with great leniency by the Spanish Government. It paid a "gratuitous gift" of not more than 200,000 livres every three years, and furnished very few soldiers to the royal army. Under the nominal authority of the governor-general of the Low Countries, it was practically governed by the parliament of Dôle and a governor chosen from the ranks of its own nobility. In 1668 Louis XIV. cast his eyes on the province, and Condé effected its conquest in fifteen days. On the 14th of February the king swore at Dôle to preserve the liberties of the town and province as count palatine of Burgundy, and the parliament issued an edict against those who refused to submit to his authority. By the peace of Aix-la-Chapelle, which almost immediately followed, Franche Comté was restored to Spain; but in 1674 Louis made a new invasion. Besançon was taken after a lengthened siege, at which Vauban and the king were both personally present; Dôle shared the same fate; and by the 4th of July the whole country was again in the hands of the French. To celebrate the conquest the triumphal arch of the Saint Martin gate at Paris was erected. The countship now became a French province; its gratuitous donation became a regular impost, which was soon after increased in amount; and the chief authority was placed in the hands of a governor-general. Instead of three great bailiwicks, as formerly, there were four:—Amont, Aval, Besançon, and Dôle—their chief towns being Vesoul, Salins, Besançon, and Dôle. See Clerc, *Histoire de la Franche Comté*.

FRANCHISE, in law, means some right or privilege, of a local or exclusive character, *e.g.*, the right of free fishery. The term is more particularly applied to the right of voting at an election for a member of parliament. See PARLIAMENT.

FRANCIA, a celebrated Bolognese painter was born towards 1450, and died 6th January, 1517. His real name was Francesco Raibolini, his father being Marco di Giacomo Raibolini, a carpenter; he was apprenticed to a goldsmith named Francia, and from him probably he got the nickname whereby he is generally known; he, moreover, studied design under Marco Zoppo. The youth was thus originally a goldsmith, and also an engraver of dies and niellos, and in these arts he became extremely eminent. He was particularly famed for his dies for medals; he rose to be mint-master at Bologna, and retained that office till the end of his life. A famous medal of Pope Julius II. as liberator of Bologna is ascribed to his hand, but not with certainty. At a mature age—having first, it appears, become acquainted with Mantegna—he turned his attention to painting. His earliest known picture is dated 1494 (not 1490, as ordinarily stated). It shows so much mastery that one is compelled to believe that Raibolini must before then have practised painting for some few years. This work is now in the Bologna gallery,—the Virgin enthroned, with Augustine and five other saints. It is an oil picture, and was originally painted for the church of S. Maria della Misericordia, at the desire of the Bentivoglio family, the rulers of Bologna. The same patrons employed him upon frescoes in their own palace; one of Judith and Holophernes is especially noted, its style recalling that of Mantegna. Francia probably studied likewise the works of Perugino; and he became a friend and ardent admirer of Raphael, to whom he addressed an enthusiastic sonnet. Raphael cordially responded to the Bolognese master's admiration, and said, in a letter dated in 1508, that few painters or none had produced Madonnas more beautiful, more devout, or better portrayed than those of Francia. If we may trust Vasari—but it is difficult to suppose that he was entirely correct—the exceeding value which Francia set on Raphael's art brought him to his grave. Raphael had consigned to Francia his famous picture of St. Cecilia, destined for the church of S. Giovanni in Monte, Bologna; and Francia, on inspecting it, took so much to heart his own inferiority, at the advanced age of about sixty-six, to the youthful Umbrian, that he sickened and shortly expired. Distanced though he may have been by Raphael, Francia is rightly regarded as the greatest painter of the earlier Bolognese school, and hardly to be surpassed as representing the art termed "anticomoderno," or of the "quattrocento." It has been well observed that his style is a medium between that of Perugino and that of Giovanni Bellini; he has somewhat more of spontaneous naturalism than the former, and of abstract dignity in feature and form than the latter. The magnificent portrait in the Louvre of a young man in black, of brooding thoughtfulness and saddened profundity of mood, would alone suffice to place Francia among the very great masters, if it could with confidence be attributed to his hand, but in all probability its real author was Franciabigio; it had erewhile passed under the name of Raphael, of Giorgione, or of Sebastian del Piombo. The London National Gallery contains two remarkably fine specimens of Francia, once combined together as principal picture and lunette,—the Virgin and Child and St. Anne enthroned, surrounded by saints, and (in the lunette) the Pietà, or lamentation of angels over the dead Saviour. They come from the Buonvisi chapel in the church of S. Frediano, Lucca. Other leading works are—in Munich, the Virgin sinking on her knees in adoration of the Divine Infant, who is lying in a garden within a rose trellis; in the Borghese Gallery, Rome, a Peter Martyr; in Bologna, the frescoes in the church of St. Cecilia, illustrating the life of the saint, all of them from the design of Raibolini, but not all executed by himself; a public passage now traverses these frescoes, and they are in a pitiful state of decay. His landscape backgrounds are of uncommon excellence. Francia had more than 200 scholars. Marcantonio Raimondi the famous engraver is now the most renowned of them; next to him, the painter Lorenzo Costa; also Amico Aspertini, and Francia's own son Giacomo, and his cousin Julio.

FRANCIA, JOSÉ GASPAR RODRIGUEZ, commonly called Dr. Francia, dictator of Paraguay, one of the most remarkable men connected with the history of South America. The date of his birth is not definitely ascertained, but probably falls about 1757. According to one account, he was of French descent; but the truth seems to be that his father, Garcia Rodriguez França, was a native of S. Paulo in Brazil, and came to Paraguay to take charge of a plantation of black tobacco for the Government. He studied theology at the college of Cordova de Tucuman, and is said to have been for some time a professor in that faculty; but he afterwards turned his attention to the law, and practised in Asuncion. Having attained a high reputation at once for ability and integrity, he was naturally selected for various important offices, and exercised great personal influence. The Robertsons, whose accounts have done so much to blacken his memory, relate how, when he was requested by one of his friends to undertake an unjust cause in his behalf, he not only refused, but went and offered his services to the man who was likely to be wronged, and by his boldness and energy secured his case. On the declaration of Paraguayan independence in 1811, he was appointed secretary to the national junta, and exercised an influence on affairs greatly out of proportion to his nominal position. When the congress or junta of 1813 changed the constitution and established a duumvirate, Dr. Francia and the Gaucho general Fulgencio were elected to the office. A story is told in connection with their installation, which recalls the self-coronation of William I. of England and Napoleon the Great. In theatrical imitation of Roman custom, two curule chairs had been placed in the assembly, one of them bearing the name of Cæsar and the other that of Pompey. Francia seated himself in the Cæsar chair, and left his colleague to play the part of Pompey as best he might. In 1814 he secured his own election as dictator for three years, and at the end of that period he obtained the dictatorship for life. He was no mere nominal sovereign; but for the next twenty-five years he might have boasted, with even more truth than Louis XIV., "L'état c'est moi." In the accounts which have been published of his administration we find a strange mixture of capacity and caprice, of far-sighted wisdom and reckless infatuation, strenuous endeavors after a high ideal and flagrant violations of the simplest principles of justice. He put a stop to the foreign commerce of the country, but carefully fostered its internal industries; was disposed to be hospitable to strangers from other lands, and kept them prisoners for years; lived a life of republican simplicity, and punished with Dionysian severity the slightest want of respect. As time went on he appears to have grown more arbitrary and despotic, more determined to maintain his mastery over the country, and more apprehensive lest he should lose it. And yet at the time of his death it is said that he was generally regretted, and his bitterest opponents cannot deny that if he did much evil he also did much good. Deeply imbued with the principles of the French Revolution, he was a stern antagonist of the church. He abolished the Inquisition, suppressed the college of theology, did away with the tithes, and inflicted endless indignities on the priests. "What are they good for?" was his saying; "they make us believe more in the devil than in God." He discouraged marriage both by precept and example, and left behind him several illegitimate children. For the extravagances of his later years the plea of insanity has been put forward; and it was evident that his worst characteristics were at their worst when the east wind blew. The circumstances of his death were in strange keeping with his life. He was about to sabre his doctor when he was seized with a fit, and he expired the same day, September 20, 1840. He was buried in the cathedral of Asuncion, but the spot is no longer known, and a story is told by Mr. Mansfield and by Lieutenant-Colonel Thomson, to the effect that his body was dug up by some private enemies and flung into the river. On the other hand it is well known that the greatest respect was shown to his memory by those who succeeded him in the government of Paraguay. Unfortunately for the history of his administration, Francia kept no records; and he caused all his orders to be returned to him with the word "executed" on the margin, and then to be destroyed.

The first and fullest account of Dr. Francia was given to the world by two Swiss surgeons, Rengger and Longchamps, whom he had detained from 1819 to 1825—*Essai historique sur la révolution de Paraguay et la gouvernement dictatorial du docteur Francia*, Paris, 1827. Their work was almost immediately translated into English under the title of *The Reign of Dr. Joseph G. R. De Francia in Paraguay*, 1827. About eleven years after there appeared at London *Letters on Paraguay*, by J. P. and W. P. Robertson, two young Scotchmen whose hopes of commercial success had been rudely destroyed by the dictator's interference. The account which they gave of his character and government was naturally of the most unfavorable description, and they rehearsed and emphasized their accusations in *Francia's Reign of Terror*, 1839, and *Letters on South America*, 3 vols., 1843. From the very pages of his detractors Thomas Carlyle succeeded in extracting materials for a brilliant defence of the dictator "as a man or sovereign of iron energy and industry, of great and severe labor." It appeared in the *Foreign Quarterly Review* for 1843, and is reprinted in vol. iv. of the author's *Critical and Miscellaneous Essays*. Comparatively little new light has since been thrown on the subject Captain Richard F. Burton gives a graphic sketch of Francia's life and a favorable notice of his character in his *Letters from the Battle-fields of Paraguay*, 1870, while C. A. Washburn takes up a hostile position in his *History of Paraguay*, 1871.

FRANCIABIGIO (1482–1525), a Florentine painter. The name of this artist is generally given as Marcantonio Franciabigio; it appears, however, that his only real ascertained name was Francesco di Cristofano; and that he was currently termed Francia Bigio, the two appellatives being distinct. He was born in Florence, and studied under Albertinelli for some months. In 1505 he formed the acquaintance of Andrea del Sarto; and after a while the two painters set up a shop in common in the Piazza del Grano. Franciabigio paid much attention to anatomy and perspective, and to the proportions of his figures, though these are often too squat and puffy in form. He had a large stock of artistic knowledge, and was at first noted for diligence. As years went on and he received frequent commissions for all sorts of public painting for festive occasions, his diligence merged in something which may rather be called workmanly offhandedness. He was particularly proficient in fresco, and Vasari even says that he surpassed all his contemporaries in this method—a judgment which modern connoisseurship does not accept. In the court of the Servi (or cloister of the Nunziata) in Florence he painted in 1513 the Marriage of the Virgin, as a portion of a series wherein Andrea del Sarto was chiefly concerned. The friars having uncovered this work before it was quite finished, Franciabigio was so incensed that, seizing a mason's hammer, he struck at the head of the Virgin and some other heads; and the fresco, which would otherwise be his masterpiece in that method, remains thus mutilated to the present day. At Lo Scalso, in another series of frescoes on which Andrea was likewise employed, he executed in 1518–19 the Departure of John the Baptist for the Desert, and the Meeting of the Baptist with Jesus; and, at the Medici Palace at Poggio a Caiano, in 1521, the Triumph of Cicero. Various works which have been ascribed to Raphael are now known or reasonably deemed to be by Franciabigio. Such are the Madonna del Pozzo, in the Uffizi Gallery; the half figure of a Young Man, in the Louvre (a noble work, already mentioned in the article Francia); and the famous picture in the Fuller-Maitland collection, a Young Man with a Letter. These two works show a close analogy in style to another in the Pitti Gallery, avowedly by Franciabigio, a Youth at a Window, and to some others which bear this painter's recognized monogram. The series of portraits, taken collectively, places beyond dispute the eminent and idiosyncratic genius of the master. Two other works of his, of some celebrity, are the Calumny of Apelles, in the Pitti, and the Bath of Bathsheba (painted in 1523), in the Dresden Gallery.

FRANCIS I. (1494–1547), king of France, son of Charles of Orleans, count of Angoulême, and Louisa of Savoy, was born at Cognac 12th September, 1494. As heir-presumptive of the throne of France, he received special favors from Louis XII., who created him duke of Valois and in 1512 gave him the command of the army of Navarre. In this position, though achieving no important results, he conducted himself with such prudence and courage that in 1513 he was appointed to the command of the army in Picardy, where he successfully carried out the plan of defensive operations that was entrusted to him. He married Claude, daughter of Louis XII., in 1514, and succeeded him on the throne 1st January, 1515. After his accession, the first and great object that occupied his ambition was the recovery of Milan, the inheritance of which he claimed through his great-grandmother Valentina Visconti. Accordingly, while, in order to render himself secure against external attacks, he negotiated an alliance with Charles of Austria, afterwards the emperor Charles V., and the renewal of a treaty concluded by Louis XII. with Henry VIII. of England, he also began to collect his forces for an Italian expedition. The politic negotiations which won him Genoa, the acquisition of which was all-important as commanding the connection between Milan and the sea, placed the purpose of his preparations beyond all doubt, and caused Leo X. to unite in an alliance against him with the Spaniards and the Swiss. The Swiss at once occupied all the mountain passes; but Francis, guided by a Piedmontese peasant, succeeded after great labor and difficulty in leading his army over the Alps by a pass deemed impracticable, and, descending into the friendly territories of the marquis of Saluzzo, surprised and routed at Villa Franca Colonna the general of the papal cavalry, and thus outflanking the Swiss caused them to fall back upon Milan. Completely disconcerted by the sudden movement, they at first actually entered into negotiations for a truce; but receiving shortly afterwards a reinforcement of troops and their arrears of pay, they endeavored to surprise the French at Marignano. This battle, begun on the 13th September, 1515, prolonged into the night, and renewed on the following morning, was fought on both sides with furious and stubborn courage; but on the arrival of Alviano the Venetian commander to the succor of Francis, the Swiss retreated unpursued to Milan. Shortly afterwards Milan surrendered, and in November a treaty was concluded between Francis and the Swiss, which subsequently took the form of a perpetual alliance. Such rapid and brilliant success at once gave Francis a position of commanding influence, and enabled him still further to strengthen himself by additional advantageous treaties. In 1516, he compromised the long dispute with the popes by superseding the Pragmatic Sanction of Bourges by a "Concordat," an act which, while it recognized the superiority of the pope over the councils, and gave him the command of the *annates* and other rich sources of revenue, entrusted the French monarch with the power of nominating to vacant benefices. In 1517 he entered into an alliance with the emperor Maximilian and Charles I. of Spain against the Turks; and in 1518 he made an arrangement with Henry VIII. of England, by which France bought back Tournay.

On the death of Maximilian in 1519, Francis became a candidate for the imperial crown; but chiefly through the recommendation of Frederick the Wise of Saxony the choice fell on Charles I. of Spain, from that time known as Charles V. The success of Charles was prophetic of the relative positions which the two rivals were thenceforth to occupy, for the resolute and persevering ambition of the emperor, and his hitherto wholly unsuspected abilities both in war and in diplomacy, were to prove themselves more than a match for the headstrong valor and showy accomplishments of the French monarch. War between them could scarcely have been avoided, even if the materials for kindling it had not been already prepared; but inherited disputes in regard to Navarre, Milan, Burgundy, and Arles would in any case have sooner or later rendered an appeal to the decision of the sword almost inevitable. With a view to such possibilities, the great aim of both was to secure the alliance of Henry of England and the pope, and here fortune again ultimately smiled on Charles. Francis, elated by his previous achievements on the battlefield, and chagrined at the overthrow of his hopes of obtaining the imperial crown, was naturally eager to strike the first blow; and the request of Henry II. of Navarre to aid him in regaining his kingdom came opportunely to second his wishes. Accordingly in April, 1521, he sent an army to the aid of Henry. Charles at once retaliated by an invasion of France, and in May concluded a treaty with Pope Leo X. for the expulsion of the French from Italy. Navarre after being almost won was again lost by Henry; and in Italy the French, chiefly through the blunders of Lautrec, the brother of the king's mistress, lost Milan, Genoa, and all their conquests with the exception of the stronghold of Cremona; but the attempt of the imperialists to enter France was pushed back, and Francis, following in pursuit, only by unaccountable negligence missed the opportunity of inflicting a crushing defeat on Charles between Cambray and Valenciennes. After this, difficulties continued to thicken round the French king; on the 9th January, 1522, the papal throne was mounted by Adrian VI., who had formally been tutor to Charles V., and in May Henry VIII. declared war against France; in August, 1523, a coalition was formed against her which included the pope, the emperor, the king of England, the archduke of Austria, the duke of Milan, and the principal Italian republics; and about the same time Charles Constable Bourbon, having been unjustly used by Louise of Savoy, withdrew from France, and offered his sword to Charles V. The Spanish troops crossed the French frontiers at Bayonne; the English entered Picardy, and advanced to within 11 leagues of Paris; and after the repulse of the French army despatched against Milan, the imperialists passed over into Provence and laid siege to Marseilles. Through cautious but stubbornly defensive tactics, however, both the Spanish and English incursions were foiled, and Francis was thus able to advance to the relief of Marseilles with a large army. The imperialists did not wait his approach; but, determined on retaliation, he crossed the Alps and laid siege to Pavia, where a strong Italian force had taken refuge. Here he was attacked, 24th February, 1525, by a relieving army under Bourbon and Pescara. The attack was unsuccessful; but, flushed with the victory which he believed already in his grasp, he rashly left his impregnable position, and so blundered in his manœuvres as to render his overwhelming defeat inevitable. His army was speedily either cut down or dispersed in flight, and he himself, after a desperate attempt to rally, was made prisoner and conveyed by Charles to Madrid. He only regained his liberty, 21st February, 1526, by signing a treaty whereby he ceded to Charles both Burgundy and Milan. Its stipulations were guaranteed by the retention of his two sons in the emperor's hands; but he nevertheless resolved to disregard it, and in this he was supported by Pope Clement VII. and also by Henry of England, whom jealousy and alarm at the emperor's success had induced to change sides. Though formal war was not declared, a French army was despatched to Italy, but the supineness with which the campaign was prosecuted enabled the imperialists to have it all their own way; and an army of mercenaries under Bourbon, who perished in the assault, marching unopposed to Rome, captured and sacked the city, and took the pope prisoner. On this Francis and Henry at once declared war against the emperor; but the army sent into Italy under Lautrec almost melted away before the walls of Naples: and Genoa, by suddenly declaring for the emperor, completed the ruin of the French cause in Italy. The pope soon thereafter saw it to be his interest to be reconciled with Charles; and in August, 1529, Charles and Francis agreed to the treaty of Cambray, by which Francis retained Burgundy and obtained by a ransom the release of the French princes, but renounced his claims in Italy and ceded Artois and Flanders to his rival. He also agreed to fulfil the promise entered into at Madrid to marry Eleanor of Portugal, sister of Charles, his first wife having died in 1524. During the years of peace that followed this treaty, Francis, though he had encouraged the Smalkald League in Germany, persecuted with great vigor the adherents of Protestantism in his own kingdom; but when war was again declared, he issued an edict of toleration. The pretext for the renewal of the war was the murder of the French ambassador by Duke Sforza of Milan in 1533, but hostilities were delayed till 1535, when, emboldened by the weakened condition of the emperor after his war against the Turks, Francis overran Savoy and took possession of Turin. His advantages were, however, followed up with so little energy that Charles, after driving the French out of Italy, began an invasion of Provence; and his progress was only checked by the barbarous destruction of the country before him by Anne of Montmorency. Meantime Francis attacked Flanders, and entered into an alliance with Sultan Soliman II., whose invasion of Hungary induced Charles in 1538 to consent to the ten years' truce of Nice. In 1540 Charles, while the guest of the French monarch, held out to him the hope of a complete satisfaction of his wishes through the investiture of the duke of Orleans with the duchy of Milan; but the promise, if definitely made, was never fulfilled, and Francis, finding a favorable opportunity after the disastrous issue of the emperor's expedition against Algiers, renewed on a flimsy pretext the war in 1542. An offensive alliance was formed with the Turks, the duke of Cleves, and Denmark and Sweden; separate armies attacked at various points the Spanish, Flemish, and Italian frontiers; and the united French and Turkish forces captured and burned Nice. The monotony of the indecisive conflict was relieved in April, 1544, by a brilliant French victory at Ceresole, but the success came too late to permit of its being followed up by an advance into Italy; for in the July following, the emperor from Champagne and the king of England from Picardy were marching to join their forces before the walls of Paris. The siege of Boulogne by the English gave Francis, however, sufficient time to make a show of defence such as convinced Charles of the doubtful nature of the enterprise; and without consulting the king of England he sent to Francis from Crespy terms of peace, which were signed 17th September. By this treaty France retained Burgundy and resigned its claims on Flanders, Artois, and Naples, while the duchy of Milan was promised to the duke of Orleans on his marrying one of the imperial princesses—an arrangement, however, which his death in 1545 rendered nugatory. For some time afterwards the English king continued the war in Picardy, but a treaty of peace was signed in June, 1546. As soon as peace was concluded with the emperor, the prosecution of the Protestants in France was renewed, and in 1545 an edict was passed for the expulsion of the Waldenses from Provence. The health of Francis had for several years been completely undermined, and he succumbed to an acute attack of disease, 31st May, 1547.

In the reign of Francis were combined most of the faults and excellences which have been specially prominent in the subsequent history of his country. He was in a sense the creator of a new political and intellectual era. As regards government, he was virtually the founder of the "ancient régime," whose final result and overthrow was the great Revolution; he gave its death blow to feudalism; he deprived the *parlements* of all independent power; under the auspices of the minister Du Prat he confirmed and extended the system of corruption in civil and ecclesiastical appointments; and he turned the efforts of statesmanship away from the paths of constitutional progress, and into those of military renown. His reign in its social and intellectual results was more beneficial, for if he sanctioned by his example licentiousness of manners, he at the same time gave a great impulse to refinement in taste and to intellectual progress by fostering in his country the offshoots of the Italian Renaissance. He founded in 1530 the college of France for the study of the three languages; he was himself a writer of verses, and a special friend and benefactor of artists and men of letters; and by the purchase of the great masterpieces of Italian painting and sculpture, and in the magnificent structures of Chamford, Azai-le-Redeau, Amboise, and Fontainebleau he left behind him a permanent influence on French art. Compared with his great rival Charles V., he was open, impulsive, and generous, but he was less actuated by consistent principles; he was hopelessly inferior in diplomacy, and in sagacity and comprehensiveness of purpose; he had perhaps equal abilities as a general, but his occasional victories were more than counterbalanced by the results of his own indolence and by the blunders of his subordinates; and while able to defend France against all external attacks, he was compelled to content himself with a place second to that of the emperor in the sphere of European politics.

See, besides the usual French histories. *La Vie de Chevalier Bayard*, Bouchet's *La Vie et les Gestes de Louis de la Tremoille* and *Les Triomphes du roi très chrétien François I.*, Vielleville's *Mémoires*, Fleurange's *L'Histoire des choses mémorables advenues de 1499 à 1531*, and Du Bellay's *Mémoires historiques de 1513 à 1547*,—all contained in the *Collection universelle ;* Montluc, *Commentaires* (1st ed. 1592, afterwards printed both in Italian and English); Varillas, *Histoire de François I.*, 1685; Gaillard, *Histoire de François I.*, 1766–1769, 7 vols.; Röderer, *Louis XII. et François I.*, 1825; Capefigue, *François I. et la Renaissance*, 1844; De La Barre-Duparcq, *François I. et ses actions de guerre*, 1872; Mignet, *Rivalité de François I. et de Charles-Quint*, 2 vols., Paris, 1875; Herman, *Franz I.*, Leipsic, 1825; *Life and Times of Francis the First*, London, 1829.

FRANCIS II. (1543–1560), king of France, eldest son of Henry II. and of Catherine de' Medici, was born at Fontainebleau, 19th January, 1543. He married the famous Mary Stuart, daughter of James V. of Scotland, 25th April, 1558, and ascended the French throne 10th July, 1559. During his short reign he was the mere tool of his uncles, the duke of Guise and the cardinal of Lorraine, into whose hands he virtually delivered the reins of government. The exclusiveness with which they were favored, and their high-handed proceedings, awakened the resentment of the princes of the blood, Anthony king of Navarre and Louis prince of Condé, who gave their countenance to a conspiracy with the Protestants against the house of Guise. It was, however, discovered shortly before the time fixed for its execution in March, 1560, and an ambush having been prepared, most of the conspirators were either killed or taken prisoners. It leadership and organization had been entrusted to Godfrey du Barry, lord of La Renaudie; and the prince of Condé, who was not present, disavowed all connection with the plot. The duke of Guise was now named lieutenant-general of the kingdom, but his Catholic leanings were somewhat held in check by the chancellor Michel de l'Hôpital, through whose mediation the edict of Romorantin, providing that all cases of heresy should be decided by the bishops, was passed in May, 1560, in opposition to a proposal to introduce the Inquisition. At a meeting of the states-general held at Orleans in the December following, the prince of Condé, after being arrested, was condemned to death, and extreme measures were being enacted against the Huguenots; but the deliberations of the Assembly were broken off, and the prince saved from execution, by the king's somewhat sudden death, on the 5th of the month, from an abscess in the ear.

Varillas, *Histoire de François II.; Mémoire de Condé;* Hénault, *François II. roi de France*, 1748; De La Barre-Duparcq, *Histoire de François II.*, 1867.

FRANCIS I. (1708–1765), head of the Holy Roman Empire, the eldest son of Leopold, duke of Lorraine, was born on the 8th of December, 1708. His full name was Francis Stephen. At the age of fifteen he was sent to Vienna, where he received the Silesian duchy of Teschen. In 1735, in return for Lorraine, which Charles VI., at the end of the war of the Polish succession, gave to Stanislaus Leszczynski, Francis Stephen obtained the reversion to the duchy of Tuscany, to which he succeeded in 1737. The year before the latter date he married Maria Theresa, the daughter of the emperor Charles VI., and after the emperor's death in 1740 he was declared by his wife joint regent of her dominions. He was elected emperor after the death of Charles VII., and crowned at Frankfort on the 4th of October, 1745. He carried on extensive trading operations, and was an enthusiastic collector of works of art; but he had no energy of character, and was quite willing that the empress-queen, Maria Theresa, should do all the real work of government. When Austria and France, laying aside the animosities of two centuries, were coming to an understanding before the Seven Years' War, he was shrewd enough to see the difficulties which would inevitably arise from such an alliance. Maria Theresa, however, although she sincerely loved him, had no respect for the political judgment of her good-natured husband, and he quietly acquiesced in her will. He suddenly died at Innsbruck on the 18th of August, 1765, falling into the arms of his second son Leopold, who succeeded him as duke of Tuscany, and ultimately (after the death of Joseph II.) became emperor.

FRANCIS II. (1768–1835), the last Holy Roman Emperor, and, as Francis I., first emperor of Austria, was born in Florence on the 12th February, 1768. He was the son of the emperor Leopold II., after whose death, in 1792, he succeeded to the hereditary dominions of the house of Austria, being crowned emperor in the same year. Before this time he had gained some experience of war during the conflict of the emperor Joseph II. with the Turks. He was immediately involved in the first of his famous wars with France, in which, till 1795, he had the support of the king of Prussia. In 1794 he himself was with the Austrian army which defeated the French at Tournay; but when fortune turned on the side of France he went back to Vienna. He was compelled, mainly in consequence of the victories of Napoleon, who pressed northward from Italy into Carinthia, to conclude, on the 17th October, 1797, the treaty of Campo Formio, whereby the empire lost the greater part of the left bank of the Rhine, and Austria had to give up the Netherlands and Lombardy. Austria received in return Venetia, Friuli, Istria, and Dalmatia. In 1799 war broke out afresh, the emperor having on this occasion England and Russia as allies. During the first campaign the French were everywhere defeated; but in the following year Napoleon gained the brilliant victory of Marengo, while Moreau was equally successful at Hohenlinden. The shock of these two battles made it impossible for Austria to continue the war, and on the 9th February, 1801, she concluded the treaty of Lunéville, which confirmed that of Campo Formio, besides exacting fresh sacrifices. France now obtained the whole of the left bank of the Rhine. Once more in association with Russia and England, the emperor began another war with France in 1805. The capitulation of Ulm and the battle of Austerlitz, great as were these disasters, did not make the case of Austria hopeless, for she still had large forces, Russia was willing to continue the war, and the power of France had been seriously crippled at Trafalgar. But Francis was dispirited, and craved peace. On December 25, 1805, was concluded the treaty of Presburg, which deprived Austria of Venetia and Tyrol. In 1806, after the formation of the Confederation of the Rhine, he formally resigned the imperial crown, thus bringing to an end the Holy Roman Empire and the kingdom of Germany. Forgetting the true meaning of the word emperor, he had in 1804 proclaimed himself, as Francis I., hereditary emperor of Austria; and this title has been retained by his successors. He took no part in the war of Prussia with France in 1806, but after some time began to make preparations for a determined struggle, by which he should regain all the advantages lost in previous wars. The new conflict broke out in 1809, and the whole of Germany awaited the result with intense anxiety. Austria was unfortunate at first: but the highest hopes were excited by her thorough victory of Aspern. It was followed by the battle of Wagram, which enabled Napoleon to dictate peace from the palace of Schönbrunn, where he had once before taken up his quarters. By the treaty of Schönbrunn (October 14, 1809) he transferred the allegiance of about four millions of Austrian subjects to other rulers; but as in the following year he married Maria Louisa, the eldest daughter of Francis, it seemed probable that the two sovereigns would in future be on friendly terms. Francis was the ally of Napoleon in his war with Russia in 1812; and when, after the retreat from Moscow, France found herself confronted by Russia and Prussia, Austria at first remained neutral, and in the summer of 1813 acted as mediator. In August of the same year she joined the allies; and, like the sovereigns of Prussia and Russia, Francis accompanied his troops in the war which followed. The settlement of Europe which resulted from the final defeat of Napoleon made Francis a more powerful sovereign than he had been at the beginning of his reign; and from this time forward he lived at peace, except that he had to put down a rising in Lombardy in 1821. He was a well-meaning ruler, but had been so alarmed by the successes of the French Revolution that he detested modern ideas of government. The aspirations of his various states for some measure of independence he regarded as criminal, and in Prince Metternich he found a willing agent for his policy of stern repression. Thus a large amount of discontent was excited, which prepared serious troubles for the emperors who came after him. Francis was married four times, having by his second wife, Maria Theresa, princess of Sicily, thirteen children. He died on the 2d March, 1835, and was succeeded by his son Ferdinand.

FRANCIS, St. (1182–1226), a well-known saint of the

Roman Catholic Church, the founder of the great order of Franciscans, was born at Assisi in the year 1182. His father was a trader in goods which he appears chiefly to have purchased in the south of France, to which he made frequent journeys; and his son was born during one of these journeys, and in consequence received from the grateful father on his return the name of Francesco. His mother had wished to call him, it is said, Giovanni or John, The youth grew up very much like any other boy of his class. He received but little learning from the priest of the parish, and does not seem to have manifested any special love for school instruction. He was by nature a merry-hearted and careless fellow, and developed early an inclination for fine clothes and street amusements with other boys of his class. His parents, indulgent to his gayeties, saw with pride the higher tastes and bright intelligence of their son, and would sometimes say to one another, "He is like the son of a prince." The father formed expectations of a successful courtly career; but the mother, seeing more into the boy's heart, would say to her neighbors, "If he lives like the son of a prince now, he shall hereafter be a child of God."

Soon a great change came to him. At the age of twenty-five Francis was seized with a severe illness. Reflections came to him on his sick-bed, and he rose from it an altered man. Henceforward, says one of his biographers, "he held that in contempt which he had hitherto held in admiration and love." The ardor of his natural character flamed forth first in the idea of military devotion, and then in a consuming spirit of self-sacrifice for the good of others. All his love of amusement and worldly display disappeared. He began to speak of poverty as his bride; and the poor and the sick and the leper became the objects of his peculiar care. He would seek out the lepers, hitherto abhorred by him as by the popular feeling, and kiss them and minister to their wants. He made a pilgrimage to Rome, and in his enthusiasm for poverty flung all he had on the altar of St. Peter's, joined himself to a troop of beggars, and gave himself up to a wandering life of almsgiving and charity. His mother guessed something of the feelings that were struggling in her son's heart; but his father, not unnaturally, was greatly concerned at his conduct. At last matters came to an open rupture between them; and the saint's severance of the parental tie for the sake of his divine mission is a significant incident in his career with all his biographers. It happened in this wise. There was an old church or small chapel of the name of St. Damian in the neighborhood of Assisi which had fallen into ruins. The spot was a favorite one with the youthful enthusiast for meditation and prayer; and one day as he sat in meditation among the ruins he seemed to hear a voice saying to him clearly, "Francis, seest thou not that my house is in ruins? go and restore it for me." To hear was to obey. The divine voice, as with some other enthusiasts, seemed to silence every other voice in his heart, even the voice of conscience. He returned home, saddled his horse, took a bale of his father's goods, and repairing to Foligno he sold both horse and goods, and rushed to the priest of St. Damian with the money to pay for the restoration of the church. The good priest was startled; his father heard with indignation of his son's conduct, and at length with blows and curses securely imprisoned him from any further freaks. But his father's harshness overshot the mark. Released by the tenderness of his mother, and summoned to restore the goods he had taken away and renounce all his patrimonial rights, the popular feeling, which had previously sided with his father against him, now turned in the youth's favor. The bishop, before whom the case finally came, discovered the youth's vocation to a religious life, and induced him to restore the value of the goods to his father. The money had been all the while lying neglected amidst the ruins of the church. This accomplished, Francis renounced all dependence upon his father, and gave himself up to the profession of a religious mendicant. "I have but one, a Father in heaven, now," he said. The people were melted to tears by his devotion, and the good bishop took him for a time under his own charge.

Gradually Francis found his full vocation, not only in a life of entire devotion and poverty for himself, but in founding an order of mendicants devoted to the service of the church. It was in the old scene of his earlier inspiration that the new idea came to him. Once more the divine voice was heard sounding in his ears: "Provide neither gold nor silver nor brass in your purses, nor scrip for your journey, neither two coats, nor yet staves." This was about the year 1208 or 1209, when, therefore, the saint was about twenty-six years of age. He was henceforth a preacher as well as an exemplar of poverty. He essayed to reproduce the picture of the divine life on earth, having not where to lay his head, going about doing good, and preaching the gospel of the kingdom. "Sell all that thou hast, and give to the poor; then thou shalt have treasure in heaven." Gradually there gathered round his cell, which he had fixed outside the town near a little church, the St. Maria degli Angeli, better known as the Portiuncula, a band of disciples as enthusiastic as himself. "Fear not," he said to them, "because you are small and seem foolish. Have confidence in the Lord who has vanquished the world. Some will receive you. Many proud will resist you. Bear all with sweetness and patience. Soon the wise and the noble will be with us. The Lord hath given me to see this. I have in my ears the sounds of the languages of all the people who will come to us,—French, Spaniards, Germans, English. The Lord will make us a great people, even to the end of the earth."

In this insignificant manner was laid the foundation of the great Franciscan order. At first there were only seven, himself the eighth, but all were animated by the same spirit, and all followed the same rule of life. As he sent them forth he said, "Go and preach two and two. Preach peace and patience; tend the wounded; relieve the distressed; reclaim the erring; bless them which persecute you, and pray for them that despitefully use you." The gospel of divine poverty was proclaimed everywhere. The spirit of self-renunciation spread by and by like wildfire, and multitudes were added to the order day by day. It may seem to our modern imagination a fantastic dream, but the gospel of St. Francis met a congenial root in the social and spiritual life of the 13th century, and rapidly grew into great results. The sanction and blessing of the papacy, however, were necessary to give the order ecclesiastical position and influence. Francis himself undertook a new journey to Rome, and suddenly appeared before the great Innocent III. as he was walking one day on the terrace of the Lateran. The startled pope dismissed the mean stranger with mingled pity and contempt; but the same night a vision came to him of the marvellous growth of a palm tree from meanness to magnificence; and, as he pondered the meaning of the vision, a divine whisper reached him that thus powerful on behalf of the church was to prove the poor man whose appearance had startled him. The natural conclusion followed. The poor man was recalled, his projects were submitted to the judgment of the Vatican, and the result was that the papal saction was formally extended to the order,—a few years before the same sanction was given to the great rival order headed by the learned and noble Dominic. The founders of the two great mendicant orders are said to have met afterwards at Rome, and again at a great meeting of the Franciscans in 1219. St. Dominic is credited with the most friendly greetings offered to his brother saint. "Thou art my companion; thy work and mine is the same." It is said also that he looked with amazement at the second meeting on the remarkable fascination which the simple-minded Francis exerted over his followers. But it is difficult to know whether these reputed *rapprochements* of the great leaders were not an afterthought of their biographers, interested in promoting the idea of the friendliness of the two powers which were destined for a time to divide the influence of the church between them.

Francis founded an order of poor sisters as well as poor brothers, known by the name of Poor Claras or Clarisses. The origin of the sisterhood is encircled in a halo of romance, such as everywhere surrounds the footsteps of St. Francis. Clara was a young lady of the neighborhood, who, either attracted by the saint's preaching, or enamored of his life of poverty, or both, resolved to devote herself to self-sacrifice as he and his companions had done. He is said to have "poured into her ears the sweetness of Christ." The result was that she forsook her home, fled to the Portiuncula, and, being first a member of the order, was then placed in a female convent. From this questionable beginning sprang the sisterhood nearly as famous in its history as the great brotherhood, and which survives till this day. There was a third order also sprung up in the course of the saint's lifetime. So marvellous were the consequencess of his preaching that whole populations, it is said, wished to devote themselves to consecrated poverty. But many, of course, had no real vocation to such a service, and Francis, visionary as he was, saw that the excesses of his system might prove its ruin. So he arranged to receive persons of this class into an order of what was called Tertiaries or Brethren of Penitence, who retained their social position and their customary employments in the world, while coming under general vows to abstain from worldly dissipations, such as the theatre, and otherwise to be scrupulous in all their conduct. Women were not admitted to this order without the consent of their husbands. Its members did not wear silk or other costly materials, but they had no special costume, and otherwise were at liberty. His conduct in this matter is sufficient to prove that, amidst all the apparently childlike enthusiasm of the saint, he possessed, as indeed cannot be doubted, no inconsiderable vein of shrewd discernment and of practical ability. This order was established in 1221.

Meanwhile Francis was unceasing in his personal labors. It is not easy to trace the chronology of his age or his adventures; but the same spirit of self-sacrifice, of burning ardor and spiritual industry, is everywhere conspicuous. He made long missionary journeys to Illyrica, to Spain, and even to the East, to preach to the Mahometans. He gained access to the sultan, it is said, and proclaimed to him the gospel of poverty. He was for some time in the Holy Land, and everywhere he gained multitudes of disciples. The atmosphere of miracle everywhere accompanied him, and his fame was spread throughout Christendom. Whatever we may think of many events of his life, and impossible as it is now to disentangle the legendary thread of the supernatural from its more credible texture, there are many traits of the saint's character which are in no sense doubtful, but show with a clear and life-like impress what sort of a man he was. He was passionately fond of all living things, and found his chief happiness in ministering to the needs of his fellow-creatures or the enjoyment of the lower creatures around him. His love for animals of all kinds was one of his most remarkable and winning features. Of the birds in the woods, the sheep in the fields, the ass on which he rode, the bees, the hares, the rabbits, he always spoke as his brothers and sisters. When the birds sang he said, "Our sisters, the birds, are pleasing God." A little rabbit ran to him for protection; it was received into his bosom, as one of his biographers, the famous general of the order Bonaventura, says, "as if it had some hidden sense of the perfection of the father's heart." The very wolves, which all men were afraid to encounter, were tamed by him, and came like lambs and crouched at his feet. So at least it is related in one memorable case in the legends of the "Fioretti di San Francesco" (the "Little Flowers of St. Francis,"—a collection of marvellous stories about the saint very popular in Italy to this day). There may be much in these stories that exceeds the limits of credibility; the amount of accurate fact lying beneath them can no longer be traced; but none can hesitate to believe the beautiful depth of love which they reveal in the character of St. Francis, and the fascination of personal influence which they show to have been possessed by him.

Connected with his love of nature and all living things was his poetry—for St. Francis was not only saint but poet. The stream of Italian song, so soon to swell into the full volume of Dante (1265–1321), began to flow in the rugged but touching verse of the great preacher of Assisi. In him the troubadour inspiration, dying out in its original seat, was transmuted into a spiritual minstrelsy—hardly poetry, so imperfect is its form, but a lyrical cry, as Ozanam says (in his volume *Les poëtes franciscains*, 1852), the first broken utterance of a new voice which was soon to fill the world. The most characteristic of his songs is a *Cantico delle Creature* (Song of the Creation), which has been translated in Mrs. Oliphant's interesting life of the saint.

Marvellous as is the life of St. Francis, the marvel that followed his death is more astonishing than any that marked his earthly career. It is said that when his naked body was visible after death, there were found upon it legibly impressed the marks of our Lord's passion; and the sacred story is that one day as he prayed in the solitude of Mount Averno, near the sources of the Tiber and the Arno, there appeared to him the vision as of a seraph with the arms extended and the feet as if fixed to a cross; and as he thought in his heart what the vision might mean, there were revealed on his hands and feet the signs of nails as in the Crucified One. This is well known as the famous miracle of the *Stigmata* or wounds of our Lord. There seems to be no doubt that some such marks were found on the dead body of the saint, whatever explanation the phenomena may admit of. That there was anything really supernatural in the phenomena will be so readily discredited by the modern reader that it is unnecessary we should attempt any elaborate solution of the marvel. An interesting analysis of all the facts, and such historical explanation as they seem to admit of, will be found in Hase's life of the saint, and an article, founded upon the analysis there given, in *Good Words* for 1867, p. 38 ("History of a Miracle"). St. Francis, worn out by his many labors and consuming zeal, died on 4th October, 1226.

"Of all saints," says Milman (*Hist. of Latin Christ.*, vol. iv. 268), "St. Francis was the most blameless and gentle. He was emphatically the saint of the people,—of a poetic people like the Italians." And to this day the name, the life, and the long-suffering of the popular saint live in the hearts of the poorer and devout Italians.

Of what may be called more or less original biographies of the saint there are in the well known *Acta Sanctorum* no fewer than three:—(1) The *Life* by Thomas of Celano (whose name is also associated with the composition of the famous *Dies Iræ*), written only three years after the saint's death; (2) the *Life of the Tres Socii*, three companions of the saint, written in 1247; and, lastly, (3) the *Life* by Bonaventura, Platonic schoolman and general of the order in 1263. The works of the saint have been collected and edited by Joh. de la Haye, *S. Francisci Opera*, 1739 *sq*. There is an elaborate biography by Malan, *Hist. de S. François d'Assisi*, 1841; and notices are also to be found in Helyot's *Hist. des Ordres Religieux*, t. vii., and Butler's *Lives of the Saints*. There are two recent lives, both of special interest, by the German divine, Hase, and by Mrs. Oliphant in Macmillan's Sunday Library series. See FRANCISCANS. (J. T.)

FRANCIS BORGIA, St. (1510–1572), duke of Gandia, and afterwards general of the Jesuit order, was the son of John, duke of Gandia, a scion of the well-known family of Borgia or Borja, to which Popes Calixtus III. and Alexander VI. had belonged, and of Joanna of Aragon, daughter of Alphonso, a natural son of Ferdinand the Catholic. He was born at Gandia (Valencia), on the 10th of October, 1510, and from his infancy was remarkable for his piety. Educated from his twelfth year at Saragossa under the charge of his uncle the archbishop, he had begun to show a strong inclination towards the monastic life, when his father, wishing to divert his thoughts elsewhere, sent him in 1528 to the court of Charles V. Here he soon distinguished himself greatly by his diligence and fidelity; and on his marriage with Eleanor de Castro, a Portuguese lady of high rank, he was created by the emperor Marquis of Lombay, and at the same time received the appointment of master of the horse to the empress. He accompanied Charles on his African expedition in 1535, and also into Provence in 1536; and on the death of the empress in 1539 he was deputed to convoy the body to the burial place in Granada. Circumstances connected with the funeral obsequies there deepened in his mind long-cherished impressions as to the vanity of all worldly things, and fixed his determination to leave the court betimes, and also, should he survive his consort, to embrace the monastic life. On his return to Toledo, however, new honors were thrust upon him, much against his will; he was made viceroy of Catalonia and commander of the order of St. James. At Barcelona, the seat of his government, he lived a life of great austerity, but discharged his official duties with energy and efficiency until 1543, when, having succeeded his father in the dukedom, he at length obtained permission to resign his viceroyalty, and to retire to a more congenial mode of life at Gandia. Having already held some correspondence with Loyola, he now encouraged the recently founded order of Jesuits to the utmost of his power. One of his first cares at Gandia was to build a college for them; and on the death of Eleanor in 1546, he resolved to become himself a member of their society. The difficulties arising from political and family circumstances were removed by a papal dispensation, which allowed him, in the interests of his young children, to retain his dignities and worldly possessions for four years after he should have taken the vows. In 1550 he visited Rome, where he was received with every mark of distinction, and where he furnished the means for building the Collegium Romanum. Returning to Spain in the following year, he, with the emperor's consent, formally resigned his rank and estate in favor of his eldest son, laid aside his ducal robes, assumed the Jesuit habit, was ordained as a priest, and entered upon a life of penance and prayer. At his own earnest request, in which he was seconded by Loyola, a proposal that he should be created a cardinal by Julius III. was departed from; and at the command of his superior he employed himself in the work of itinerant preaching. In 1554 he was appointed commissary-general of the order in Spain, Portugal, and the Indies, in which capacity he showed great activity, and was successful in founding many new and thriving colleges. In 1556, shortly after the retirement from public life of his old master Charles, Borgia had an interview with him. Charles, unfavorable to all innovation, and looking with distrust upon Jesuit pretensions, endeavored, it is said, to induce the commissary to transfer his allegiance to the older order of Jeronymites. This attempt, though unsuccessful, did not disturb the old relations of confidence and friendship between the two men, as was shown some time afterwards when Borgia was employed by Charles to conduct some delicate negotiations with reference to a project which was to secure for Don Carlos of Spain the succession to the Portuguese crown in the event of the death of his cousin Don Sebastian. On the death of Lainez in 1565, Francis Borgia was chosen to succeed him as third general of the Jesuits. In this capacity he showed great zeal and administrative skill; and so great was the progress of the society under his government that he has sometimes been called "its second founder." It is to be noticed, however, that the peculiarities which are understood to be most characteristic of the order have been derived from Loyola and Lainez rather than from Borgia, whose ideal was a pure and simple monasticism rather than a life of manifold and influential contact with the world. His death took place at Rome towards midnight on the 30th of September, 1572. He was beatified by Urban VIII. in 1624, and canonized by Clement X. in 1671, his festival being afterwards (1683) fixed by Innocent XI. for the 10th of October.

Several works by St. Francis Borgia have been published, the principal of these being a series of *Exercises* similar to the *Exercitia Spiritualia* of Loyola, and a treatise *Rhetorica Concionandi*. The *Opera Omnia* were published at Brussels in 1675. His life was written by his confessor Ribadeneira. See also Butler's *Lives of the Saints*, and the *Breviarium Romanum* (second nocturn for 10th October).

FRANCIS, St., of Paola (1416–1507), founder of the order of Minims (Ordo Minimorum Fratrum Eremitarum Fratris Francisci de Paula), was born of humble parentage at Paola in Calabria in the year 1416. His education appears to have made very little progress until he reached his thirteenth year, when, in accordance with a vow, he was taken by his father to the Franciscan convent of San Marco in Calabria. Here he learned to read, and distinguished himself by his austerities; but at the close of a probationary year he, for some reason that is not mentioned, left San Marco, and, after a pilgrimage to Assisi and Rome, retired to the neighborhood of his native town, where in a cave by the sea-shore he gave himself wholly to a hermit life, after the example of the great St. Francis, having no bed but the bare rock, and no other food than the herbs which he gathered in the neighboring wood, or which were sometimes brought to him by his friends. In the course of time he was joined by some others like-minded with himself, and the building of a chapel in 1436 is generally considered as marking the first beginning of the Minimite order. At that time, however, and for many years afterwards, they were mere "Eremites of St. Francis," and did not claim to be distinguished from other Franciscans unless by a stricter fidelity to the common principles of the order. In eighteen years the little community had increased so much in numbers and in popularity that, with the help of a friendly neighborhood, it was able to build a large church and monastery in 1454. In 1469, owing to reports which he had received, Pope Paul II. sent one of his chamberlains into Calabria to ascertain the actual condition of matters at Paola; the account brought back by him was highly favorable, and the result was that in 1474 the order of the Eremites was incorporated by a bull of Sixtus IV., and Francis appointed its first "corrector" or superior-general. In addition to the usual vows, there was a special rule, which pledged the members to the observance of a perpetual Lent. Several new convents were founded in Calabria and Sicily during the following years; and the fame of Francis for sanctity and miraculous powers increased daily. When Louis XI. of France was seized with his last illness, he despatched a special message to beg of the holy man that he would come and restore him to health. Not until he had been commanded by Pope Sixtus IV. could Francis overcome his reluctance to undertake so long a journey on so doubtful an errand; and on his arrival at Plessis-lès-Tours, in April, 1482, to the king's entreaties for his intervention to prolong his life he simply replied that the lives of kings had their appointed limits, that God's decree was unchangeable, and that for his Majesty nothing remained to be done but to resign himself to the divine will and prepare for death. At the request of Louis, Francis remained at Plessis; where he was treated with great respect by that sovereign, and also by his successor Charles VIII. In particular, the latter built two convents for the order, one near Plessis and another at Amboise; and on his triumphant arrival in Rome in 1495, he caused a third to be erected there. In 1501–2 a new and stricter constitution was granted to the order by Alexander VI., who at the same time conceded all the privileges and immunities enjoyed by the other mendicant orders, and bestowed, at the urgent request of Francis, the distinctive name of Minimi, which has ever since been retained. At the same time a lay order of Tertiaries was sanctioned, under a special rule. In 1506 the fourth vow (to observe a perpetual Lent) was made more definite and stringent in its character by Julius II. The death of Francis took place in his ninety-first year, at Plessis, on the 2d of April, 1507. He was canonized by Leo X. in 1519,—his day in the calendar being April 2 (Duplex).

A graphic incidental notice of Francis occurs in the *Memoirs* of Philip de Comines (b. vi. c. 7), who says, "I never saw any man living so holy, nor out of whose mouth the Holy Ghost did more manifestly speak." A brief sketch of his life occurs in the *Breviarium Romanum;* and his miracles and prophecies are related at considerable length by the Bollandists. Reference may also be made to Butler's *Lives of the Saints*. The order of Minims, called also Les Bons Hommes in France, Los Padres de la Vitoria in Spain, and Paulaner or Pauliner in Germany, never attained to any great prominence by the side of the great societies of Dominic and Francis of Assisi. Their cloisters never exceeded 450, and at present are very much fewer. The principal establishment is in Rome.

FRANCIS, St., of Sales (1567–1622), bishop of Geneva, and a well-known devotional writer of the Roman Catholic Church, was born at the Château de Sales, near Annecy in Savoy, in 1567. His father, known as M. de Boisy, was a Savoyard, seigneur, soldier, and diplomatist; his mother was also of a noble family and an heiress, the title De Boisy being derived from one of her hereditary possessions. Francis was their eldest son, born six years after marriage, and the child of many prayers. He received his education first at Annecy, then at the Jesuit College de Clermont in Paris, and for some time it seemed uncertain whether he should devote himself to law or the church. He studied jurisprudence, after leaving Paris, at Padua, became an advocate of the senate of Savoy, and seemed likely to gratify his father's cherished ambition for his future career. But all the while Francis's own inclinations were strongly towards the church. He had received the tonsure as early as 1578, while still a boy at Annecy, very much against his father's wishes, and the spirit shown in this early manifestation of pious self-devotion never forsook him. Notwithstanding all his father's remonstrances, he resolved to enter an ecclesiastical life; and, the office of provost or dean of Geneva becoming vacant, the dignity of this office, which was offered to him, was used as a temptation to secure the father's consent. At length M. de Boisy gave way. Francis received holy orders (1593), and entered upon his duties as dean and preacher. He possessed great gifts as a preacher, and his fame soon spread through Savoy. His sermons were marked by great simplicity and persuasiveness. "The only real point of preaching," he said, "is the overthrow of sin and the increase of righteousness;" and the principle of this saying guided him in all his sermons. He preached constantly, and in the simplest and most touching and popular words he could find. His father failed to appreciate his style of preaching, as he had failed to understand his self-denial. "I never refused to preach," Francis tells us, "on the principle of 'give to them that ask you.' My dear father used to hear the bells ringing, and asked who preached. 'Who but your son,' was often the answer. One day he took me aside and said, 'Provost, you preach too often; even on week days the bells go, and it is always the same story, the provost, the provost! It used not to be so in my day. Sermons were much rarer. But then, to be sure, God knows those were something like sermons—full of learning, well got up, more Latin and Greek in one than you stick into a dozen.'" Francis, however, knew his own mind, and was not moved. "My test of the worth of a preacher," he said, "is when his congregation go away saying not 'what a beautiful sermon,' but 'I will do something.'" A man may set forth his own learning and eloquence in a fine sermon, but the true sign of success is when his words induce people to leave off bad habits. And as he preached often, he preached briefly. "The more you say, the less people remember; the fewer your words, the greater their profit," was his motto. "When a sermon is too long, the end makes one forget the middle and the middle the beginning."

Francis was plainly a man of some originality both of mind and character, and destined to become a power in the church to which he had so passionately devoted himself. Accordingly he soon became marked out for arduous work. Savoy was at this time greatly invaded by Calvinistic "heresies." The neighborhood of Geneva—a focus for the dissemination of Protestantism—and the political and military complications arising out of the hostile relations of the duke of Savoy and the king of France, all tended to the progress of Calvinism. Chablais had been invaded, and Protestant ministers long established at Thonon and other towns. For nearly sixty years in fact this region had been Protestant, and the people by express stipulation enjoyed the exercise of the Reformed religion. A missionary of apostolic fervor and courage was required to recover the lapsed district to the Catholic faith, and all eyes were turned to the young provost of Geneva as the only man fitted to grapple with the exigences of the position. His father as usual was the obstacle. He entreated his son not to expose himself to the dangers of such a mission, but Francis felt the call within him, and calmly replied, "I cannot refuse to obey, 'Wist ye not that I must be about my Father's business?'" The result was that he gave himself for four years (1594–1598) to laborious and self-denying work in the district, often, it is said by his flattering biographers, preaching and administering the offices of his church at the peril of his life. His persuasive eloquence and the apostolic simplicity of his life were at first unsuccessful. The inhabitants of Chablais remained hardened in Protestantism. But more violent measures, some of them reflecting little honor on Francis, at length succeeded in reclaiming the district to the Catholic faith. His success in this work led the pope to believe that he might gain over Calvin's celebrated successor, Theodore Beza; and lengthened conferences were held between the Protestant teacher and the Roman Catholic missionary, but without result. In 1598 Francis was appointed coadjutor bishop of Geneva, and became the official companion, as he had long been the warm friend, of Claude de Garnier, the aged bishop who had fostered his talents and largely shaped his career. Some years after this, in 1602, he spent some time in France and especially in Paris, where his preaching attracted great crowds, and his influence was felt from the court of Henry IV. to the poor sisters at Port Royal. Before St. Cyran became the spiritual leader of Angelique Arnaud and other of the devoted band which gathered around him, Francis had given a definite direction to her thoughts and aspirations. It is not the name of Angelique Arnaud, however, but that of another celebrated pietist, who was destined to be associated with Francis de Sales. Shortly after his succession to the bishopric by the death of his aged friend, he met at Dijon Madame de Chantal, a character of rare enthusiasm and devotion, whose spirit had been greatly chastened by the loss of her husband and child. She put herself under his direction, cut off her beautiful hair, and clothed herself as a religieuse. Her good works were incessant, and she became known as the "Sainte de Monthélon." At length Francis prepared a mission for her. Submitting her saintly obedience to various tests, he intimated his decision that she was destined to establish an order for the relief of the sick and the poor, the only rules for which were to be "charity and the love of Jesus Christ." The order was not fully established till 1610, but gradually acquired great influence. The relation of the saint to Madame de Chantal and other devout ladies has been much canvassed. There was a good deal of spiritual coquetry in it, and some of his letters to them contain doubtful sentiments; but there is no reason to doubt the purity of his character, and that his main object was to promote what he considered to be the interests of religion. He liked to be "surrounded by women," but chiefly that he might influence them for the good of the church. In 1608 Francis published his best known and most valuable work, the *Introduction à la Vie Dévote*, the circulation of which was immense. He became famous through all the Catholic world. Henry IV. sought to tempt him by a French bishopric; but he remained true to the country of his birth, and the comparatively quiet and unambitious life he was able to continue there. Loving, as all men of his temperament and religious attractiveness more or less do, to impress the force of his mind and character upon others, he yet seems to have been honestly free from vulgar ambition. He was a true priest, and found ample gratification in the diffusion of the spiritual charm and potency which radiated from his character and writings. His apparent simplicity was one of the most powerful elements of the wide influence which he exerted. Both as a preacher and as a writer a certain overweening "sweetness" may be said to be his marked characteristic,—a sweetness at times not without duplicity and a taint of cold-blooded fanaticism. Possessing singular graces of character, he was yet above all things an ecclesiastic, and had few scruples in serving the interests of his order and church. Superior to the coarser aspirations and the more commonplace ambitions of his time, he was yet often a subtle politician in the guise of a saint; and if his animating aim was to rule hearts rather than possess for himself a great position, the means by which he sought to do so were in many cases more adroit than magnanimous. He died in the end of 1622, and was canonized in 1665.

In addition to the *Introduction à la Vie Dévote* already mentioned, which has been translated into all languages, St. Francis de Sales published other works, especially a *Traité de l'Amour de Dieu*. His complete works were published in 17 vols. in 1835. There are elaborate lives of St. Francis in French by the Abbé Marsollier and Loyau d'Amboise. There is also an interesting but rather highly colored life of the saint (Sears's *Christian Biographies*, 1877) by the writer of the lives of Bossuet and Fénelon, who has likewise translated his *Spiritual Letters*. (J. T.)

FRANCIS, Sir Philip (1740–1818), a conspicuous Whig politician and, even apart from his supposed connection with the *Letters of Junius*, a powerful pamphleteer, was born in Dublin on the 22d of October, 1740. He was the only son of Dr. Philip Francis, a man of some literary celebrity in his time, who is still known by his translations of Horace, Æschines, and Demosthenes. He received the first rudiments of an excellent education at a free school in Dublin, and afterwards spent a year or two (1751–2) under his father's roof at Skeyton rectory, Norfolk, with Edward Gibbon as a fellow-pupil. In March, 1753, he entered St. Paul's school, London, where he remained for three years and a half, and became head boy. Here Henry Sampson Woodfall and Philip Rosenhagen were for some time his companions. In 1756, immediately on his leaving school, he was appointed to a junior clerkship in the secretary of state's office by Mr. Henry Fox (afterwards Lord Holland), with whose family Dr. Francis was at that time on intimate terms; and this post he retained under the succeeding administration. In 1758 he was employed as secretary to General Bligh in the expedition against Cherbourg; and in the same capacity he accompanied the earl of Kinnoul on his special embassy to the court of Portugal in 1760. In 1761 he became personally known to Pitt, who, recognizing his ability and discretion, once and again made use of his services as private amanuensis. In 1762 he was appointed to a principal clerkship in the war office, and in the same year he married Miss Macrabie, the daughter of a retired London merchant. The union was not approved by his father and led to some estrangement; but it does not appear to have been on the whole unhappy. The ten years which followed are very obscure, and a long-continued and close scrutiny by numerous and skilful investigators has led to few definite results, beyond the certain conclusion that the events of this period in the life of Francis must have been such as to have wielded a singularly commanding influence over all his subsequent conduct and career. Comparatively humble in position, and somewhat straitened in means, he had few opportunities of mingling familiarly in the society of the great; but his official duties brought him into direct relations with many who were well versed in the politics of the time, while he all along enjoyed a peculiar intimacy with Calcraft, the rich army agent, who has been described as having been Chatham's "wire-puller and political agent as well as informant." Public events of great interest took place during these years. It was in 1763, for example, that the great constitutional questions arising out of the arrest of Wilkes began to be so sharply canvassed. It was natural that Francis, who from a very early age had been in the habit of writing occasionally to the newspapers, should be eager to take an active part in the discussion, though his position as a Government official made it necessary that his intervention should be carefully disguised. He is known to have written to the *Public Ledger* and *Public Advertiser*, as an advocate of the popular cause on many occasions about and after the year 1763;[1] he frequently attended debates in both Houses of Parliament, especially when American questions were being discussed; and between 1769 and 1771 he is also known to have been favorable to the scheme in which Calcraft and others were engaged for the overturn of the Grafton Government and afterwards of that of Lord North, and for persuading or forcing Lord Chatham into power. In January, 1769, the first of the *Letters of Junius* appeared, and the series was continued till January 21, 1772. They had been preceded by others under various signatures, which, however, are all attributed to one and the same hand. The authorship of these letters has been assigned to Francis on a variety of grounds; but it must be said that the evidence is still only of the circumstantial kind, and far from conclusive (see JUNIUS). It ought to be mentioned here that, so far as can be ascertained, no one of his intimate friends suspected him at the time to be Junius, and also that he himself in after life energetically denied the charge. There was, however, it must be added, every motive for concealment on his part, both at the time and afterwards, if he was indeed the writer of the *Letters*.

In January, 1772, the office of deputy secretary in the war office became vacant, and the post was offered by Lord Barrington to Francis, who declined it. By a curious coincidence the last letter of Junius appeared on the very day in which Anthony Chamier was gazetted deputy secretary (January 21st). Two months afterwards Francis finally left the war office. "It is my own act," he wrote to an intimate friend. "Be not alarmed for me. Everything is secure and as it should be!" In July of the same year he left England for a tour through France, Germany, and Italy, which lasted until the following December. On his return he was, according to an autobiographical fragment which has been preserved, contemplating emigration to New England, when, in June, 1773, Lord North, on the recommendation of Lord Barrington, appointed him a member of the newly constituted supreme council of Bengal, at a salary of £10,000 per annum. Along with his colleagues Monson and Clavering he reached Calcutta in October, 1774, and a long struggle with Warren Hastings immediately began. That struggle passed through three phases, during the first of which, until the death of Monson in 1776, Francis had the majority of votes in the council; afterwards, until the arrival of Wheler in December, 1777, he was continually overborne; while, during the remaining three years, forces were more evenly balanced, Hastings having on the whole the preponderance. A dispute, more than usually embittered, led in August, 1780, to a minute being delivered to the council board by Hastings, in which he stated that "he judged of the public conduct of Mr. Francis by his experience of his private, which he had found to be void of truth and honor." A duel was the consequence, in which Francis received a dangerous wound. Though his recovery was rapid and complete, he did not choose to prolong his stay abroad. He arrived in England in October, 1781, and was received with little favor. Little is known of the nature of his occupations during the next two years, except that he was untiring in his efforts to procure first the recall and afterwards the impeachment of his hitherto triumphant adversary. It may be mentioned, as a curious coincidence at least, if nothing more, that the "bookseller's edition" of *Junius*, described on the title page as more complete than any yet published, appeared in 1783. In the same year Fox produced his India Bill, which led to the overthrow of the coalition Government. In the general election of April, 1784, Francis was returned by the borough of Yarmouth, Isle of Wight, and his first appearance in the house was made in the following July, when the financial affairs of the East India Company were under discussion. On this occasion he took an opportunity to disclaim every feeling of personal animosity towards Hastings. This did not prevent him, however, on the return of the latter, in 1785, from doing all in his power to bring forward and support the charges which ultimately led to the impeachment resolutions of 1787. Although excluded by a majority of the House from the list of the managers of that impeachment, Francis was none the less its most energetic promoter, supplying his friends Burke and Sheridan with all the materials for their eloquent orations and burning invectives. At the general election of 1790 he was returned a member for Bletchingley. In common with all English politicians he found his attention very strongly called to the events which were then occurring in France; his sympathies were strongly with the revolutionary party, and he opposed in parliament all the measures of the Government against reformers and Jacobins at home. In 1793 he supported Mr. (afterwards Lord) Grey's motion for a return to the old constitutional system of representation, and so earned the title to be regarded as one of the earliest promoters of the cause of parliamentary reform. He rendered further services to the same cause by repeated vindications of the Society of the Friends of the People in the days of its unpopularity. The acquittal of Hastings in April, 1795, again disappointed Francis of the governor-generalship, and in 1798 he had to submit to the additional mortification of a defeat in the general election. He was once more successful, however, in 1802, when he sat for Appleby, and it seemed as if the great ambitions of his life were about to be realized when the Whig party came into power into 1806. His disappointment was great when the governor-generalship was, owing to party exigences, conferred on Sir Gilbert Elliot (Lord Minto); he declined, it is said, soon afterwards the government of the Cape, but accepted a knight companionship of the order of the Bath. Though re-elected for Appleby in 1806, he failed to secure a seat in the following year; and the remainder of his life was spent in comparative privacy. In 1814 he married his second wife, Miss Emma Watkins, who long survived him, and who has left voluminous manuscripts relating to his biography. He died on the 23d of December, 1818.

Among the later productions of his pen were, besides the *Plan of a Reform in the Election of the House of Commons*, a pamphlet entitled *Reflections on the Abundance of Paper in Circulation and the Scarcity of Specie* (1810), and a *Letter to Earl Grey on the Policy of Great Britain and the Allies towards Norway* (1814). His *Memoirs, with Correspondence and Journals*, commenced by the late Joseph Parkes, and completed and edited by Mr. Herman Merivale, were published in two volumes in 1867. They help the reader to form a tolerably vivid conception of the man, and show that in his domestic relations he was exemplary, and that he lived on terms of mutual affection with a wide circle of friends. They indicate at the same time, however, that he was far from incapable of vindictiveness, dissimulation, and treachery. His biographers are firmly convinced of his identity with Junius, and bring a great body of circumstantial proof in support of their belief.

FRANCISCANS. The Franciscan orders include the three orders of the Minorites, and all the less important associations who trace their rule to Francis of Assisi. The three orders of the Minorites, or Franciscans proper, include (1) the Minorite friars, properly so-called, under a succession of generals of the whole order from the foundation; (2) the order of the Poor Ladies or Poor Clares—the Franciscan nuns; (3) the order of Penitent Men and Women, which includes (*a*) all those who dwell in

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[1] A letter in the *Public Ledger* (March, 1763) signed "One of the People," in which the popular cause is supported in a contest that had arisen between the public and the proprietors of Drury Lane and Covent Garden theatres, is among the earliest known productions of his pen. There is strong evidence that he was the author of the "Candor" pamphlet (September, 1764), in which the verdicts obtained by the Government against the printers of the *North Briton* for libel in "No. 45" are condemned. With regard to the "Anti-Sejanus" letters (January and February, 1766), written in condemnation of the American policy of the Rockingham ministry, Parkes affirms that "the most sceptical cannot doubt that they emanated from his pen;" but Merivale brings evidence to show that, if so, he must at least have had colleagues in writing them. The communication in the *Public Advertiser* (June, 1768), signed "A Friend to Public Credit," is undoubtedly attributable to him. There is some likelihood also that sundry letters to the *North Briton* and other periodicals (1768-70), copies of which have been found among his papers corrected and punctuated by himself, may have been his contributions.

Franciscan cloisters and keep the third rule, (*b*) those who live in cloisters of their own, keeping the third rule, and (*c*) the Tertiaries properly so-called. All these three orders of Friars, Nuns, and Tertiaries are more or less under the jurisdiction of the general-minister of the Francisan order.

I. The Minorite friars, or the first order, are divided into two "families," Cismontana, or convents in Italy, Germany, Hungary, Poland, Syria, and Palestine, and Ultramontana, or convents in France, Spain, the Low Countries, Saxony, the Islands of the Mediterranean, Africa, Asia, and the Indies—the one ruled directly by the minister-general, and the other by a commissary-general. Each family is divided into provinces ruled over by a provincial. The Cismontane has sixty-six provinces, and the Ultramontane has eighty-one. A province is the union of a certain number of convents under a chief directly responsible to the minister-general. Besides provinces the order originally contained *vicarates* and *custodia*. The vicarates were a number of convents united together, but too few to be counted a province. The custodia were at first subdivisions of provinces, but since Leo X. the custodia are like the old vicarates, and are governed by a vicar or custos directly responsible to the minister-general. The convents of the order *in partibus infidelium* are governed by prefects. The minister-general is chosen in full chapter for a term of six years, and if he dies or removes to a higher office during his term, the "discreet perpetual fathers" choose a deputy for the remainder of the term. The minister-general is chosen from the two families alternately, and the chapter at the same time elects a commissary-general for the other family.

The rule originally prescribed by St. Francis was very strict, and, rigidly enforced, would have made all the members of the order pious beggars. This was the founder's idea, but when the order became popular it was found that few of its members could act up to its requirements; and even in the life-time of the founder attempts were made to relax them. The relaxations sanctioned by the decrees of popes and by general usage were repeatedly fought against by small but zealous minorities, and these struggles gave rise to various divisions in the order. Since the time of Leo X. and his union bull these divisions have been reduced to three,—the Observants, the Conventuals, and the Capuchins,—all of whom belong to the first order of the Franciscans; and they are the survivals of a much more numerous division. The Observants are supposed to keep the rule of Francis with some strictness, and they take the first rank among the Franciscans; their minister-general has pre-eminence. The Conventuals follow the rule of Francis with certain relaxations permitted by successive popes. Their general has to be confirmed by the great minister-general, but otherwise they are independent. Since 1528 the Capuchins have had an independent general under the minister-general.

1. *The Observants.*—The relaxation of the rule of Francis and attempts at reformation to the original simplicity and strictness date from the time of Elias, successor as minister-general to Francis himself. Some of these reforms were unsuccessful, and only resulted in small schisms condemned by the general and by the pope; others were successful, and resulted in the formation of separate congregations more or less independent, until they were all abolished or rather brought together under one rule by Leo X. The *Cæsarins* were the followers of Cæsarinus of Spires, who revolted against the relaxations and innovations of Elias. After varying fortunes the reformers were punished as rebels. They gradually returned to the ranks of the order, and ceased to exist separately in 1256. The *Celestines* were the followers of Peter of Macerata, who called himself Liberatus, and Peter of Fossombrone, called Angelus, from his frequent fellowship with angels. They taught and professed a life of the strictest poverty and solitude, and were permitted to live separately from the rest of the order by Pope Celestine V. in 1294. The permission was recalled by later popes, and after many struggles the Celestine hermits were reckoned schismatics and heretics (see CELESTINES). From them came the Fratricelli (see FRATRICELLI). The *Congregation of Narbonne*, the Spirituales, were mainly followers of Peter John de Oliva. They were really a branch of the Celestines settled at Narbonne; but their special grievances were that their laxer brethren did not wear the clothes prescribed by Francis,—their robes were too long and too rich, and their hoods too large,—and that they accepted presents of wine and corn during the vintage and harvest. After some struggles they forced on a controversy in 1282, and were finally condemned by John XXII. at Vienna in 1312. They refused to submit, and were pronounced schismatic in 1318. The *Clarenins* were a revival, in 1302, of the Celestine hermits under Angelus of Cordova. They fought for recognition and existence down to 1581. The *Congregation of Philip of Majorca* arose in 1308. They were refused recognition, but struggled on only to disappear among the fanatical schismatics of the period. The reform of John of Vallées and Gentilis of Spoleto was occasioned by a further relaxation of the rule in 1336, sanctioned by Pope Benedict XII. Their fight for existence lasted almost forty years.

These six attempts to return to the original rule of St. Francis, and to follow in the letter and spirit his principles of a religious life, were all unsuccessful. The historians of the order ascribe the failures to the rashness of the reformers or their followers, but the real cause was the utter incompatibility of the rule of Francis with social life in any form. Any thorough-going return to the primitive rule was impossible, but many partial reforms were attempted. The aim of each reformer was to reconstruct the society, or at least to found a small society, which would be so independent of the rules and officials of the Franciscan order as to be free from interference with their endeavors to obey the rule of Francis in their own way. Some of these reforms achieved a very considerable degree of independence, and lasted for a long time. They were all, nominally at least, brought under the common government of the order by the famous union bull of Pope Leo X. Of these reforms the most important are the following:—

The Soccolantes (named from wearing a wooden sandal), were founded by Paul of Foligny in 1368, noted from his fourteenth year for his enthusiastic piety. This is the most important, because it started with the principles of the earlier unsuccessful reforms, and succeeded because it professed unconditional submission to the pope. Paul and his companions showed all the idiosyncrasies of Francis: their cells were full of frogs, and their beds of serpents; they rejoiced in ill health, and nausea at the sight of food was esteemed a sign of the complete mortification of the body. They obtained permission, and retained it against many attempts at deprivation, to live in independence of the ordinary officials of the order. Their reform became successful and spread, and when Leo X. issued his bull of union they were sufficiently numerous to impose their name (*Observantes*) on one of the great divisions of the reorganized order. At the first they held disputations with the Fratricelli and Beghards regarding the principles of Francis, for these heretics with great justice declared that they were more true to the Christian ideal of Francis than the professed followers of the saint. The only argument the Observants could adduce against their opponents was that Francis had made unconditional submission to the pope part of his ideal.

The congregation of Villacrezes was founded by Peter of Villacrezes, in the convent of Our Lady of Salceda in Castile, about 1390,. His principles were very like those of Paul of Foligny, but were even more strictly enforced. The brethren were obliged to wear the scantiest and coarsest raiment, and to content themselves with the barest necessaries of life. The independence of the congregation was finally secured at the council of Constance. (*Cf.* Mendoza, *Hist. del Monte Celia de nuestra Señora de la Salceda.*)

The Congregation of Collette, from the nun Collette, is noticed below.

The congregation founded by Amadeus of Assisi obtained independence in 1469 and 1471; it was never very strong, labored under suspicion of heresy, refused to submit to the bull of Leo X., and was finally suppressed by Pius V.

The congregation of Philip Berbegal took its rise from attempts of Martin V. to reform the order in 1430. Nominally suppressed in 1433, it reappeared under another name (the Neutrals), obtained recognition, but was finally suppressed in 1463.

The Caperolani, or followers of Peter Caperole, were for a short time independent, and then were reunited with the Observants. Two famous preachers, Anthony of Castel St. Jean and Matthew of Tivoli, held out and gathered around them a new congregation, which for long refused to submit itself to the order.

More important, however, than any of these reforms, save the first, were the series of national reformatory movements within the order, which produced in Spain the Bare-footed Friars under the leadership of John of Guadaloupe, in Italy the Riformati led by Stephen Molina, and in France the Récollets. These congregations arose to embody the reforms suggested by John of Puebla, and survived Leo's bull of union. Lapse of time brought relaxations, and these led again to a reaction which produced the reform of Peter of Alcantara, who named his fellows The Brethren of the Strictest Observance. Peter obtained a species of independence for his convents. They were under the rule of the general of the order, but not of the provincials. From this congregation arose a further reform under John of Paschase and Jerome of Lanza, which, after some years of independent life, reunited with the congregation of Peter of Alcantara.

Most of these reforms were brought together by the bull of Leo X., and are merged under the general name of Observants.

2. The *Conventuals* included, at the time of Leo X., all the Franciscans who kept the rule in a relaxed form, and had not been influenced by the various attempts at reformation. They claimed to be *the* Franciscan order, and in fact at the time were so. Now they are only one of the great divisions of the order. An attempt was made after the council of Trent to reform the Conventuals, and a congregation of Reformed Conventuals was founded, but it did not exist very long.

3. The *Capuchins* exist as an independent congregation, and do not take rank with the Observants and Conventuals. They owe their origin to Matthew of Bassi, a Franciscan of the family of Observance, who had conscientious scruples about the shape of his hood or capuce. It was revealed to him in visions that St. Francis had worn a long pointed hood, and he began to wear one of the revealed pattern. Others began to copy it. They were persecuted by their fellows, strove for freedom, and at length got it. In 1536 Paul III. formally recognized them under the title of Capuchins of the order of the Minorites, but ordained that their vicar-general or chief was to be confirmed by the general of the Conventuals, and that they were to march under the cross of the Conventual Minorites in religious processions. In 1619 Paul V. removed these restrictions. They now have their own cross and choose their own chief quite independently, and he is called general, not vicar-general. See CAPUCHINS.

II. The Franciscan nuns owed their origin to Clara, a noble maiden of Assisi. Born in 1193, she left her home in 1212, fled to the Portiuncula to Francis, and refused to return. The same year she gathered a company of ladies, including her three younger sisters, and founded the order of Franciscan nuns. The order spread rapidly through Italy, France, Spain, Germany, and Bohemia. In 1220 Cardinal Hugolin gave them a rule of life taken from the rule for the strictest sect of the Benedictine nuns, with some special observances. Four years later Francis gave them a written rule, which was approved of by Gregory IX. and by Innocent IV.

The rule of Hugolin compelled the nuns among other things to fast every day, to abstain at all seasons on Wednesdays and Fridays from wine and soup, and to content themselves on those days with some fruits or raw herbs, to fast also on bread and water thrice a week during Lent and twice during Advent. They were also to keep perpetual silence, to be broken only by the permission of the superior. They were to wear two tunics, a mantle and scapulary, besides a hair shirt. The rule of Francis was not so strict; he did not oblige them to fast on bread and water during certain seasons, and there were other relaxations. These two rules gave rise to disputes and divisions, and Pope Urban IV. gave the sisters a third rule which was less strict than either. The result was that several convents adhered to the first and strictest rule; that of the reform of Collette, a French sister, adhered to the second rule, that of Francis; while the large proportion of the nuns followed the new rule of Urban.

The Capuchin movement within the Franciscan order also affected the Minorite nuns, and the Capuchin nuns soon became a large and prosperous community. The only other important reform was that set in motion by Peter of Alcantara. The sisters who followed him are called the Poor Clares of the Strictest Observance. They take the vow of perpetual silence.

III. The Tertiaries consist of lay brethren and sisters in the Franciscan monasteries, confraternities who keep the third rule of St. Francis, and men and women living in society who have taken the third rule. The Tertiaries of the begging monks have become so famous that many are disposed to trace their origin to Francis and Dominic, but the class of penitents existed in connection with other and older orders. The third rule was intended to suit the requirements of all those who wished to live a higher religious life, and who could not from their circumstances embrace the monastic life. It is said that the origin of the Franciscan Tertiaries dates from Francis preaching at Canari, a small town near Assisi, where the whole population wished *en masse* to enter the Franciscan order and desert their life and duties in society. Francis refused to permit this, but to assist them framed a third rule to serve as a religious guide. Its provisions resemble the rules commonly found in pious books with which the present ritualistic movement has made us familiar, and the associations of Tertiaries may be compared with the guilds now found in connection with many High Church congregations. These Tertiaries believed that they were imitating not Christ but his early disciples; they had to spend some time in novitiate, and then vowed obedience to the third rule, which enjoined that they were to wear poor clothing of an unobtrusive color, without worldly ornament of any kind. It forbade them to bear arms save for the defence of the church or their country. It prohibited attendance at fêtes, balls, dancing parties, and the theatre. It forbade meat on Monday, Wednesday, Friday, and Saturday. It enjoined fasting at Lent and Advent, and at other times only two meals a day. The hours of devotion and the devotional exercises were prescribed. Tertiaries were bound to attend mass and preaching at least once a month, to go to confession and holy communion at least thrice a year, and to attend the funerals of their fellows. This third order was very successful, but it is worth noticing that the common people, after the first burst of enthusiasm, seemed unable to distinguish the Tertiaries from the Fratricelli and Beghards, who professed a somewhat similar mode of life, and had been condemned by various popes.

At some period of their existence, when it is difficult to say, many of the Tertiaries began to practise the monastic life, and to take the vow of chastity in addition to the third rule. Convents of the third rule were in existence in the 15th century, and in 1433 brethren living under this rule were permitted to choose a general. The earlier bulls permitting such confraternities were at first generally addressed to penitents living in particular countries, and the divisions of the brethren take generally a local name. There were, for example, the religious penitents of the third order of St. Francis of the regular observance in Italy, in Sicily, Dalmatia, and Istria, and in the Low Countries; these three were united in the congregation of Lombardy. There were besides the congregations of Germany, Spain, Portugal, and France. Congregations were also formed to observe the rule with complete and literal strictness. The Tertiaries included women as well as men, and these also began to take a special vow of chastity and live in cloisters. One branch of these includes the lay sisters in the ordinary convents of the Poor Clares, who devote themselves to menial work. Their foundress was Elizabeth of Hungary. Another branch was founded by Angeline of Corbaro, and has convents of its own. There are also the Gray Sisters, the Recollectines, and several other congregations, who live in cloisters under regular government, but practise the third and not the second rule. From the beginning of the movement the Tertiaries were charged to take special care of the poor, the sick, and the aged; and several confraternities, both of men and of women, have been formed, who live under the third rule, and devote themselves to hospital work.

Besides these three orders of Friars, Nuns, and Tertiaries, the Franciscans may also be said to include one or two orders of minor importance which trace their origin to Francis,—such, for example, as the Chevaliers of the Order of the Immaculate Conception of the Blessed Virgin, and the Archiconfraternity of the Stigmata of St. Francis, but they are of minor importance.

The Franciscan soon became one of the most important of the mediæval monastic orders. It had a peculiar character, and attracted minds of the sympathetic mystical cast. This led to its curious connection with many of the mediæval heretical sects. The Franciscan theology was also peculiar. It had the same Pelagian characteristics that distinguish the modern Jesuit theology, which has done little more than develop the Franciscan ideas on the immaculate conception, the doctrines of freedom and grace, etc. During the Middle Ages, the Franciscans, however, furnished many strong opponents to the papal theology and ecclesiastical claims. The order has produced a long array of distinguished theologians and churchmen,—Bonaventura, Alexander of Hales, John Duns Scotus, and William of Occam were all Franciscans. Wadding, the great historian of the Franciscans, has filled a folio volume with names of distinguished members of the order.

Authorities.—Wadding, *Annales Minorum*, 22 vols. fol., and Brother Anthony's *Supplement;* Tossinian, *Historia Seraphica;* Dominic de Gubernatis, *Orbis Seraphicus;* Helyot, *Histoire des Ordres Monastiques*, vol. vii.; Marianus, *Chronic. Observ. Strictior. et Reform.;* Boverius, *Annal. Fr. F. Min. Capucinorum;* Brewer's *Monumenta Franciscana;* Hase, *Franz v. Assisi, ein Heiligenbild*, 1864; Mrs. Oliphant's *Life of Francis of Assisi;* Maclear's *History of Christian Missions in the Middle Ages* (where the mission work of St. Francis has been well described, chap. 16); Mrs. Jameson's *Legends of the Monastic Orders as represented in the Fine Arts;* Milman's *Latin Christianity*, bk. ix. chap. 9. (T. M. L.)

FRANCISQUE. Jean François Millet (*c.* 1644–1680), commonly called Francisque, was born at Antwerp about 1644, and is generally classed amongst the painters of Flanders on account of the accident of his birth. But his father was a Frenchman, a turner in ivory of Dijon, who took service with the prince of Condé, and probably returned after a time to his native country. He remained long enough in Antwerp to apprentice his son to an obscure member of a painter family called Laurent, pupil of Gabriel Franck. With Laurent Franck Francisque left Antwerp for Paris, and there settled after marrying his master's daughter. He was received a member of the Academy of Painting at Paris in 1673, and after gaining consideration as an imitator of the Poussins he died in 1680, bequeathing his art and some of his talents to one of his sons. Francisque probably knew, as well as imitated, Nicolas Poussin, Gaspar Dughet, and Sebastian Bourdon; and it is doubtless because of his acquaintance with these travelled artists that, being himself without familiarity with the classic lands of Italy and Greece, he was able to imagine and reproduce Italian and Arcadian scenery with considerable grace and effectiveness. It is indeed surprising to observe, even at this day, how skilfully he executed these imaginary subjects, enlivened them with appropriate figures, and shed over them the glow of a warm yet fresh and sparkling tone. Unhappily time has been unkind to Francisque. Twelve of his most important landscapes, which remained in the palace of the Tuileries, were destroyed by fire quite recently; and though many of his pieces may still be found catalogued in Continental and English collections, others in great number remain unknown and unacknowledged. In England there are specimens of Francisque in the galleries of the duke of Devonshire, and Earls Dudley and Suffolk. Abroad, most of his known works are in public museums. It often happens that his name is appended to pictures by Jean François, his son.

Jean François Millet, the younger, was born in Paris, and was made a member of the Academy of Painting at Paris in 1709. He died in 1773. He is not quite so independent in his art as his father; but he had clever friends, and when he wanted figures to his landscapes, he consulted Watteau, and other followers of the "court shepherdess" school. But on the whole Jean François the younger's work is often lost in that of his father, and it is difficult to point to any picture by him except that in the museum of Grenoble, which is prettily adorned with Watteau's figures.

FRANCK. The name of Franck has been given indiscriminately but improperly to painters of the school of Antwerp who belong to the families of Francken and Vranex (see Francken and Vranex). One artist truly entitled to be called Franck is Gabriel, who entered the guild of Antwerp in 1605, became its president in 1636, and died in 1639. Gabriel Franck formed a great number of pupils, amongst whom we notice Abraham Genoels the elder, and Laurent Franck, the master of Francisque. But none of his works are now to be traced.

FRANCK or FRANK, Sebastian (*c.* 1500–1543), not unfrequently called by the Latinized form of his name *Francus*, an important German writer of the Reformation period, was born about 1500 at Donauworth, and regularly styled himself Franck of Wörd. Of his early years nothing is known except by inference. It appears that he studied at Heidelberg, and about 1524 was ordained a Roman Catholic priest. In 1528 he married Ottilia Behaim at Nuremberg; and the same year he produced his German translation of Althamer's *Diallage, or Reconciliation of the Contradictions of the Scriptures*, and wrote a treatise against the *Horrible Vice of Drunkenness.* Two years later appeared, with an introduction by Luther, his translation of a *Chronicle and Description of Turkey, written by a Transylvanian who had been Twenty-two Years in Turkish Captivity.* In 1531 he was in Strasburg, and published his *Chronika, Zeitbuch, und Geschichtbibel*, one of the first German works in which an attempt was made to give a survey of universal history. From Strasburg he removed to Esslingen; and there during 1532 and 1533 he attempted to support himself by soap-boiling, but found it on the whole an unprofitable occupation. In hope of a better market for his wares he went to Ulm, where in 1534 he received the freedom of the city. For some time he remained peacefully printing his books, but on the publication of his *Parodoxa* his privileges were withdrawn, and he was ordered to depart. A promise to submit his writings to censure procured a temporary reprieve of the sentence. but in 1539 he was finally banished, and from that time he appears never to have settled long in one place. He was engaged as a printer and publisher at Basel when he died, in 1543 or 1545. Besides the works already mentioned, he wrote also a collection of proverbs (*Spruch-Wörter*) in 1532, which appeared in fuller form in 1591, a *Germaniæ Chronicon*, 1538, and the *Guldin Arch* or *Arca Aurea*, 1538, a collection of Scripture doctrines with proof passages, not only from the Bible itself, but also from pagan writers. Franck's position as a thinker was a peculiar one. Though associated at first with the Reformers, he soon showed that he was out of sympathy with their dogmatic tendencies, and at length was branded by Luther as a "devil's mouth." He was naturally inclined to subjectivity and mysticism, and may to a certain extent be regarded as a forerunner of modern German idealism. His religion was practically pantheistic, and tended to foster a spirit of tolerance that found good in everything. Amid the bitter controversies of contending sects it was rare to find a professed theologian maintaining that the true church consisted of "all pious and good-hearted men in all the world, even among the heathen." As an historian, while still credulous enough to believe in the Trojan myths of the Middle Ages, he displayed a remarkably modern spirit in the attention he gave to social conditions. The first part of his *Chronicon*, etc., contains the history of antiquity, the second includes the period from Christ to Charles V., and the third gives account of the popes, councils, heretics, ceremonies, etc. His German style is plain, vigorous, and idiomatic, and ranks him high among the founders of German prose.

See Wald, *De vita Franci*, Erlangen, 1793; Ch. K. am Ende, *Nachlese zu Franck's Leben und Schriften*, Nuremberg, 1796; Hagen, *Geist der Reformatoren und seine Gegensätze*, Erlangen, 1844; Heinrich Merz in Herzog's *Real Encyclopädie für Prot. Theol.*, 1855; Bischof, *Sebastian Franck und die Deutsche Geschichtschreibung*, Tübingen, 1857; Hase, *Sebastian Franck von Wörd der Schwarmgeist*, Leipsic, 1869; Latendorf in his edition of *Sebastian Franck's erste namenlose SprUchwörtersammlung von Jahre 1532*, Posneck, 1876; and a valuable review of this last work in the *Jena Lit. Zeitung*, 1877, No. 22. A critical catalogue of the whole literature of the subject appeared in Birlinger's *Alemannia*, 1876.

FRANCKE, August Hermann (1663–1727), an influential German philanthropist and theologian, was born on the 22d of March, 1663, at Lübeck, where his father, a doctor of laws, at that time held a professional appointment. He was educated, chiefly in private, at Gotha (to which his family had removed in 1666), and afterwards at the universities of Erfurt, Kiel, and Leipsic. During his student career, he busied himself specially with the Hebrew and Greek languages; and in order to acquire the former more thoroughly, he for some time put himself under the instructions of Rabbi Ezra Edzardi at Hamburg, at whose instance he is said to have read through the entire Hebrew Bible seven times within a year. He graduated at Leipsic in 1685, but, having found employment as a "privat-docent," did not quit the university until the end of 1687. During the last year of his residence he had, by the help of his friend P. Anton, and with the approval and encouragement of Spener, who was at that time coming into notice, originated the afterwards famous collegium philobiblicum, at which a number of graduates were accustomed to meet for the regular and systematic study of the Bible. He next passed a number of months at Lüneburg as assistant or curate to the learned and pious superintendent Sand-hagen, and there his religious life was remarkably quickened and deepened. His own account of his experience at that crisis in his life, and of the influence of the particular text (John xx. 31) to which he believed he owed his conversion, is very interesting and characteristic. On leaving Lüneburg, he spent some time in Hamburg, where he was engaged as a teacher in a private school, and there also he considered himself to have acquired some experience which proved invaluable in after life. After a long visit to Spener, who was at that time in Dresden, and who encouraged him in the plans he had formed, he returned to Leipsic in the spring of 1689, and began to give Bible lectures of an exegetical and practical kind, at the same time resuming the collegia philobiblica of earlier days. He rapidly became very popular as a lecturer; but the peculiarities of his teaching almost immediately aroused a violent opposition on the part of the university authorities; and before the end of the year he was, on the ground of his alleged pietism, interdicted from lecturing. Thus it was that Francke's name first came to be publicly associated with that of Spener, and with one of the most fruitful church movements of the 17th century. Although, however, the majority of those claiming to be orthodox chose to regard the pietists as a new and dangerous sect, it must be remembered that neither Spener nor Francke taught in any spirit of sectarianism or with any consciousness of antagonism to any of the doctrines of the Lutheran Church. Loyal churchmen, they were distinguished from other Lutherans simply by their readiness to subordinate mere confessional orthodoxy to the interests of spiritual religion and practical morality, and also by the unusual earnestness with which they insisted on the necessity of conversion, and of the appearance of certain symptoms of a moral and spiritual change, before any one could rightly lay claim to the Christian name. The pietism of Francke, at all events, was quite as compatible with churchliness as was the methodism of Wesley or the evangelicalism of Simeon; and it is well known that neither of these two men desired to set up a sect against the church. Prohibited from lecturing in Leipsic, Francke in 1689 found work at Erfurt as "deacon" of one of the city churches. Here his evangelistic fervor attracted multitudes to his preaching, but at the same time excited the jealousy of his less zealous colleagues as well as the antipathy of the Catholic section of the population; and the result of their combined opposition was that after a ministry of fifteen months, he was, in September, 1691, banished from the town by the civil authorities. The same year witnessed the expulsion of Spener from Dresden. In December Francke received and accepted an invitation to fill the chair of Greek and Oriental languages in the new university of Halle, which was at that time being organized by the Elector Frederick III. of Brandenburg; and at the same time, the chair having no salary attached to it, he was appointed minister of the parish of Glaucha in the immediate neighborhood of the town. Here, for the next thirty-six years, he continued to discharge the twofold office of pastor and professor with rare energy and success. Besides preaching on Sundays, with an eloquence and earnestness and depth that attracted and held together a large congregation, he found time for many week day meetings for edification, and was unwearied in the work of catechising the young and of giving spiritual direction to those who sought his private advice. At the very outset of his labors, he had been profoundly impressed with a sense of his responsibility towards the numerous outcast children who were growing up around him in ignorance and crime. After a number of tentative plans, such as that of gathering them together once a week at the parsonage, and that of paying their school fees, he resolved in 1695 to institute what would be called in this country a ragged school, relying for funds upon the charity of the benevolent public. A single room was at first sufficient for the needs of the institution; but within a year it was found necessary to purchase a house, to which another was added in 1697. In 1698 there were 100 orphans under his charge to be clothed and fed, besides 500 children who were taught as day scholars. The later statistics of the many and various educational institutions of Halle which owe their origin to him will be found in vol. vii. p. 586. The principles there indicated were consistently applied in his university teaching. Even as professor of Greek he had given great prominence in his lectures to the study of the Scriptures; but he found a much more congenial sphere when, in 1698, he was appointed to the chair of theology. Yet his first courses of lectures in that department were on Old and New Testament introduction; and to this, as also to hermeneutics, he always attached special importance, believing that for theology a sound exegesis was the one indispensable requisite. "Theologus nascitur in scripturis," he used to say; but during his occupancy of the theological chair he lectured at various times upon other branches of the science also, according to the custom still usual in Germany. Amongst his colleagues were Anton, Breithaupt, and Joachim Lange—men like-minded with himself. Through their influence upon the students, Halle became a centre from which pietism, as it was called, became very widely diffused over Germany; but while in some quarters the new light was welcomed and cherished, in others every effort was made to suppress it. Thus, while Frederick William I. of Prussia is said to have gone so far as to issue an edict forbidding that any one should receive a cure of souls in his dominions who had not studied in Halle for two years, and received from the faculty there satisfactory certificates as to his status gratiæ, legislative enactments were elsewhere frequently directed against the Halle school. It ought to be borne in mind with reference to these that Francke cannot fairly be held responsible for the separatistic and perfectionist and chiliastic tendencies which are now most commonly associated with the pietistic name. He died at Halle on the 8th of June, 1727.

His principal contributions to theological literature were—*Manuductio ad Lectionem Scripturæ Sacræ* (1693); *Prælectiones Hermeneuticæ* (1717); *Commentatio de Scopo Librorum Veteris et Novi Testamenti* (1724); and *Lectiones Paræneticæ*, (1726–36). The *Manuductio* was translated into English in 1813, under the title *A Guide to the Reading and Study of the Holy Scriptures.* An account of his orphanage, entitled *Segensvolle Fuss-stapfen,* etc. (1709), which subsequently passed through several editions, has also been partially translated, under the title *The Footsteps of Divine Providence; or, The Bountiful Hand of Heaven defraying the Expenses of Faith.* See Guerike's *A. H. Francke* (1827), which has been translated into English (*The Life of A. H. Francke,* 1837); and Kramer's *Beiträge zur Geschichte A. H. Francke's* (1861), and *Neue Beiträge* (1875).

FRANCKEN. Eleven painters of this family cultivated their art in Antwerp during the 16th and 17th centuries. Several of these were related to each other, whilst many bore the same Christian name in succession. Hence unavoidable confusion in the subsequent classification of paintings not widely differing in style or execution. When Franz Francken the first found a rival in Franz Francken the second, he described himself as the "elder," in contradistinction to his son, who signed himself the "younger." But when Franz the second was threatened with competition from Franz the third, he took the name of "the elder," whilst Franz the third adopted that of Franz "the younger." It is possible, though not by any means easy, to sift the works of these artists. The eldest of the Franckens, Nicholas of Herenthals, died at Antwerp in 1596, with nothing but the reputation of having been a painter. None of his works remain. He bequeathed his art to three children. Jerom Francken, the eldest son, after leaving his father's house, studied under Franz Floris, whom he afterwards served as an assistant, and wandered, about 1560, to Paris. In 1566 he was one of the masters employed to decorate the palace of Fontainebleau, and in 1574 he obtained the appointment of court painter from Henry III., who had just returned from Poland and visited Titian at Venice. In 1603, when Van Mander wrote his biography of Flemish artists, Jerom Francken was still in Paris living in the then aristocratic Faubourg St. Germain. Among his earliest works we should distinguish a Nativity in the Dresden Museum, executed in co-operation with Franz Floris. Another of his important pieces is the Abdication of Charles V. in the Amsterdam Museum. Equally interesting is a Portrait of a Falconer, dated 1558, in the Brunswick Gallery. In style these pictures all recall Franz Floris. Franz, the second son of Nicholas of Herenthals, is to be kept in memory as Franz Francken the first. He was born about 1544, matriculated at Antwerp in 1567, and died there in 1616. He, too, studied under Floris, and never settled abroad, or lost the hard and gaudy style which he inherited from his master. Several of his pictures are in the Museum of Antwerp, one, dated 1597 in the Dresden Museum represents Christ on the road to Golgotha, and is signed by him as D. c̃ (Den ouden) F. Franck. Ambrose, the third son of Nicholas of Herenthals, has bequeathed to us more specimens of his skill than Jerom or Franz the first. He first started as a partner with Jerom at Fontainebleau, then he returned to Antwerp, where he passed for his guild in 1573, and he lived at Antwerp till 1618. His best works are the Miracle of the Loaves and Fishes and the Martyrdom of St. Crispin, both large and ambitious compositions in the Antwerp Museum. In both these pieces a fair amount of power is displayed, but marred by want of atmosphere and shadow, or by hardness of line and gaudiness of tone. There is not a trace in the three painters named of the influence of the revival which took place under the lead of Rubens. Franz Francken the first trained three sons to his profession, the eldest of whom, though he practised as a master of guild at Antwerp from 1600 to 1610, left no visible trace of his labors behind. Jerom the second took service with his uncle Ambrose. He was born in 1578, passed for his guild in 1607, and in 1620 produced that curious picture of Horatius Cocles defending the Sublician bridge which still hangs in the Antwerp Museum. The third son of Franz Francken the first is Franz Francken the second, who signed himself in pictures till 1616 "the younger," from 1630 till his death "the elder" F. Francken. These pictures are usually of a small size, and are found in considerable numbers in Continental collections. Franz Francken the second was born in 1581. In 1605 he entered the guild, of which he subsequently became the president, and in 1642 he died. His earliest composition is the Crucifixion in the Belvedere at Vienna dated 1606. His latest compositions as "the younger" F. Francken are the Adoration of the Virgin (1616) in the Gallery of Amsterdam and the Woman taken in Adultery (1628) in Dresden. From 1616 to 1630 many of his pieces are signed F. Francken; then come the Seven Works of Charity (1630) at Munich, signed "the elder F. F.," the Prodigal Son (1633) at the Louvre, and other almost countless examples. It is in F. Francken the second's style that we first have evidence of the struggle which necessarily arose when the old customs, hardened by Van Orley and Floris, or Brueghel and De Vos were swept away by Rubens. But F. Francken the second, as before observed, always clung to small surfaces; and though he gained some of the freedom of the moderns, he lost but little of the dryness or gaudiness of the earlier Italo-Flemish revivalists. F. Francken the third, the last of his name who deserves to be recorded, passed in the Antwerp guild in 1639, and died at Antwerp in 1667. His practice was chiefly confined to adding figures to the architectural or landscape pieces of other artists. As Franz Pourbus sometimes put in the portrait figures for Franz Francken the second, so Franz Francken the third often introduced the necessary personages into the works of Pieter Neefs the younger (museums of St. Petersburg, Dresden, and the Hague). In a Moses striking the Rock, dated 1654, of the Augsburg Gallery, this last of the Franckens signs D. õ (Den ouden) F. Franck. In the pictures of this artist we most clearly discern the effects of Rubens's example.

FRANÇOIS DE NEUFCHATEÂU, Nicolas Louis, Count (1750–1828), a French statesman and poet, was born at Saffais, in the district of Meurthe, 17th April, 1750. He studied at the college of Neufchâteau in the Vosges, and at the age of fourteen published a volume of poetry which obtained the approbation of Rousseau, and secured for its author so much *éclat* that Neufchâteau conferred on him its name, and he was elected member of some of the principal academies of France. In 1783 he was named procureur-general to the council of St. Domingo. He had previously been engaged on a translation of Ariosto, which he finished before his return to France five years afterwards, but it perished during the shipwreck which occurred during his voyage home. After the Revolution he was elected deputy to the National Assembly, of which he first became secretary and then president. In 1793 he was imprisoned on account of the political sentiments of his drama *Pamela*, but a few days afterwards the Revolution of the 9th of August restored to him his freedom. In 1798 he became minister of the interior, in which office he distinguished himself by the thoroughness of his administration in all departments. It is to him that France owes its system of inland navigation. From 1804 to 1806 he was president of the senate, and in that capacity the duty devolved upon him of soliciting Napoleon to assume the title of emperor. In 1808 he received the dignity of count. Retiring from public life in 1814, he occupied himself chiefly in the study of agriculture, until his death, 10th January, 1828. François de Neufchâteau had very multifarious accomplishments, and interested himself in a great variety of subjects, but his fame rests chiefly on what he did as a statesman for the encouragement and development of the industries of France. His maturer poetical productions did not fulfil the promise of those of his early years, for though some of his verses have a superficial elegance, his poetry generally lacks force and originality. He had considerable qualifications as a grammarian and critic, as is witnessed by his editions of the *Provinciales* and *Pensées* of Pascal, Paris, 1822 and 1826, and *Gil Blas*, Paris, 1820. His principal poetical works are *Poésies Diverses*, 1765; *Ode sur les Parlements*, 1771; *Nouveaux Contes Moraux*, 1781; *Les Vosges*, 1796; *Fables et Contes*, 1814; and *Les Tropes, ou les Figures de Mots*, 1817. He is also the author of a large number of works on agriculture.

See H. Bonnelier, *Mémoires sur François de Neufchâteau*, Paris, 1829; and J. Lamouroux, *Notice historique et littéraire sur la vie et les écrits de François de Neufchâteau*, Paris, 1843.

FRANCONIA, in German Franken, a name of very different application in different historical periods. It properly signifies the land of the Franks, and is consequently identical in original meaning with the word Francia or France. In the beginning of the 4th century the Frankish territory stretched from the Loire eastward to the basin of the Rhine and the Main; but it was shortly afterwards broken up into two divisions—Austrasia, Francia Orientalis, or the kingdom of the East Franks, and Neustria, Francia Occidentalis, or the kingdom of the West Franks. As time went on both kingdoms extended their boundaries; and when the treaty of Verdun in 845 settled the claims of the grandsons of Charles the Great, there was a kingdom of Western France with Latin tendencies, and a kingdom of Eastern France with Teutonic tendencies, each possessing a central district or duchy of its own name. These districts were separated from each other by the district of Lotharingia or Lorraine. The western was soon after lost sight of; but the eastern continued for a long period to be considered the very core and kernel of the German kingdom, and a theory became prevalent that it was the original seat of the Franks in Germany. Under the Saxon and Franconian emperors it was subdivided into Ost-Franken, Francia Orientalis, or Eastern Franconia *par excellence*, and Rhein-Franken, Francia Rhenensis, or Rhenish Franconia. The former, which was also distinguished as Saal-Franken, stretched from the Fichtelgebirge and the Rhone to the Danube, and from the Upper Palatinate to the Spessart and the lands of the Neckar; while the latter was the country between the Spessart and the Rhine, and included the present district of Frankfort-on-the-Main. Though the name frequently occurs in our histories, there was probably no proper "duchy" of Franconia, in the same sense at least as there was a duchy of Saxony or a duchy of Bavaria. Conrad I. and Conrad II., for example, do not style themselves dukes "of" Franconia but dukes "in" Franconia. Both Eastern Franconia and Rhenish Franconia were broken up into a number of distinct territories—countships, lordships, etc. When Maximilian divided Germany into circles in 1501, he gave the name of Franconia to the circle which included the bishoprics of Würzburg, Bamberg, and Eichstädt, the district of Mergentheim belonging to the grand master of the Teutonic Order, the territory of the abbey of Schönthal, the principalities of Baireuth and Ausbach, the countships of Henneberg and Schwarzenberg, the territories of the curia of Franconian counts, the imperial towns of Nuremberg, Rothenburg, Schweinfurt, Weissenburg, and Windsheim. Altogether the circle comprised 69 territories and had an area of about 10,430 square miles, and in 1792 its population amounted to 1,547,000. The name of Franconia ceased to be officially used after the dissolution of the German empire in 1806; but in 1837 King Louis I. of Bavaria gave the names of Upper, Middle, and Lower Franconia to what had previously been known as the circles of the Upper Main, the Rezat, and the Lower Main. Upper Franconia forms the north-east portion of Bavaria, and is partly conterminous with the frontiers of Bohemia, Saxony, and Prussia. Its mountains are the Fichtelgebirge, the Frankenwald, the Böhmerwald, and the Steigerwald; and the Main, the Naab, the Saale, and the Eger take their rise within its territory. The seat of the administration is at Baireuth, and the court of appeal at Bamberg. Lower Franconia lies to the west, and forms the north-west province of the kingdom,—conterminous with Prussia, Weimar, Meiningen, Würtemberg, Baden, and Hesse. Its rivers are the Main, the Saale, the Itz, and the Baunach. The principal town is Würzburg. Middle Franconia lies to the south of the other two, conterminous with the Upper Palatinate, Swabia, and Würtemberg. It is watered by the Regnitz and the Altmühl. The principal town is Nuremberg, the seat of the administration is at Ausbach, and the court of appeal at Eichstädt.

FRANEKER, a town of Holland, province of Friesland, is situated 10 miles W. of Leeuwarden, on the canal between that town and Haarlingen. The university founded here in 1585 was abolished by Napoleon I., and its endowments were diverted in 1815 to the support of an athenæum, and later of a gymnasium, with which a physiological cabinet and a botanical garden are connected. Franeker also possesses a very fine observatory. The university buildings are occupied by an asylum for insane. The chief industries of the town are silk-weaving, woollen spinning, and shipbuilding. Population in 1876, 6643.

FRANKENBERG, an important manufacturing town of Saxony, circle of Zwickau, is situated on the Zschopau, 7 miles N.E. of Chemnitz. The principal buildings are the great church, restored in 1874–5, and the new town-house. Frankenberg has extensive woollen, cotton, and silk manufactures, and also dye-works and cigar factories. Its educational establishments include a city school, a real school, and a technical school for engineering, in connection with which there is a chemical laboratory. Population in 1875, 10,462.

FRANKENHAUSEN, a town of Germany, principality of Schwartzburg-Rudolstadt, is situated on the Little Wipper, 36 miles N.N.E. of Gotha. It consists of an old and a new town, the latter mostly rebuilt since a very destructive fire in 1833, and has an old castle, two churches, a seminary for teachers, a hospital, and a new town-house. Its industries include the manufacture of sugar, cigars, and buttons, and there is a salt mine in the vicinity. At Frankenhausen a battle was fought 15th May, 1525, in which the peasants under Thomas Münzer were defeated by the Saxon, Brunswick, and Hessian troops. Population in 1875, 4725.

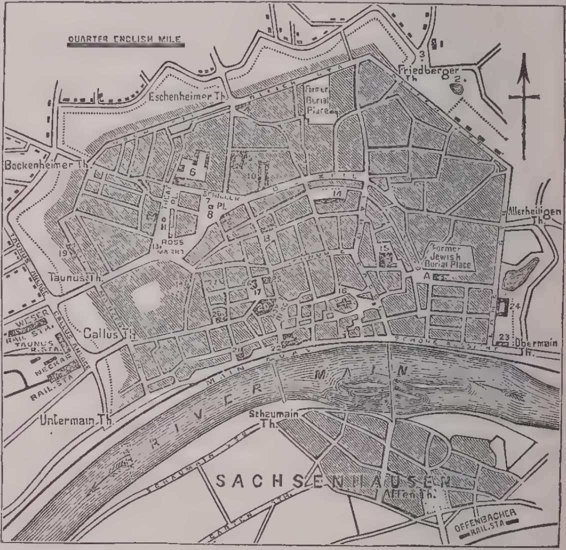
FRANKENSTEIN, a town in the Prussian province of Silesia, government of Breslau, is situated 35 miles S. by W. of the town of that name. It has a monastery of the charity friars, a garrison, and an old castle. The principal manufactures are linen, woollen, and cotton goods, straw hats, chemical substances, and salt. Population in 1875, 7492.

FRANKENTHAL, a town in the Rhenish district of Bavaria, is situated on the Isenach, 9 miles N.W. of Mannheim, and is connected with the Rhine by a canal 4 miles in length. It has a poorhouse, an infirmary, a deaf and dumb institution, an asylum for insane, and the ruins of an old monastery. Its principal industries are the manufacture of machinery, bell-founding, and brewing.

Frankenthal existed as a village in the 8th century, but it owes its prosperity to a colony of Flemish Protestant refugees who settled there in 1562. After this it rose very rapidly, so that in 1577 it became a town. The Spaniards made an unsuccessful attempt to capture it in 1621, and it was taken by them in 1623. In 1689 it was burned to the ground by the French, and it delivered itself up to the same power in 1796. Population in 1875, 7907.

FRANKFORT, a city of the United States, capital of Franklin county and of the State of Kentucky, is picturesquely situated on both sides of the Kentucky river, on a space of elevated ground bounded by a bluff 150 feet high. It is distant 29 miles W.N.W. from Lexington, and 65 miles E. from Louisville, by rail. The river is crossed at Frankfort by two bridges, and that portion of the town lying on the south side of the river is known as South Frankfort. The principal buildings are the State house, a marble building with a handsome portico supported by Ionic columns, the institution for imbecile children, the State penitentiary, the county court-house, and the public hall. The beautiful cemetery contains the remains of Daniel Boone, the pioneer of Kentucky, who died September 20, 1820. Frankfort has distilleries and flour and cotton mills, and a considerable trade in lumber. The river is navigable for steamers 40 miles above the city. Frankfort was laid out in 1787, and became the capital of the State in 1792. In 1862 it was occupied for a short time by the Confederates. The population in 1860 was 3702, and in 1870, 5396, of whom 2335 were colored.

FRANKFORT-ON-THE-MAIN, in German FRANKFURT or FRANKFURTH-AM-MAIN, one of the principal cities of the German empire, in the circle of Wiesbaden, in the Prussian province of Hesse-Nassau, and till 1866 one of the four free cities of Germany. It lies about 330 feet above the level of the sea, in 50° 6′ 43″ N. lat. and 8° 41′ 9″ E. long., 22 miles E. of Mainz and 16 miles N. of Darmstadt. The position which it occupies is one of no small natural beauty in the broad and fertile valley of the Main, its northern horizon being formed by the soft outlines of the Taunus range. The surrounding country is richly clad with orchard and forest, and in the season of spring especially presents a prospect of indescribable luxuriance. In earlier times the city with its fortifications had the form of an irregular pentagon, of which the longest side was defined by the right bank of the river; but now that the fortifications have been demolished, new suburbs have spread out widely in all directions, and the village of Sachsenhausen on the opposite side of the stream has extended in a similar fashion, so that the whole area of architectural occupation measures about 2½ miles from E. to W., and about 2 miles from N. to S. Even within the old encincture great transformations have been effected, and much of the quaint domestic architecture and the intricate network of narrow streets and lanes has given way to modern improvements. Only one side, for example, of the famous Judengasse or Jews' Street is now standing, the other having been demolished since 1870; but the visitor can still see the house were Ludwig Börne was born in 1786, and the dingy and unpretentious premises of No. 148 which saw the rise of the Rothschild family. When the whole of what remains of this street has been pulled down and rebuilt, as it must be ere long, there



Plan of Frankfort-on-the-Main.

1: Bethmann's Museum.
2. Bethmann's Monument.
3. Hessian Monument.
4. Senckenberg Museum.
5. Taxis Palace.
6. Barracks.
7. Schiller's Monument.
8. Hauptwache.
9. St. Catherine's Church.
10. Post-Office.
11. Goethe's Monumentand Platz.
12. French Reformed Church.
13. Gutenberg's Museum.
14, 15. Barracks.
16. Cathedral and Dom Platz.
17. St. Paul's Church and Platz.
18. Goethe's House.
19. Städel Institute.
20. Römer or Townhouse.
21. St. Leonard's Church.
22. Saalhof (Picture Gallery).
23. Library.
24. Strangers' Hospital.
25. Exchange.
26. Bank.
27. German Reformed Church.
A. Jews' Market and Infirmary.
B. Liebfrauenberg and Cathedral.

will still be many less celebrated parts of the old city of no small interest as eloquent relics of bygone conditions of life. In the modern quarters Frankfort will compare favorably, both in the general appearance of the streets and in the architectural character of individual buildings, with all except a very few of the greater cities of the Continent; and almost every year this is becoming more certainly true. Among the more spacious streets are the Schöne Aussicht or Beautiful Prospect along the Main, the Kaiser-Strasse or Emperor Street, and the Zeil. The business of the city is largely concentrated in the Zeil, the Rossmarkt or Horse Market, the Kaiser-Strasse, Friedens-Strasse, and their immediate vicinity.

The principal ecclesiastical building in Frankfort is the cathedral of St. Bartholomew's, which is situated not far from the river between the Domplatz on the N. and the Weekmarkt on the S. The date of its first foundation is not precisely known. A church called Salvator's was erected on the site by Louis the German at least as early as 874 A.D., and he enriched it with considerable donations, and instituted a chapter of twelve priests and an abbot. Charles the Fat not only confirmed his father's gifts in 882, but he added a *nona* or ninth of the produce of Frankfort, Trebur, Ingelheim, Kreiznach, and other royal domains. In the 12th century the church obtained possession of the skull of St. Bartholomew, and by the early part of the 13th it appears to have been known as St. Bartholomew's church. The building was by that time in a very dilapidated condition; and consequently Pope Gregory IX. urged the faithful of the diocese of Mainz to contribute to its restoration. When in 1315 the church was appropriated to the religious ceremonies connected with the coronation of the emperors, it was found necessary to enlarge its dimensions. The eastern portion, consisting of the choir and two towers, was pulled down and rebuilt on a larger scale about 1338, and in the same century the wings of the transepts and the imperial election chapel were added. The so-called *Pfarrthurm* or Parson's Tower was built between 1414 and 1512. In 1855 the interior was renovated; but on the night of the 14th August, 1867, the whole building was laid in ruins by a conflagration. In 1869 F. J. Denziger, chief architect of the Ratisbon (or Regensburg) cathedral was entrusted with the work of restoration, and his task has been steadily prosecuted. The only portions of the enterprise uncompleted in 1878 were the cloister and the grand organ. In the interior are still to be seen the high altar at which after 1562 the imperial coronations were celebrated, the tombstone of the emperor Günther of Schwarzburg, who died in Frankfort in 1349, and the tombstone of Rudolph, the last knight of Sachsenhausen, who died in 1371. The other Catholic churches are Leonhardskirche and Liebfrauenkirche, and the Deutschhauskirche in Sachsenhausen. St. Leonhard's ranks second to the cathedral in point of antiquity, and is said to occupy the site of the palace of Charles the Great. It possesses a stained glass window above the high altar, with a Lord's Supper by Hans Holbein. Our Lady's Church was founded in 1322 by Schöffen Weigel of Wambach, was made collegiate in 1326, and underwent a restoration in the second half of the 18th century. St. Paul's (Paulskirche), the principal church of the Evangelical Lutherans, was built between 1786 and 1833 on the site of the old church of the Minorites, and is mainly interesting as the seat of the national parliament of 1848–49. The church of St. Nicholas (Nicolaikirche) dates from the 13th century, and has a fine cast-iron spire erected in 1843. From 1570 to 1721, and again from 1813 to 1841, it was used as a warehouse. St. Catherine's was built about 1678–1680 on the site of an older building famous in Frankfort history as the place where the first Protestant sermon was preached in 1522. The principal synagogue—there are three altogether—is a Mauro-Byzantine structure erected between 1855 and 1860 in room of an older synagogue of the 15th century. Of the secular buildings in Frankfort perhaps the most characteristic is the Rathhaus or Römer, which by a strange coincidence bears a name suggestive of, though not derived from, its principal historical associations. It was here, in the Wahlzimmer or election room, that the electors or their plenipotentiaries decided the choice of the emperors, and here, in the Kaisersaal or emperor's hall, the coronation festival was held, at which the new recipient of the crown dined with the electors after having shown himself from the balcony to the people assembled in the Römerberg, as the open place in front of the building is called. The building dates from the 15th century, and occupies the site of the Golden Swan and two private houses which from time immemorial had borne the name of the Römer. The Kaisersaal retained its antique appearance till 1843; but it is now ornamented with a series of modern paintings by Veit, Jung, Ballenberger, and a score of other German artists representing the "German" emperors from Charlemagne to Francis II., in all fifty-two. The palace of the prince of Thurn and Taxis is a large building in the old French style of considerable historical interest: from 1806 to 1810 it was the residence of the "prince-primate," or head of the confederation of the Rhine; after the battle of Leipsic it was occupied by Francis I. of Austria; and from 1816 to 1866 the parliament of the German confederation held its sessions within its walls. The Eschenheim Tower is a picturesque relic of the ancient fortifications dating from the middle of the 14th century.

Hardly any fact about Frankfort is more familiar to the reader of Goethe than that it has an old bridge over the Main, and that on the bridge there has been for centuries an iron crucifix surmounted by a somewhat insignificant figure of a cock, commemorating, according to tradition, the unfortunate fowl which first crossed the bridge, and thus fell a prey to the devil who, in hope of a nobler victim, had sold his assistance to the original architect. The first distinct mention of a bridge over the river occurs in 1222, and the present structure dates from the 14th century. As late, at least, as 1475 the central span was not arched over. There are now fourteen arches in all, the total length of the bridge being 869 feet. The cock and crucifix are mentioned as early as 1405, and antiquaries assert that it probably marks the spot where criminals in the olden time were flung into the river. About half a mile below the old bridge a new bridge, called the "Unter-Main Brücke," was constructed by P. Schmick, between 1872 and 1874; and about midway between the two lies the footbridge or "Steg," erected by the same engineer in 1868–69, and the first example of its kind in Germany. The "Ober-Main" or Upper-Main Bridge was opened to traffic in the spring of 1878. Several other bridges for railway purposes are projected.

Few cities of the same size as Frankfort are so richly furnished with literary, scientific, and artistic institutions, or possess so many handsome buildings appropriated to their service. The town theatre was built between 1780 and 1827 in a Dutch-French style, and was restored in 1855; and as it has proved too small for the wants of the people, a new opera house has been erected near the Bockenheim gate, after the plans of Professor Lucä of Berlin. There is a public picture gallery in the Saalhof, containing works by Hans Holbein, Grünewald, Vandyck, Teniers, Van der Neer, Hans von Culmbach, Lucas Cranach, Martin Schön, etc. The nucleus of the collection is of very ancient date; considerable additions were made in 1803 at the secularization of the monasteries; in 1839 Ernst Fr. K. Prehn's cabinet of more than 850 small oil-paintings was presented by his heirs, and 220 that had belonged to Johann G. Chr. Daems were added in 1856, in terms of his bequest. The Städel Art Institute (Städel'sche Kunst-Institut) takes its name from Johann Friedrich Städel, who not only left his collection of paintings, engravings, and other property to the town, but appropriated a million marks to the erection of an institute and college. Its picture gallery and cabinet of engravings are both extremely rich in works of German art: the latter in 1874 had 54,300 plates. In the town library, which is kept in a building erected between 1820 and 1825, there are upwards of 100,000 volumes; and among its rarer treasures are a Gutenberg Bible, printed at Mainz between 1450 and 1455, another on parchment dated 1462, the *Institutiones Justiniani*, Mainz, 1468, the *Theuer-Dank*, with woodcuts by Hans Scheufelein, Abyssinian manuscripts presented by the African traveller Rüppel, and autographs of Luther, Melanchthon, Wallenstein, Napoleon I., Goethe, Schiller, etc. The Bethmann Museum owes its celebrity principally to Dannecker's Ariadne, but it also possesses the original plaster model of Thorwaldsen's Entrance of Alexander the Great into Babylon. Among the scientific institutions perhaps the chief place belongs to those named after J. Chr. Senckenberg, the physician. Senckenberg himself founded both the Bürger or citizens' hospital and the medical institute, with an anatomical theatre, botanical garden, and library; and a society of natural science (*Senckenbergsche*

Naturforschende Gesellschaft) was instituted in his honor in 1817, and now possesses an extensive and valuable museum. Large gardens were opened for the patients of the citizens' hospital in 1851, and in 1875 new buildings were added. A physical association was founded in 1824, an association for geography and statistics in 1836, a medical association in 1845, the association for history and archæology in 1857, and the free German institute for science, art, and general culture in 1859. An association for the cultivation of classical and especially of church music (the Cäcilien-Verein) was instituted by Schelble in 1818, and a similar association (the Rühl'sche Verein) by Rühl in 1851; and there are several other musical unions, such as the Philharmonische Verein, the Liederkranz, etc. In 1858 a zoological garden was opened by a joint-stock company near the Bockenheim Road; and in 1873 it was transferred to a new site on the Pfingstweide or Pentecost Meadow, and assigned to a new company. When in 1868 the duke of Nassau offered the plants of his winter garden for sale, a company, the Palm Garden Company, was formed at Frankfort, which purchased the collection, and established what is now the most beautiful of all the pleasure-grounds in the city.

Besides the Bürger Hospital already mentioned, Frankfort has several large institutions for the sick and infirm. The Holy Ghost Hospital, originally founded in 1278 for invalid pilgrims, is now appropriated to the servants and apprentices of Frankfort citizens. Its convalescent hospital, opened in 1868 at the Mainkur, was the first establishment of the kind in Germany. It maintains in each of the fourteen quarters of the town a physician, a surgeon, and an apothecary for the gratuitous assistance of the poor. The new asylum for the insane, with room for 200 patients, was erected between 1859 and 1863, partly by public subscription, and partly by a donation of 100,000 florins from Herr von Wiesenhütten. For its deaf and dumb institution the town is indebted to Ludwig Kosel, who in 1827 started with three pupils; and it was at his suggestion that the blind asylum was established by the society for the furtherance of the useful arts. The Waisenhaus or orphan asylum, erected in 1829, is no longer employed for its original purpose, as it has, since 1860, been thought better to board the orphan children with families in the neighboring villages of Lich, Wächtersbach, etc. It is sufficient to mention the Jewish infirmary, built at the expense of the Rothschilds; the new Jewish hospital, erected in 1874; Dr. Christ's children's hospital, originated in 1835; and the maternity hospital, opened in 1855. Among the numerous associations for benevolent purposes are the *Frauen-Verein*, or ladies' union, founded in 1813 for the assistance of sick families and women in childbed; the Jewish ladies' union for the education of orphan girls; the association originated in 1851 for taking charge of infants during the working hours; the Pestalozzi union (1846) for the education of neglected children, and its auxiliary, the Schuboth institute for Protestant boys (1865); the prison association, dating from 1868; and the Martha asylum, dating from 1866.

Frankfort has always been much more of a commercial than an industrial town, and at present it manufactures little else but Frankfort black, waxcloth, jewelry, gold and silver thread, tapestry, and such like articles. Bockenheim, however, a small town with which it is connected by tramway lines, is a flourishing manufacturing centre; and the Frankfort capitalists are connected with the industrial enterprises of Wiesbaden, Hanau, Offenbach, etc. There are two great fairs held in the town—the Ostermesse or spring fair, and the Herbstmesse or autumn fair. The former, which was the original nucleus of all the commercial prosperity of the city, begins on the second Wednesday before Easter; and the latter on the second Wednesday before the 8th of September. They last three weeks, and the last day save one, called the *Nickelchestag*, is distinguished by the influx of people from the neighboring country. The trade in leather is of great and growing importance. A horse fair has been held twice a year since 1862 under the patronage of the agricultural society; and the wool market was reinstituted in 1872 by the German Trade Society. Frankfort has long been famous as one of the principal banking centres of Europe; and throughout the city there are upwards of 220 banking offices. The so-called "Frankfort Bank" was founded in 1854, with a capital of 10,000,000 gulden. The exchange occupies a building opposite the Paulskirche, erected since 1840 according to the plans of Stüler of Berlin; and it is remarkable for the large business that is done in Government stock. In the 17th century the town was the seat of a great book-trade; but it has long been distanced in this department by Leipsic. The *Frankfurter Journal* was founded in 1615, the *Postzeitung* in 1616, the *Neue Frankfurter Zeitung* in 1859, and the *Frankfurter Presse* in 1866. The zoological garden company publish a monthly magazine devoted to the popularization of natural history; and the Senckenberg society have issued *Transactions* since 1854–55.

There are four railway stations in Frankfort: by the Weser station the traveller leaves for Nauheim and Cassel, for Homburg, for Kronberg, and the north generally; from the Taunus station he proceeds along the right bank of the river to Mainz; from the Neckar station he leaves for Darmstadt and the south, and for Mainz by the line along the left bank of the river; and from the Hanau station he proceeds eastwards. In Sachsenhausen there is the Offenbach-Hanau station. The Neckar railway crosses the river by a bridge erected in 1846–48, which is also used by the Offenbach and the "Linksmainisch" lines. Several other bridges across the river are projected in connection with the scheme for centralizing the railway systems. Communication within the town is facilitated by tramways; and there is also a line all the way to Bockenheim.

Frankfort has been the birthplace of not a few of the most celebrated men of Germany. J. G. Schlosser the historian, Feuerbach the philosopher, Kirchner the scholar and naturalist, Clement Brentano, Bettina von Arnim, and Ludwig Börne, are all in the list; but what the city considers its highest literary distinction is the fact that Johann Wolfgang Goethe was born in 1749 at No. 23 Hirschgraben. In 1863 the house was purchased for 56,000 florins by the Free German "Hochstift" (or Grand Association) for the sciences, arts, and general culture, and thus made for ever the common property of the German people. The society consists of members in all parts of the world, associated by admiration of the poet. Under the direction of Otto Volga the house has been as much as possible put into the state in which it was in Goethe's youth; and at the same time the rooms are turned into so many little museums of Goethe literature and art. On the high grounds to the south of the river there is a spot, now known as the Gothe Ruhe, or Goethe's Rest, where the poet is said to have admired the prospect of his native town, and there a tasteful wooden tower in the Swiss châlet style was built in 1877 by the Verschönerungs-Verein, or association for the beautifying of the city. The Goethe statue was erected in 1844 in what is now the Goethe Platz to the north of the Rossmarkt; it was designed by Schwanthaler, and cast in the royal foundry at Munich.

Of memorial monuments the largest and most elaborate in Frankfort is that erected in 1858 in honor of the early German printers. It was modelled by Ed. von der Lausitz and executed by Herr von Kreis. The statues of Gutenberg, Fust, and Schöffer form a group on the top; an ornamented frieze presents medallions of a number of famous printers; below these are figures representing the towns of Mainz, Strasburg, Venice, and Frankfort; and on the corners of the pedestal are allegorical statues of theology, poetry, science, and industry. The Schiller statue, erected in 1863, is the work of a Frankfort artist, Dielmann. A monument in the Bockenheim Anlege, dated 1837, preserves the memory of Guiollet, the burgomaster, to whom the town is mainly indebted for the beautiful promenades which occupy the site of the old fortification; and similar monuments have been reared to Senckenberg (1863), Bethmann, and Wiesenhütten. A statue of Charlemagne adorns the old Main bridge.

The new cemetery (opened in 1828) contains the graves of Arthur Schopenhauer and Feuerbach, of Passavant the biographer of Raphael, Ballenberger the artist, Hessemer the architect, Sömmerring the naturalist, Dr. Böhmer, and Städel. The Bethmann vault attracts attention by three bas-reliefs from the chisel of Thorwaldsen; and the Reichenbach mausoleum is a vast pile designed by Hessemer at the command of William II. of Hesse, and adorned with sculptures by Zwerger and Von der Lausitz. In the Jewish section, which is walled off from the rest of the burying-ground, the most remarkable tombs are those of the Rothschild family.

The present municipal constitution of the town dates from

1867, and conforms to the Prussian system. The electors choose 54 representatives for a term of 6 years; and every two years a third of the number retire, but are eligible for re-election. The 54 representatives elect twelve town councillors, six of whom receive a salary and serve for 12 years, while the rest receive no salary and serve for 6 years. The chief burgomaster is nominated by the king for 12 years, and the second burgomaster must receive the king's recognition. Since 1873 the town has been supplied with water from the Vogelsberg and the Spessart by the Frankfurter Quellwasserleitung Gesellschaft at the rate of about a million cubic feet per day, the natural pressure being sufficient to carry the water to the highest stories. The population of Frankfort has continued almost steadily to increase since the beginning of the century, the yearly percentage varying from 0·1 in 1843 to 8·9 in 1872. In 1817 the civil population was 41,458; in 1840, 55,269; in 1849, 58,599; in 1855, 63,495; and in 1864, 77,372. The events of 1866 led to a decline, and in 1867 the number was only 75,918. By 1871 it had again risen to 89,265; in 1872 it was 97,230; in 1873, 102,680; and in 1875, 103,136. Including the suburban villages (Bornheim 10,085, Bockenheim 13,043, Oberrad 4609, and Rödelheim 3903), the total is 134,776.

History.—Though the Romans certainly had settlements in the valley of the Main, as at Mattiacum (Wiesbaden) and Novus Vicus (Heddernheim), there is no proof that the site of Frankfort was permanently occupied before the arrival of the Franks, from whom it derives its name. Father Fuchs of Mainz, indeed, asserted in the end of the 18th century, that he had epigraphic evidence for the statement that Frankfort was founded by the Romans in the 2d century of the Christian era, and that by the 3d century it had become a great fortified city; but unfortunately none of the inscriptions to which he referred have ever been shown to exist. Popular tradition connects the origin of the town with the history of Charlemagne, asserting that the name Frankfort is due to the fact that once, when he was retreating from the Saxons, he and his Frankish army were safely conducted across the river by a doe, and that Sachsenhausen was so called because he settled there a colony of the Saxons whom he had subdued. The first truly historical notice of the town occurs in 793, when Eginhard, Charlemagne's biographer, tells us that he spent the winter in the villa Frankonovurd. Next year there is mention more than once of a royal palace there, and the early importance of the place is indicated by the fact that it was chosen as the seat of an ecclesiastical council, which was attended not only by German but by French and Italian bishops, as well as by two papal legates. The name Frankfort is also found in several official documents of Charlemagne's reign; and from the notices that occur in the early chronicles and charters it would appear that the place was the most populous at least of the numerous villages of the Main district. During the Carlovingian period it was the seat of no fewer than 16 imperial councils or colloquies. The town was probably at first built on an island in the river. It was originally governed by a royal officer or *actor dominicus*, and down even to the close of the empire it remained a purely imperial or royal town. It gradually acquired various privileges, and by the close of the 14th century the only mark of dependence was the payment of a yearly tax. Louis the Pious dwelt even more frequently at Frankfort than his father had done, and about 823 he built himself a new palace, the basis of the later Saalhof. In 822 and 823 two great diets were held in the palace, and at the former there were present deputies from the eastern Slavs, the Avars, and the Normans. The place continued to be a favorite residence with Louis the German, and he died there in 876. By the rest of the Carlovingian kings it was less frequently visited, and this neglect was naturally greater during the period of the Saxon and Salic emperors from 908 to 1137. Diets, however, were held in the town in 951, 1015, 1069, and 1109, and councils in 1000 and 1006. From a privilege of Henry IV., in 1074, granting the city of Worms freedom from tax in their trade with several royal cities, it appears that Frankfort was even then a place of some commercial importance. In 1217 we find mention made of an imperial mint and a corn market in the town. About 1227 it was already in possession of a yearly fair. Between 1140 and the beginning of the interregnum it saw 21 diets, and that of 1142 gave rise to the Guelph and Ghibelline parties. No fewer than 10 new churches were erected in the 50 years from 1220 to 1270. It was about the same period, probably in 1240, that the Jews first settled in the town. In the contest which Louis the Bavarian maintained with the papal throne Frankfort sided with the emperor, and it was consequently placed under an interdict for 20 years from 1329 to 1349. On Louis's death it refused to accept the papal conditions of pardon, and only yielded to Charles IV., the papal elect, when Günther of Schwarzburg thought it more prudent to abdicate in his favor. Charles granted the city a full amnesty, and confirmed its liberties and privileges. By the famous bull of 1356, called by way of distinction the Golden Bull, or, after the emperor, *Bulla Carolina*, Frankfort is declared the seat of the imperial elections (Wahlstadt Reiches), and it still preserves an official contemporaneous copy of the original document as the most precious of the eight imperial bulls in its possession. In the 17th and 18th centuries, says Kriegk, the bull was regarded as the most notable sight of the city, and was only exhibited to persons of high rank. From the date of the bull to the close of the empire, Frankfort retained the position of "Wahlstadt," and only five of the two-and-twenty monarchs who ruled during that period were elected elsewhere. In 1388–89 Frankfort assisted the South-German towns in their wars with the princes and nobles, and in a consequent battle with the troops of the Palatinate, the town banner was lost and carried to Kronberg, where it was long preserved as a trophy. On peace being concluded in 1391, the town had to pay 12,562 florins, and this brought it into great financial difficulties. In the course of the next 50 years debt was contracted to the amount of 126,772 florins. The diet at Worms in 1495 chose Frankfort as the seat of the newly instituted Imperial Chamber, or "*Reichs-Kammergericht*," for the settlement of discussions between the different states of the empire; and it was not till 1527 that the chamber was removed to Spires. At the Reformation Frankfort heartily joined the Protestant party, and in consequence it was hardly treated both by the emperor Charles V. and by the archbishop of Mainz. It refused to subscribe the Augsburg Recess, but at the same time it was not till 1536 that it was prevailed to join the Smalkaldic League. On the failure of this confederation it opened its gates of its own accord to the imperial general Büren on 29th Dec., 1546, although he had passed by the city, which he considered too strong for the forces under his command. The emperor was merciful enough to leave it in possession of its privileges, but he inflicted a fine of 80,000 gold gulden, and the citizens had to endure till Oct., 1547, the presence of from 8000 to 10,000 soldiers. This resulted in a pestilence which not only lessened the population but threatened to give the death-blow to the great annual fairs; and at the close of the war it was found that it had cost the city no less than 228,931 gulden. In 1522 Frankfort was invested for three weeks by Maurice of Saxony, who was still in arms against the emperor, but it continued to hold out till peace was concluded between the principal combatants. Between 1612 and 1616 occurred the great Fettmilch insurrection, perhaps the most remarkable episode in the internal history of Frankfort. The magistracy had been acquiring more and more the character of an oligarchy; all power was practically in the hands of a few closely-related families; and the gravest peculation and malversation took place without hindrance. The ordinary citizens were roused to assert their rights, and they found leaders in Fettmilch, Gerngross, and Schopp, who carried the contest to dangerous excesses, but lacked ability to bring it to a successful issue. An imperial commission was ultimately appointed, and the three principal culprits and several of their associates were executed in 1616, with the barbarous devices of the times. It was not until 1801 that the last mouldering head of the Fettmilch company dropped unnoticed from that old tower which, from its position near the bridge, is known as the Brückenthurm. In the words of Dr. Kriegk, who has furnished a detailed history of the whole period, the insurrection completely destroyed the political power of the guilds, gave new strength to the supremacy of the patriciate, and brought no further advantage to the rest of the citizens than a few improvements in the organization and administration of the magistracy. The Jews, who had been attacked by the popular party, were solemnly reinstated by imperial command in all their previous privileges, and received full compensation for their losses. During the Thirty Years' War Frankfort did not escape. In 1631 Gustavus Adolphus garrisoned it with 600 men, who remained in possession till they were expelled four years later by the imperial general Lamboy. In 1792 the citizens had to pay 2,000,000 gulden to the French general Custine; and in 1796 Kléber bombarded the town, and exacted 8,000,000 francs. The independence of Frankfort was brought to an end in 1806, on the formation of the Confederation of the Rhine; and in 1810 it was made the capital of a grand-duchy of Frankfort, which had an area of 3215 square miles, with 302,100 inhabitants, and was divided into the four districts of Frankfort, Aschaffenburg, Fulda, and Hanau. On the reconstitution of Germany in 1815 it again became a free city, and in the following year it was declared the seat of the German Confederation. In April, 1833, occurred what is known as the Frankfort Riot (Frankfurter Attentat), in which a number of German students, assisted by the peasants of the vicinity, attempted to break up the diet. The city joined the German Zollverein in 1836. During the revolutionary period of 1848 the people of Frankfort took a chief part in political movements, and the streets of the town were more than once the scene of conflict. In the war of 1866 they were on the Austrian side. On the 16th of July the Prussian troops, under General Vogel von Falkenstein, entered the town, and on the 8th of October it was formally incorporated with the Prussian state. A fine of 6,000,000 florins was exacted. In 1871 the treaty which concluded the Franco-German war was signed in the Swan Hotel by Prince Bismarck and Jules Favre, and it is consequently known as the Frankfort Peace.

See Böhmer, *Urkundenbuch der Reichsstadt Frankfurt*, 1836; Kirchner, *Geschichte der Stadt Frankfurt*, 1807–1810; Feyerlein, *Nachträge, etc., zur Geschichte Frankfurts*, 1819; *Tableau historique et topographique de Francfort*, Frankfort, 1828; *Mittheilungen über Physisch-geographische . . . Verhältnisse von Frankfurt am Main*, 1839–41; Krug, *Historisch-topogr. Beschreibung von Frankfurt*, 1845; Meidinger, *Statistische Uebersicht*, 1841, and *Zur Statistik Frankfurts*, 1848; Battoun, *Oertliche Beschreibung der Stadt Frankfurt*, 1861, and *Kaiserdom zu Frankfurt*, 1869; Kreigk, *Geschichte von Frankfurt*, 1871; *Archiv. für Frankfurts. Geschichte und Kunst*, 1839–1874; Stricker, *Neuere Geschichte von Frankfurt*, 1874–75; the *Mittheilungen* of the Society in Frankfort for History and Archæology; Ravenstein's *Führer durch Frankfurt a. M. und Ungebungen* (no date). In 1864 Fr. W. Delkeskamp published a beautiful *Malerischer Plan von Frankfurt a. M. und seiner nächsten Umgebung; nach der Natur aufgenommen und auf geometrischer Basis in Vogelschau gezeichnet.* (H. A. W.)

FRANKFORT-ON-THE-ODER, in German *Frankfurt-an-der-Oder*, a town of Germany at the head of a government in the Prussian province of Brandenburg, about 50 miles in an easterly direction from Berlin. The town proper, which has far outgrown the limits of its ancient walls, lies on the left of the river, but it is connected by a wooden bridge 900 feet long with the suburb of Damm. Among the more important buildings are the Protestant church of St. Mary's (the Oberkirche), a handsome brick edifice of the 13th century, the Roman Catholic church, the Jewish synagogue, the Rathhaus, dating from 1607, and bearing on its southern gable the sign of the Hanseatic League, the city infirmary, three hospitals, an orphan asylum, a workhouse, a theatre, the Frederick gymnasium, and the provincial industrial school. The university of Frankfort, which was founded in 1506 by the elector of Brandenburg, Joachim I., was removed to Breslau in 1811, and the university buildings are now occupied by the Realschule. As the chief town of a province, Frankfort is the seat of a court of appeal, a general commission, and a number of administrative boards. Its industry is mainly devoted to the manufacture of iron-wares, pottery, paper, silk and woollen goods, bone-dust, chocolate, and liqueurs. Being situated on the high road from Berlin to Silesia, commanding an extensive system of water communication by means of the Oder and its canals to the Vistula and the Elbe, and in modern times having become an important railway junction, it maintains no small commercial activity, which is further fostered and concentrated by its three annual fairs held respectively at *Reminiscere* or the second Sunday in Lent, at St. Margaret's day, and at Martinmas. The population, which in 1849 was 29,969, had at the census of 1875 attained to 47,176. The municipal existence of Frankfort goes back to 1253, when it was colonized by Frankish merchants introduced by John and Conrad of Brandenburg, who had recently conquered the district from the Wends. The principal facts in its external history are—the siege which it successfully sustained against the emperor Charles IV. in the time of the pretender Waldemar; the papal excommunication in 1426, on account of its quarrel with the bishop of Lebus; the siege of the Hussites in 1432, of the Poles in 1450, and of the duke of Sagan in 1477; and its capture by Gustavus Adolphus in 1631, and by the Russians in 1759. The presence of the Russians on this occasion cost the town 300,000 thalers, and in the earlier part of the following century the continual quartering of foreign troops created great destitution, compelling the magistrates to procure a loan of 208,000 thalers. Ewald von Kleist died in the town in August, 1759, from the effects of a wound received in the battle at the neighboring village of Kunersdorf; a monument was erected over his grave in the "park" in 1779. Henrich von Kleist was born in the town in 1776, and Franz von Gaudy in 1800.

See K. R. Hausen, *Gesch. der Universitat und Stadt Frankfurth*, 1806, and the *Gesch. der Stadt Frankfurt*, of Sachse (1830), Spieker (1853), and Philippi (1865).

FRANKINCENSE,[1] or OLIBANUM[2] (Gr., *λιβανωτός*, later *θύος*; Lat., *tūs* or *thus*; Heb., *lebonah*;[3] Ar., *lubân*;[4] Turk., *ghyunluk*; Hind,, *ganda-birosa*[5]), a gum-resin obtained from certain species of trees of the genus *Boswellia*, and natural order *Burseracæ*. The members of the genus are possessed of the following characters:—Bark often papyraceous; leaves deciduous, compound, alternate, and imparipinnate, with leaflets serrate or entire; flowers in racemes or panicles, white, green, yellowish, or pink, having a small persistent, 5-dentate calyx, 5 petals, 10 stamens, a sessile 3 to 5-chambered ovary, a long style, and a 3-lobed stigma; fruit trigonal or pentagonal; and seed compressed. Dr. George Birdwood (*Trans. Lin. Soc.*, xxvii., 1871) distinguishes five species of Boswellia:—(A) *B. thurifera*, Colebr. (*B. glabra* and *B. serrata*, Roxb.), indigenous to the mountainous tracts of Central India and the Coromandel coast, and *B. papyrifera* (*Plösslea floribunda*, Endl.) of Abyssinia, which, though both thuriferous, are not known to yield any of the olibanum of commerce; and (B) *B. Frereana* (see ELEMI, vol. viii. p. 116), *B. Bhau-Dajiana*, and *B. Carterii*, the "Yêgaar," "Mohr Add," and "Mohr Madow" of the Somali country, in East Africa, the last species including a variety, the "Maghrayt d'Sheehaz" of Hadramaut, Arabia, all of which are sources of true frankincense, or olibanum. The trees on the coast of Adel are described by Captain G. B. Kempthorne as growing, without soil, out of polished marble rocks, to which they are attached by a thick oval mass of substance resembling a mixture of lime and mortar: the purer the marble the finer appears to be the growth of the tree. The young trees, he states, furnish the most valuable gum, the older yielding merely a clear glutinous fluid resembling copal varnish.[6] To obtain the frankincense a deep incision is made in the trunk of the tree, and below it a narrow strip of bark five inches in length is peeled off. When the milk-like juice ("spuma pinguis," Pliny) which exudes has hardened by exposure to the atmosphere, the incision is deepened. In about three months the resin has attained the required degree of consistency. The season for gathering lasts from May until the first rains in September. The large clear globules are scraped off into baskets, and the inferior quality that has run down the tree is collected separately. The coast of South Arabia is yearly visited by parties of Somalis, who pay the Arabs for the privilege of collecting frankincense.[7] In the interior of the country about the plain of Dhofár,[8] during the south-west monsoon, frankincense and other gums are gathered by the Beni Gurrah Bedouins, and might be obtained by them in much larger quantities; their lawlessness, however, and the lack of a safe place of exchange or sale are obstacles to the development of trade. (See C. Y. Ward, *The Gulf of 'Aden Pilot*, p. 117, 1863.) Much as formerly in the region of Sakhalites in Arabia (the tract between Ras Makalla and Ras Agab),[9] described by Arrian, so now on the sea-coast of the Somali country, the frankincense when collected is stored in heaps at various stations. Thence, packed in sheep and goat-skins, in quantities of 20 to 40 ℔, it is carried on camels to Berbera, for shipment either to Aden, Makalla, and other Arabian ports, or directly to Bombay.[10] At Bombay, like gum-acacia, it is assorted, and is then packed for re-exportation to Europe, China, and elsewhere.[11] Arrian relates that it was an import of Barbarike on the Sinthus (Indus). The idea held by several writers, including Niebuhr, that frankincense was a product of India, would seem to have originated in a confusion of that drug with benzoin and other odoriferous substances, and also in the sale of imported frankincense with the native products of India. The gum resin of *Boswellia thurifera* was described by Colebrooke (in *Asiatick Researches*, ix. 381, and after him by Dr. J. Fleming (*Ib.*, xi. 158), as true frankincense, or olibanum; from this, however, it differs in its softness, and tendency to melt into a mass[1] (Birdwood, *loc. cit.*, p. 146). It is sold in the village bazaars of Khandeish in India under the name of *Dup-Salai, i. e.*, incense of the "Salai tree;" and according to Mr. F. Porter Smith, M.B. (*Contrib. towards the Mat. Med. and Nat. Hist. of China*, p. 162, Shanghai, 1871), is used as incense in China. The last authority also mentions olibanum as a reputed natural product of China. Bernhard von Breydenbach,[2] Ausonius, Florus, and others, arguing, it would seem, from its Hebrew and Greek names, concluded that olibanum came from Mount Lebanon; and Chardin (*Voyage en Perse*, etc., 1711) makes the statement that the frankincense-tree grows in the mountains of Persia, particularly Caramania.

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[1] Stephen Skinner, M.D. (*Etymologicon Linguæ Anglicanæ*, Lond., 1671), gives the derivation: "Frankincense, Thus, *q. d.* Incensum (*i. e.*) Thus Libere seu Liberaliter, ut in sacris officiis par est, adolendum."

[2] "Sic *olibanum* dixere pro thure ex Græco ὁ *λίβανος*" (Salmasius, *C. S. Plinianæ Exercitationes*, t. ii. p. 926, b. F., Traj., ad Rhen., 1689, fol.). So also Fuchs (*Op. Didact.*, pars. ii. p. 42, 1604, fol.), "Officinis non sine risu eruditorum, Græco articulo adjecto, *Olibanus* vocatur." The term *olibano* was used in ecclesiastical Latin as early as the pontificate of Benedict IX., in the 11th century. (See Ferd. Ughellus, *Italia Sacra*, tom. i. 108, D., Ven., 1717, fol.)

[3] So designated from its whiteness (J. G. Stuckius, *Sacror. et Sacrific. Gent. Descrip.*, p. 79, Ludg. Bat., 1695, fol.; Kitto, *Cycl. Bibl. Lit.*, ii. p. 806, 1870): *cf. Laben*, the Somali name for cream (R. F. Burton, *First Footsteps in E. Africa*, p. 178, 1856).

[4] Written *Louan* by Garcias da Horta (*Aromat. et Simpl. Medicament. Hist., C. Clusii Atrebatis Exoticorum Lib. Sept.*, p. 157, 1605, fol.), and stated to have been derived by the Arabs from the Greek name, the term less commonly used by them being *Conder*: *cf.* Sanskrit *Kunda*. According to Colebrooke (in *Asiatick Res.*, ix. p. 379, 1807), the Hindu writers on Materia Medica use for the resin of *Boswellia thurifera* the designation *Cunduru*.

[5] A term applied also to the resinous exudation of *Pinus longifolia* (see Dr. E. J. Waring, *Pharmacopœia of India*, p. 52, Lond., 1868).

[6] See "Appendix," vol. i. p. 419 of Sir W. C. Harris's *Highlands of Æthiopia*, 2d ed., Lond., 1844; and *Trans. Bombay Geog. Soc.*, xiii., 1857, p. 136.

[7] Cruttenden, *Trans. Bombay Geog. Soc.*, vii., 1846, p. 121; S. B. Miles *J. Geog. Soc.*, 1872.

[8] Or Dhafár. The incense of "Dofar" is alluded to by Camoens, *Os Lusiadas*, x. 201.

[9] H. J. Carter, "Comparative Geog. of the South-East Coast of Arabia," in *J. Bombay Branch of R. Asiatic Soc.*, iii., Jan., 1851, p. 296; and Müller. *Geog. Græci Minores*, i. p. 278, Paris, 1855.

[10] J. Vaughan, *Pharm. Journ.*, xii., 1853, p p. 227–9; and Ward, *op. cit.* p. 97.

[11] Pereira, *Elem. of Mat. Med.*, ii. pt. 2, p. 380, 4th ed., 1847.

That frankincense, or olibanum, was in ancient times, as now, of West-Asiatic origin there is abundant evidence in the writings of classical authors. It was Sabæan incense that was burnt on the altar of Venus at Paphos (Virg., *Æn.*, i. 416; *cf. Georg.*, ii. 117), and Arabia and the land of Thus were synonymous (*cf.* Plautus, *Trinummus*, iv. 2. 89, and *Pœnulus*, v. 4. 6). Herodotus (iii. 107) and Pliny (*loc. cit.*) speak of Arabia as the only country that yields frankincense; Strabo (xvi. 4) and Arrian more correctly mention it as an export also of the neighboring African coast. According to Diodorus Siculus (v. 41), the "Holy Island," at the furthest point of Arabia Felix, the habitation of the Panchæans, was the source of frankincense.

In the Scriptures "incense," or frankincense, is noticed as forming part of the merchandise of the Sabæans (Heb. *Shebaiim*), who inhabited Sheba or Arabia Felix (*cf.* Is. xl. 6, Jer. vi. 20, and 1 Kings x. 10). Theophrastus (*Opera*, ix. 4., ed. F. Wimmer, p. 143) relates that with other spices it was produced by the regions of Arabia about Saba, Adramyta, Citibæna, and Mamali, and after transportation to the Sabæan temple of the Sun was purchased by merchants who came thither.

The libanotophorous region of the ancients is defined by Carter (*J. Bombay Br. R. Asiatic Soc.*, ii. p. 387, 1847) as extending between the Sabhan Mountains, in 17° 30′ N. lat. and 55° 23′ E. long., and the town of Damkote, in the bay of Alkammar, in 52° 47′ E. long. The trees there are congregated in two distinct localities—on the Nejdee or high land, two days' journey from the sea-shore, and on the Sahil or plain on the coast.[3] Its ancient evil reputation as a land of fogs and dark atmosphere, where slaves, as a punishment, collected the frankincense (Vincent's *Voyage of Nearchus*, etc., p. 89, Oxf., 1809), and where the trees that afforded that substance were infested with winged serpents of various colors, which could be driven away only by the smoke of storax (Herod. iii. 107), was not improbably due to the fertile imaginations of Arabian spice-monopolists. By their trade in frankincense and other aromatics the Sabæans and Gerrhæi, we are informed by Strabo, became the richest of all the Arabian tribes; and it was doubtless from their emporium at Petra that these, with other articles of commerce, were by caravan conveyed into Egypt and Canaan by the Edomites, Idumæans, or, as they came to be called, Nabatæans, and into the Mediterranean coast-regions by the Phœnician Arabs. (See Dr. G. Birdwood's *Handbook to the British Indian Section, Paris Universal Exhibition of 1878*, Lond. and Par., 1878, p. 32.) In what is believed to have been the early part of the 15th century B.C. (see EGYPT, vol. vii. p. 639), the ships of the Egyptian queen Hatasu, or Hatshepu, made an expedition to Pun or Punt (held by Professor Dümichen to be the countries on the Arabian coast of the Red Sea where the Phœnicians were established before they settled on the shores of the Mediterranean), and thence brought to Thebes, together with ivory, gold, silver, dog-faced baboons,[4] leopard-skins, and other of the "magnificent products of Pun," not only incense-resin, but 31 incense-trees, planted in tubs, from the "mountains of the barbarians."[5]

From the frequent employment of frankincense in the sacrifices of the ancients, shown by numerous passages in their prose and poetic writings, it is evident that the trade in that substance must formerly have been very extensive. A tribute of no less than a thousand talents' weight of it was brought to Darius every year by the Arabs, and the same quantity was yearly burnt by the Chaldæans on their great altar to Bel at Babylon (Herodotus, iii. 97, i. 183). From the spoils of Gaza, in Syria, 500 talents' weight of frankincense was sent by Alexander the Great to Leonidas (see Plutarch's *Lives*). It was in olden times accounted one of the most valuable of the products of the East. Ten talents' weight of it was one of the precious gifts sent by Seleucus II., king of Syria, and his brother Antiochus Hierax, king of Cilicia, to the temple of Apollo at Miletus, 243 B.C.;[6] and gold, frankincense, and myrrh were presented by the magi from the East to the infant Saviour (Matt. ii. 11).[7] Later, in the time of St. Silvester (314–335 A.D.), we find 100 pounds of "aromatum in incensum," or frankincense, mentioned among the costly offerings made by the emperor Constantine in the basilica of St. Marcellinus and St. Peter at Rome.[8]

Frankincense, or olibanum, occurs in commerce in semi-opaque, round, ovate, or oblong tears or irregular lumps, which are covered externally with a white dust, the result of their friction against one another. It has an amorphous internal structure, a dull fracture; is of a yellow to a yellowish-brown hue, the purer varieties being almost colorless, or possessing a greenish tinge; and has a somewhat bitter aromatic taste, and a balsamic odor, which is developed by heating. Immersed in alcohol it becomes opaque, and with water it yields an emulsion. It contains about 72 per cent. of resin soluble in alcohol (Kurbatow); a large proportion of gum soluble in water, and apparently identical with gum-arabic; and a small quantity of a colorless inflammable essential oil, one of the constituents of which is the body oliben, $C_{10}H_{16}$. Frankincense burns with a bright white flame, leaving an ash consisting mainly of calcium carbonate, the remainder being calcium phosphate, and the sulphate, chloride, and carbonate of potassium (Braconnot).[9] Good frankincense, Pliny tells us, is recognized by its whiteness, size, brittleness, and ready inflammability. That which occurs in globular drops is, he says, termed "male frankincense;" the most esteemed, he further remarks, is in breast-shaped drops, formed each by the union of two tears.[10] The best frankincense, as we learn from Arrian,[11] was formerly exported from the neighborhood of Cape Elephant in Africa (the modern Ras Fiel); and A. von Kremer, in his description of the commerce of the Red Sea (*Ægypten*, etc., p. 185, ii. Theil, Leipzig, 1863) observes that the African frankincense, called by the Arabs "asli," is of twice the value of the Arabian "luban." Captain S. B. Miles (*loc. cit.*, p. 64) states that the best kind of frankincense, known to the Somali as "bedwi" or "sheheri," comes from the trees "Mohr Add" and "Mohr Madow" (*vide supra*), and from a taller species of *Boswellia*, the "Boido," and is sent to Bombay for exportation to Europe; and that an inferior "mayeti," the produce of the "Yegaar," is exported chiefly to Jeddah and Yemen ports.[12]

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[1] "*Boswellia thurifera,*" . . . says Waring (*Pharm. of India*, p. 52), "has been thought to yield East Indian olibanum, but there is no reliable evidence of its so doing."

[2] "Libanus igitur est mons redolentie & summe aromaticitatis. nam ibi herbe odorifere crescunt. ibi etiam arbores thurifere coalescunt. quarum gummi electum olibanum a medicis nuncupatur."—*Perigrinatio*, p. 53, 1502, fol.

[3] *Cf.* Theophrastus (*op. cit.*, p. 144): *τὰ μέν ἐν τῷ ὄρει τὰ δ' ἐν ταῖς ἰδίαις γεωργίαις ὑπὸ τὴν ὑπώρειαν.*"

[4] *Cf.* King Solomon's imports in the ships of the Phœnician city of Tarsus or Tarshish (2 Chron. ix. 21).

[5] See Dr. J. Dümichen, *The Fleet of an Egyptian Queen*, etc., translated by Anna Dümichen, plates ii., iii., xv., xvii.–xix., Leipzig, 1868.

[6] E. Chishull, *Antiquitates Asiaticæ Christianam Æram Antecedentes*, pp. 65–72, Lond., 1728, fol.

[7] According to an old Persian legend, and other traditions, the gold signified the kingship, the frankincense the divinity, the myrrh the healing powers of the Child. See H. Yule, *The Book of Ser Marco Polo*, vol. i. pp. 73–78, 1871.

[8] Vignolius, *Liber Pontificalis*, t. i. p. 101, Romæ, 1724, 4to.

[9] See, on the chemistry of frankincense, Braconnot, *Ann. de Chimie*, lxviii., 1808, pp. 60–69; Johnston, *Phil. Trans.*, 1839, pp. 301–305; J. Stenhouse, *Ann. der Chem. und Pharm.*, xxxv., 1840, p. 306; and A. Kurbatow, *Zeitsch. für Chem.*, 1871, p. 201.

[10] "Præcipua autem gratia est mammoso, cum hærente lacryma priore consecuta alia miscuit se" (*Nat. Hist.*, xii. 32). One of the Chinese names for frankincense, *Ju'-hiang*, "milk-perfume," is explained by the *Pen Ts'au* (xxxiv. 45), a Chinese work, as being derived from the nipple-like form of its drops. (See E. Bretschneider, *On the Knowledge possessed by the Ancient Chinese of the Arabs*, etc., p. 19, Lond., 1871.)

[11] *The Voyage of Nearchus, loc. cit.*

[12] Vaughan (*Pharm. Journ.*, xii., 1853) speaks of the Arabian Lubân, commonly called *Morbat* or *Shaharree Luban*, as realizing higher prices in the market than any of the qualities exported from Africa. The incense of "Esher," *i. e.*, Shihr or Shehr, is mentioned by Marco Polo, as also by Barbosa. (See Yule, *op. cit.*, ii., p. 377.) J. Raymond Wellsted (*Travels to the City of the Caliphs*, p. 173, Lond., 1840) distinguishes two kinds of frankincense—"*Meaty*," selling at $4 per cwt., and an inferior article fetching 20 per cent. less.

The latter may possibly be what Niebuhr alludes to as "Indian frankincense."[1] Garcias da Horta, in asserting the Arabian origin of the drug, remarks that the term "Indian" is often applied by the Arabs to a dark-colored variety.[2]

According to Pliny (*Nat. Hist.* xiv. 1; *cf.* Ovid, *Fast.* i. 337 *sq.*), frankincense was not sacrificially employed in Trojan times. It was used by the ancient Egyptians in their religious rites, but, as Herodotus tells us (ii. 86), not in embalming. It constituted a fourth part of the Jewish incense of the sanctuary (Ex. xxx. 34), and is frequently mentioned in the Pentateuch. With other spices it was stored in a great chamber of the house of God at Jerusalem (1 Chron. ix. 29, Neh. xiii. 5–9). On the sacrificial use and import of frankincense and similar substances see Incense.

In the Red Sea regions frankincense is valued not only for its sweet odor when burnt, but as a masticatory; and blazing lumps of it are not infrequently used for illumination instead of oil lamps. Its fumes are an excellent insectifuge. As a medicine it was in former times in high repute. Pliny (*Nat. Hist.*, xxv. 82) mentions it as an antidote to hemlock. Avicenna (ed. Plempii, lib. ii. p. 161, Lovanii, 1658, fol.) recommends it for tumors, ulcers of the head and ears, affections of the breast, vomiting, dysentery, and fevers. Dr. Delioux of Toulon (*Bull. Gén. de Thérap.*, Feb. 28, 1861) considers its curative properties equal to those of other balsamic medicines, and that for cheapness it is preferable for hospital use to the balsams of Peru and Tolu, and, being more agreeable to the stomach, to tar. As a fumigating agent, he advocates its employment in bronchitis and chronic laryngitis. In the East frankincense has been found efficacious as an external application in carbuncles, blind boils, and gangrenous sores, and as an internal agent is given in gonorrhœa. In China it was an old internal remedy for leprosy and struma, and is accredited with stimulant, tonic, sedative, astringent, and vulnerary properties. Its stimulant action appears to be directed chiefly to the mucous surfaces of the body. (See Waring, *Pharm. of India*, p. 443, etc.; and F. Porter Smith, *op. cit.*, p. 162.)

Common Frankincense or Thus, *Abietis resina*, is the term applied to a resin which exudes from fissures in the bark of the Norway spruce fir, *Abies excelsa*, D.C.; when melted in hot water and strained it constitutes "Burgundy pitch," *Pix abietina.* The concreted turpentine obtained in the United States by making incisions in the trunk of a species of pine, *Pinus australis*, is also so designated. It is commercially known as "scrape," and is similar to the French "galipot" or "barras." Common frankincense is an ingredient in some ointments and plasters, and on account of its pleasant odor when burned has been used in incense as a substitute for olibanum. (See Flückiger and Hanbury, *Pharmacographia.*) The "black frankincense oil" of the Turks is stated by Hanbury (*Science Papers*, p. 142, 1876) to be liquid storax. (F. H. B.)

FRANKLIN. See Freehold.

FRANKLIN, Benjamin (1706–1790), one of the most eminent journalists, diplomatists, statesmen, and philosophers of his time, was born in the city of Boston, and in the colony of Massachusetts Bay, on the 17th of January, 1706. He was the youngest of ten children, and the youngest son of the youngest son for five consecutive generations. His father, who was born at Ecton, in Northamptonshire, England, where the family may be traced back for some four centuries, married young, and emigrated to America with three children in 1682. From his parents, who never knew any illness save that of which they died (the father at eighty and the mother at eighty-five), he inherited an excellent constitution, and a good share of those heroic mental and moral qualities by which a good constitution is preserved. In his eighth year Benjamin, who never could remember when he did not know how to read, was placed at school, his parents intending him for the church. That purpose, however, was soon abandoned, and in his tenth year he was taken from school to assist his father, who, though bred a dyer, had taken up, on his arrival in New England, the business of tallow-chandler and soap-boiler. The lad worked at this, to him, most distasteful business, until his twelfth year, when he was apprenticed to his elder brother James, then just returned from England with a new printing press and fount of type, with which he proposed to establish himself in the printing business. In 1720–21 James Franklin also started a newspaper, the second that was published in America, called *The New England Courant.* Benjamin's tastes inclined him rather to intellectual than to any other kind of pleasures, and his judgment in the selection of books was excellent. At an early age he had made himself familiar with the *Pilgrim's Progress*, with Locke *On the Understanding*, and with some odd volumes of the *Spectator*, then the literary novelty of the day, which he turned to good account in forming the style which made him what he still remains, the most uniformly readable writer of English who has yet appeared on his side of the Atlantic. His success in reproducing articles he had read some days previously in the *Spectator* led him to try his hand upon an original article for his brother's paper, which he sent to him anonymously. It was accepted, and attracted some attention. The experiment was repeated until Benjamin had satisfied himself that his success was not an accident, when he threw off his disguise. He thought that his brother treated him less kindly after this disclosure; but that did not prevent James from publishing his paper in Benjamin's name when, in consequence of some unfortunate paragraphs which appeared in its columns, he could only obtain his release from prison, to which the colonial assembly had condemned him, upon condition that he "would no longer print the *New England Courant.*" The relations of the two brothers, however, gradually grew so inharmonious that Benjamin determined to quit his brother's employment and leave New England. He sold some of his books, and with the proceeds, in October, 1723, he found his way to the city of Philadelphia, where, 400 miles from home, at the immature age of seventeen, without an acquaintance, and with only a few pence in his pocket, he was fortunate enough to get employment with a Jew printer named Keimer. Keimer was not a man of business, and knew very little of his trade, nor had he any very competent assistants. Franklin who was a rapid composer, ingenious and full of resources, soon came to be recognized by the public as the master spirit of the shop, and to receive flattering attentions from prominent citizens who had had opportunities of appreciating his cleverness. Among others, Sir William Keith, the governor of the province, who may have possessed all the qualifications for his station except every one of the few which are quite indispensable to a gentleman, took him under his patronage, and proposed to start him in business for himself, and to give him the means of going to England and purchasing the material necessary to equip a new printing office. Franklin, rather against the advice of his father, whom he revisited in Boston to consult about it, embraced the governor's proposal, took passage for London, which he paid with his own money (the governor being more ready with excuses than coin), and on reaching London in December, 1724, where he had been assured he would find a draft to cover his expenses, discovered too late that he had been the dupe of Keith, and that he must rely upon his own exertions for his daily bread. He readily found employment at Palmer's, then a famous printer in Bartholomew Close, where, and afterwards at Wall's printing house, he continued to be employed until the 23d of July, 1726, when he again set sail for Philadelphia in company with a Mr. Dunham, whose acquaintance he had made on his voyage out, and who tempted him back by the offer of a position as clerk in a commercial business which he proposed to establish in Philadelphia. While in London Franklin had been engaged in setting up the type of a second edition of Wollaston's *Religion of Nature.* The perusal of this work led him to write and print a small edition of a pamphlet, which he entitled *A Dissertation on Liberty and Necessity, Pleasure and Pain.* Had he deferred printing it a few years, it would probably never have been heard of, for he lived to be rather ashamed of it. It procured him, however, the acquaintance of Dr. Mandeville, author of the *Fable of the Bees*, whom he described as a most facetious and entertaining companion. Only a few months after Franklin's return to Philadelphia, the death of Mr. Dunham put an end to his career as a merchant. While awaiting something more favorable, he was induced by large wages to return to his old employer Keimer. This led to his making the acquaintance of a young man of the name of Meredith, whom he afterwards described as a "Welsh Pennsylvanian, thirty years of age, bred to country work, honest, sensible, who had a great deal of solid observation, was something of a reader, but given to drink." He was learning the printer's art, and offered to furnish the capital to establish a new printing office—his father being a man of some means—if Franklin would join him and direct the business. This proposal was accepted, the types were sent for, a house was rented at £20 a year, part of which was sublet to a glazier who was to board them, and before the expiration of a year from his return to Philadelphia, Franklin, for the first time in his life, was in business for himself. "We had scarce opened our letters and put our press in order," he says, "before George House, an acquaintance of mine, brought a countryman to us whom he had met in the street inquiring for a printer. All our cash was now expended in the variety of particulars we had been obliged to procure, and this countryman's five shillings, being our first-fruits, and coming so seasonably, gave us more pleasure than any crown I have since earned, and the gratitude I felt towards House has made me often more ready than perhaps I should otherwise have been to assist young beginners."

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[1] "Es scheint dass selber die Araber ihr eignes Räuchwerk nicht hoch schätzen; denn die Vornehmen in Jemen brauchen gemeiniglich indianisches Räuchwerk, ja eine grosse Menge Mastix von der Insel Scio" (*Beschreibung von Arabien*, p. 143, Kopenh., 1772).

[2] "De Arabibus minus mirum, qui nigricantem colorem, quo Thus Indicum præditum esse vult Dioscorides [lib. i. c. 70], Indum plerumque vocent, ut ex Myrobalano nigro quem Indum appellant, patet" (*op. sup. cit.*, p. 157).

Almost simultaneously, in September, 1729, he bought for a nominal price the *Pennsylvania Gazette*, a newspaper which Keimer had started nine months before to defeat a similar project of Franklin's which accidentally came to his knowledge. It had only 90 subscribers. His superior arrangement of the paper, his new type, some spirited remarks on a controversy then waging between the Massachusetts assembly and Governor Burnet (a son of the celebrated Bishop Gilbert Burnet) brought his paper into immediate notice, and his success, both as a printer and as a journalist, was from that time forth assured and complete. The influence which he was enabled to exert by his pen through his paper, and by his industry and good sense, bore abundant fruit during the next seventeen years, during which he was at the head of journalism in America. In 1731 he established the first circulating library on the continent; in 1732 he published the first of the *Poor Richard's Almanacs*, a publication which was continued for twenty-five years, and attained a marvellous popularity. The annual sale was about 10,000 copies, at that time far in excess of any other publication in the colonies, and equivalent to a sale at the present time of not less than 300,000. In the next ten years he acquired a convenient familiarity with the French, Italian, Spanish, and Latin languages.

In 1736 Franklin was chosen a clerk of the general assembly, and was re-elected the following year. He was then elected a member of assembly, to which dignity he was re-elected for ten successive years, and was appointed one of the commissioners to treat with the Indians at Carlisle. In 1737 Colonel Spotswood, then postmaster-general, appointed him deputy postmaster at Philadelphia. About this time he organized the first police force and fire company in the colonies, and a few years later initiated the movements which resulted in the foundation of the university of Pennsylvania and of the American Philosophical Society, in the organization of a militia force, in the paving of the streets, and in the foundation of a hospital; in fact, he furnished the impulse to nearly every measure or project which contemplated the welfare and prosperity of the city in which he lived. It was during this period, and in the midst of these very miscellaneous avocations, that he made the discoveries in electricity which have secured him undisputed rank among the most eminent of natural philosophers. He was the first to demonstrate that lightning and electricity were one. The Royal Society, when an account of his experiments, which had been transmitted to a scientific friend in England, was laid before it, made sport of them, and refused to print them. Through the recommendation of his friend they were printed, however, in an extra number of the *Gentleman's Magazine*, of which the publisher ultimately sold five editions. A copy chancing to fall into the hands of Buffon, he saw their value, and advised their translation and publication in France, where they immediately attracted attention. The "Philadelphia experiments," as they were called, were performed in the presence of the royal family in Paris, and became the sensation of the period. The Royal Society of London found it necessary to reconsider its action, published a summary of the experiments in its *Transactions*, and, as Franklin afterwards averred, more than made him amends for the slight with which it had before treated him, by electing him an honorary member, exempting him from the customary payments, and sending him for the rest of his life a copy of the *Transactions*. Since the introduction of the art of printing, it would be difficult to name any discovery which has exerted a more important influence upon the industries and habits of mankind.

In 1754 a war with France was impending, and Franklin, who by this time had become the most important man in the colony of Pennsylvania, was sent to a congress of commissioners from the different colonies, ordered by the Lords of Trade to convene at Albany, to confer with the chiefs of the Six Nations for their common defence. Franklin there submitted a plan for organizing a system of colonial defence which was adopted and reported; it provided for a president-general of all the colonies to be appointed by the crown, and a grand council to be chosen by the representatives of the people of the several colonies. The colonies so united, he thought, would be sufficiently strong to defend themselves, and there would then be no need of troops from England. Had this course been pursued, the subsequent pretence for taxing America would not have been furnished, and the bloody contest it occasioned might have been avoided. The Lords of Trade, however, feared that any such union of the colonies would reveal to them their strength; and the project of union, though accompanied with a recommendation from the governor of the province of Pennsylvania, when it was brought into the assembly, as it was during Franklin's casual absence from the hall, was rejected. This Franklin thought a mistake. "But such mistakes," he said, "are not new; history is full of the errors of states and princes. Those who govern, having much business on their hands, do not generally like to take the trouble of considering and carrying into execution new projects. The best public measures are therefore seldom adopted from previous wisdom, but forced by the occasion." Instead of allowing the colonists to unite and defend themselves, the home Government sent over General Braddock with two regiments of regular English troops, whom the colonists were expected to maintain. The proprietaries, Thomas and Richard Penn, sons of William Penn, and the hereditary governors of the colonies, however, "with incredible meanness," instructed their deputies—the governors they sent out—to pass no act for levying the necessary taxes unless their vast estates were in the same act exempt. They even took bonds of their deputies to observe these instructions. The assembly finally, "finding the proprietaries obstinately persisted in manacling their deputies with instructions inconsistent not only with the privileges of the people but with the service of the crown,"—we are quoting the language of Franklin,—"resolved to petition the king against them," and appointed Franklin as their agent to go to England and present their petition. He arrived in London on the 27th July, 1757, not this time as a poor printer's boy, but as a messenger to the most powerful sovereign in the world from a corporate body of some of his most loyal subjects.

Franklin lost no time, after reaching London, in waiting upon Lord Grenville, then president of the council, and held with him a conversation which he deemed of so much importance that he made a record of it immediately upon returning to his lodgings. Nor did he exaggerate its importance, for in it were the germs of the revolt and independence of the North American colonies. "You Americans," said Grenville, "have wrong ideas of the nature of your constitution; you contend that the king's instructions to his governors are not laws, and think yourselves at liberty to regard or disregard them at your own discretion. But those instructions are not like the pocket instructions given to a minister going abroad for regulating his conduct in some trifling point of ceremony. They are first drawn up by judges learned in the law; they are then considered, debated, and perhaps amended in council, after which they are signed by the king. They are then, so far as they relate to you, the *law of the land*, for the king is the legislature of the colonies." Franklin frankly told his lordship that this was new doctrine,—that he understood from the colonial charters that the laws of the colonies were to be made by their assemblies, approved by the king, and when once approved the king alone could neither alter nor amend them.

Franklin admits that he was alarmed by this conversation, but he was not as much alarmed as he had reason to be, for it distinctly raised the issue between the king and a fraction of his people which was to require a seven years' war to decide. Franklin next sought an interview with the brothers Penn to lay before them the grievances of the assembly. Finding them entirely inaccessible to his reasonings, he supplied the material for an historical review of the controversy between the assembly and the proprietaries, which made an octavo volume of 500 pages. The success of Franklin's mission thus far was not encouraging, for he appealed to a class largely interested in the abuses of which he complained. Meantime, Governor Denny, who had been recently sent out to the province by the proprietaries, tired of struggling with the public opinion which was surging about him in Pennsyvania, and in disregard of his instructions, assented to the passing of laws which taxed equally the entire landed property of the province, and assumed that the assembly was the proper judge of the requirements of the people it represented. An equivalent in paper money was issued upon the faith of this tax. The proprietaries were very angry with the governor, recalled him, and threatened to prosecute him for a breach of his instructions. But they never carried their threat into execution.

The subject of "taxing all estates," after a careful discussion by counsel on both sides in London, was finally referred to a committee of the privy council for plantations, who reported adversely to the petitioners whom Franklin represented. Disappointed, but not discouraged, he suggested a compromise involving a personal engagement on his part that, among other things, the assembly should pass an act exempting from taxation the *unsurveyed* waste lands of the Penns' estate, and secure the assessment of the surveyed waste lands at the usual rate at which other property of that description was assessed. Upon this proposal, to the infinite disgust of the Penns, a favorable report was made, and approved by the king, George II., then within a few weeks of his death. "Thus," wrote Franklin, a few days later, to Lord Kames, "the cause is at length ended, and in a great degree to our satisfaction." Franklin's stipulation gave to the Penns nothing, in fact, which they had not always had, and therefore the assembly never passed the superfluous act for securing it. They did, however, relieve Pennsylvania from the financial embarrassments that must have followed the repeal of a money bill which had already been a year in operation, and it established the principle till then denied by the proprietaries, that their estates were subject to taxation. The success of his first foreign mission, therefore, was substantial and satisfactory.

During this sojourn of five years in England, Franklin made many valuable friends outside court and political circles, among whom the names of Hume, Robertson, and Adam Smith are conspicuous. In the spring of 1759, he received the degree of doctor of laws from the Scottish university of St. Andrews. He also made active use of his marvellous and unsurpassed talent for pamphleteering. He wrote for the *Annual Register*, of which young Edmund Burke was then editor, and with whom, at a later day, he was destined to have closer relations, a paper "On the Peopling of Countries," traces of which may readily be discerned in the first book of *The Wealth of Nations*. In this paper Franklin combated the popular delusion that the people and wealth of the colonies were necessarily so much population and wealth abstracted from the mother country, and he estimated that the population of the colonies, by doubling once in every twenty-five years, would, at the end of a century, give a larger English population beyond the Atlantic than in England, without at all interfering with the growth of England in either direction. Franklin's conjecture, that the population of the colonies would double every twenty-five years, commended itself to the judgment of Adam Smith, who adopted it; and it has thus far been vindicated by the census.

On the 25th of October, 1760, King George II. died, and his grandson ascended the throne. A clamor for peace followed. Franklin was for a vigorous prosecution of the war then pending with France, and wrote what purported to be a chapter from an old book, which he said was written by a Spanish Jesuit to an ancient king of Spain, entitled, *On the Means of disposing the Enemy to Peace*. It was ingenious and had a great effect, and, like everything Franklin wrote, is about as readable to-day as when first printed. Soon after the capture of Quebec, Franklin wrote a more elaborate paper, entitled, *The Interests of Great Britain considered with regard to her Colonies and the Acquisitions of Canada and Guadeloupe.* Its purpose was to show that, while Canada remained French, the English colonies of North America could never be safe nor peace in Europe permanent. Tradition reports that this pamphlet had great weight in determining the ministry to retain Canada, which, thanks in a large degree to his foresight and activity, is to-day one of the brightest jewels in the English crown. "I have long been of opinion," he wrote about this time to Lord Kames, "that the foundations of the future grandeur and stability of the British empire lie in America; and though, like other foundations, they are low and little now, they are nevertheless broad and strong enough to support the greatest political structure that human wisdom ever erected. I am, therefore, by no means for restoring Canada. If we keep it, all the country from the St. Lawrence to the Mississippi will in another century be filled with British. Britain will become vastly more populous by the immense increase of its commerce. The Atlantic sea will be covered with your trading ships; and your naval power, thence continually increasing, will extend your influence round the whole globe and awe the world." What Englishman can read these papers to-day without a feeling of regret that Franklin was not permitted to occupy a seat in parliament as one of the representatives of the British colonies, so that England and the world might have had the advantage in a larger measure of his rare wisdom, sagacity, and patriotism?

Franklin sailed again for America in August, 1762, after an absence of five years, during which he had found an opportunity of visiting large portions of the Continent, and of acquiring information about European affairs both in and out of England, which made him more than ever an enlightened and trustworthy authority in America upon all foreign questions affecting the interests of the colonists. The peace with the proprietary government was only temporary. The question of taxing their estates had come up in a new form, and finally resulted in a petition from the assembly drawn by Franklin himself for a change of government for Pennsylvania. The election which took place in the fall of 1764 turned upon the issue raised in this petition, and the proprietary party succeeded, by a majority of 28 votes out of 4000, in depriving Franklin of the seat to which he had been chosen for fourteen successive years in the provincial assembly. The victory, however, was a barren one, for no sooner did the assembly convene than it resolved again to send Franklin as its special agent to England to take charge of their petition for a change of government, and to look after the interests of the province abroad. On the 7th of November following his defeat, he was again on his way across the Atlantic. We may as well here say at once that the petition which he brought with him for a change of government came to nothing. Franklin presented it, and the Penns opposed it; but matters of so much graver consequence continually arose between 1765, when it was presented, and 1775, when the revolution began, that it was left to the final disposition of time. The Penns at last had the sagacity to sell betimes what they were not wise enough to keep. The State of Pennsylvania gave them £130,000 for their interest in its soil, and the British Government settled upon the head of the family a pension of £4000 a year.

Early in the year 1764 Grenville, the prime minister, had sent for the agents of the American colonies resident in London, and told them that the war with France which had just terminated had left upon England a debt of £73,000,000 sterling, and that he proposed to lay a portion of this burden upon the shoulders of the colonists by means of a stamp duty, unless the colonists could propose some other tax equally productive and less inconvenient. He directed the agents to write to their several assemblies for instructions upon this point. The assembly of Pennsylvania, which expressed the sentiment of all the colonies, was decidedly of the opinion that to tax the colonies, which were already taxed beyond their strength, and which were surrounded by aboriginal enemies and exposed to constant expenditures for defence, was cruel, but to tax them by a parliament in which they were not represented was an indignity. While such was their feeling, they allowed it to be understood that they would not reject any requisition of their king for aid, and if he would only signify his needs in the usual way, the assembly would do their utmost for him. These views were summed up in a "resolution" thus expressed: "that, as the assembly always had, so they always should think it their duty to grant aid to the crown according to their abilities, whenever required of them in the usual manner." To prevent the introduction of such a bill as the ministry proposed, and which Franklin characterized as "the mother of mischief," he left no stone unturned, by personal intercession, by private correspondence, and through the press. At last, in despair, he, with his associate agents, sought an interview with the minister. They found him inexorable. The Government wanted the money, and it did not wish to recognize the principle upon which the colonists resisted the Government method of obtaining it. The bill was introduced, and was promptly passed, only 50 voting against it in the Commons, and the Lords not dividing upon it. The sum expected from this tax being only £100,000, it was thought the colonists would soon be reconciled to it. This was evidently Franklin's hope, which he did his utmost to realize. Writing home to a friend shortly after the passage of the Act he said, "The tide was too strong for us. We might as well have hindered the sun's setting; but since it is down, my friend, and it may be long before it rises again, let us make as good a night of it as we can. We may still light candles. Frugality and industry will go a great way towards indemnifying us. Idleness and pride tax with a heavier hand than kings and parliament." But when the news of the passage of the Stamp Act reached the colonies, and its provisions came to be scanned,[1] the indiscretion of those who advised it was manifest. Meetings were held in all the colonies, where resolves were passed unanimously to consume no more British manufactures until the hateful Act was repealed. For simply recommending a trusty person to collect the tax, Franklin himself was denounced, and his family in Philadelphia was in danger of being mobbed. The Act not only failed of its purpose in producing a revenue, but before it went into operation a formidable agitation for its repeal had already commenced.

The succeeding session of parliament, which began in December, 1765, is specially memorable for Franklin's examination before a committee of the House on the effects of the Stamp Act; for the magnificent parliamentary début of Edmund Burke, whose speeches for the repeal, said Dr. Johnson, "filled the town with wonder;" and for the repeal of the offensive act by a majority of 108. The first six weeks of this session were devoted to taking testimony at the bar of the House on American affairs, and especially upon the probable advantages and disadvantages of the Stamp Act. Franklin was the only one of the witnesses who lifted a voice that could be heard by posterity. Burke said the scene reminded him of a master examined by a parcel of schoolboys. George Whitfield, the great field preacher, wrote—"Our trusty friend, Dr. Franklin, has gained immortal honor by his behavior at the bar of the House. The answer was always found equal to the questioner. He stood unappalled, gave pleasure to his friends, and did honor to his country." The examination was first published in 1767, without the name of printer or of publisher, and the following remarks upon it appeared in the *Gentleman's Magazine* for July of that year. "From this examination of Dr. Franklin the reader may form a clearer and more comprehensive idea of the state and disposition of America, of the expediency or inexpediency of the measure in question, and of the character and conduct of the minister who proposed it, than from all that has been written upon the subject in newspapers and pamphlets, under the titles of essays, letters, speeches, and considerations, from the first moment of its becoming the object of public attention till now. The questions in general were put with great subtlety and judgment, and they are answered with such deep and familiar knowledge of the subject, such precision and perspicuity, such temper and yet such spirit, as do the greatest honor to Dr. Franklin, and justify the general opinion of his character and abilities."

The light thrown upon colonial affairs by Franklin's examination, more probably than all other causes combined, determined parliament to repeal the bill almost as soon as it was to have gone into operation, and immediately after the conclusion of Franklin's examination. It was to Franklin a never-to-be-forgotten triumph. He celebrated it characteristically. "As the Stamp Act," he wrote to his wife, "is at length repealed, I am willing you should have a new gown, which you may suppose I did not send sooner as I knew you would not like to be finer than your neighbors unless in a gown of your own spinning. Had the trade between the two countries totally ceased, it was a comfort to me to recollect that I had once been clothed, from head to foot, in woollen and linen of my wife's manufacture, that I never was prouder of my dress in my life, and that she and her daughter might do it again if it was necessary. I told the parliament that it was my opinion, before the old clothes of the Americans were worn out, they might have new ones of their own making. I have sent you a fine piece of Pompadour satin, 14 yards, cost 11s. a yard; a silk négligée and petticoat of brocaded lute string, for my dear Sally [his daughter]; with two dozen gloves, four bottles of lavender water, and two little reels."

The news of the repeal filled the colonists with delight, and restored Franklin to their confidence and affection. From that time until the end of his days he was, on the whole, the most popular man in America. Unhappily the repeal of the Stamp Act was a concession to the commercial interests of the mother country, not to the political dogmas of the colonists. The king's party was more irritated than instructed by its defeat, and instead of surrendering any of its pretensions to tax the colonies, almost immediately brought in a bill, which was passed, asserting the absolute supremacy of parliament over the colonies, and in the succeeding parliament another bill, which also passed, imposing duties on the paper, paints, glass, and tea imported by the colonies. This tax was resented by the colonies with no less bitterness and determination than they had resented the Stamp Act. It conveyed sterility into their recent triumph, and aroused a feeling akin to disloyalty. It made the minor differences among the colonists disappear, and crystallized public opinion with marvellous rapidity around the principle of "no taxation without representation,"—a principle which it was impossible to make acceptable to the king, whose old-fashioned notions of the royal prerogative had only been confirmed and strengthened by the irritating pertinacity of the colonists. Thus the issue was gradually made up between the mother country and its American dependencies. Each party felt that its first duty was to be firm, and that any concession would be disastrous as well as dishonorable. Such a state of feeling could terminate but in one way. It is now clear to all, as it was then clear to a few, that the passing of the tea and paper bill, made the difference between the crown and the colonists irreconcilable, and that nothing but the death of the king could prevent a war. The nine succeeding years were spent by the contending parties in struggling for position,—the colonies becoming more indifferent to the mother country, and the mother country less disposed to put up with the pretensions of her offspring. Franklin, when he went to London in 1764, confidently expected to return in the following year; but he was not destined to leave England till ten years later, and then with the depressing suspicion that the resources of diplomacy were exhausted. Meantime he remitted no effort to find some middle ground of conciliation. Equipped with the additional authority derived from commissions to act as the agent of the provinces of Massachusetts, of New Jersey, and of Georgia, and with a social influence never possessed probably by any other American representative at the English court, he would doubtless have prevented the final alienation of the colonies, if such a result, under the circumstances, had been possible. But it was not. The colonists were Englishmen for the most part, and they could not be brought to make concessions which would have dishonored them; and Franklin was not the man to ask of them such concessions. He took the position that "the parliament had no right to make any law whatever binding the colonies; that the king, and not the king, Lords, and Commons collectively, was their sovereign; and that the king, with *their* respective parliaments, is their only legislator." In other words, he asked only what England has since granted to all her colonies, and what, but for the fatuous obstinacy of the king, who at this time was rather an object of commiseration than of criticism, she would undoubtedly have yielded. But under the pressure of the crown, negotiation and debate seemed rather to aggravate the differences than to remove them. The solemn petitions of the colonists to the throne were treated with neglect or derision, and their agents with contumely, and Franklin was openly insulted in the House of Lords, was deprived of his office of deputy-postmaster, and was scarcely safe from personal outrage. Satisfied that his usefulness in England was at an end, he placed his agencies in the hands of Arthur Lee, an American lawyer practising at the London bar, and on the 21st of March, 1775, again set sail for Philadelphia. On reaching home his last hope of maintaining the integrity of the empire was dissipated by the news which awaited him of collisions which had occurred, some two weeks previous, between the people and the royal troops at Concord and at Lexington. He found the colonies in flagrant rebellion, and himself suddenly transformed from a peacemaker into a warmaker.

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[1] One clause of the Act provides that the Americans shall have no commerce, make no exchange of property with each other, neither purchase, nor grant, nor recover debts; they shall neither marry nor make their wills unless they pay such and such sums in specie for the stamps which are to give validity to the proceedings. Franklin testified under oath before a committee of parliament that such a tax would drain the Government of all their specie in a single year.

The two years which followed were among the busiest of his life. The very morning of his arrival he was elected, by the Assembly of Pennsylvania, a delegate to that continental congress then sitting in Philadelphia which consolidated the armies of the colonies, placed George Washington in command of them, issued the first continental currency, and assumed the responsibility of resisting the imperial government. In this congress he served on not less than ten committees. One of its first measures was to organize a continental postal system and to make Franklin postmaster-general. Thus he was avenged for his dismissal 18 months before from the office of deputy by being appointed to a place of higher rank and augmented authority. He planned an appeal for aid from the king of the French, and wrote the instructions of Silas Deane, a member of the congress, who was to convey it; he was sent as one of three commissioners to Canada, in one of the most inclement months of the year, on what proved an ineffectual mission to persuade the Canadians to join the new colonial union; he was elected a delegate from Philadelphia to the conference which met on the 18th of June, 1776, and which, in the name of the people of the colonies, formally renounced all allegiance to King George, and called for an election of delegates to a convention to form a constitutional government for the United Colonies. He was also one of the committee of five which drew up what is known as the "Declaration of Independence." When about to sign it, Hancock, one of his colleagues, is reported to have said, "We must be unanimous; there must be no pulling different ways; we must all hang together." "Yes," replied Franklin, "we must hang together, or we will be pretty sure to hang separately." He was also chosen president of the convention called to frame a constitution for the State of Pennsylvania, which commenced its session on the 16th of July, 1776. He was selected by congress to discuss terms of peace with Admiral Lord Howe, who had arrived in New York harbor on the 12th of July, 1776, to take command of the British naval forces in American waters, and on the 26th of September, upon the receipt of encouraging news from France, he was chosen unanimously to be one of three to repair to the court of Louis XVI. and solicit his support. His colleagues were John Adams, destined to be Washington's successor in the presidency, and Arthur Lee, Franklin's successor in the agency in London.

Franklin, now in the seventieth year of his age, proceeded to collect all the money he could command, amounting to between £3000 and £4000, lent it to congress, and with two grandsons set sail in the sloop of war "Reprisal" on the 27th day of October, arriving at Nantes on the 7th of December, and at Paris towards the end of the same month. With his usual tact and forecast he found quartérs in a house in Passy (then a suburb but now a part of the city of Paris) belonging to an active friend of the cause he represented—Le Ray de Chaumont—who held influential relations with the court, and through whom he was enabled to be in the fullest communication with the French Government without compromising it.

At the time of Franklin's arrival in Paris, he was already one of the most talked about men in the world. He was a member of every important learned society in Europe; he was a member, and one of the managers of the Royal Society, and one of eight foreign members of the Royal Academy of Sciences in Paris. Three editions of his scientific works had already appeared in Paris, and a new edition, much enlarged, had recently appeared in London. To all these advantages he added a political purpose—the dismemberment of the British empire—which was entirely congenial to every citizen of France. "Franklin's reputation," wrote Mr. Adams, who, unhappily, was never able to regard his colleague's fame with entire equanimity, "was more universal than that of Leibnitz or Newton, Frederick or Voltaire, and his character more beloved and esteemed than all of them. . . . If a collection could be made of all the gazettes of Europe for the latter half of the 18th century a greater number of panegyrical paragraphs upon *le grand Franklin* would appear, it is believed, than upon any other man that ever lived."

"Franklin's appearance in the French salons, even before he began to negotiate," says the German historian Schlosser, "was an event of great importance to the whole of Europe. . . . His dress, the simplicity of his external appearance, the friendly meekness of the old man, and the apparent humility of the Quaker, procured for Freedom a mass of votaries among the court circles who used to be alarmed at its coarseness and unsophisticated truths." We may here add that such was the number of portraits, busts, and medallions of him in circulation before he left Paris that he would have been recognized from them by nearly every adult citizen in any part of the civilized world. Writing to his daughter in the third year of his residence in Paris, of a medallion to which she had alluded, he says—"A variety of others have been made since, of different sizes; some to be set in the lids of snuff-boxes and some so small as to be worn in rings, and the numbers sold are incredible. These, with the pictures, busts, and prints (of which copies are spread everywhere) have made your father's face as well known as the moon, so that he durst not do anything that would oblige him to run away, as his phiz would discover him wherever he should venture to show it."

The story of Franklin's mission to France, as recorded in his own correspondence, is singularly interesting and romantic. In these respects it is difficult to find its parallel in the literature of diplomacy. Its results may be summed up in a few words. He became at once, as already stated, an object of greater popular interest than any other man in France,—an interest which, during his eight years' sojourn there, seemed always on the increase. Streets in numerous cities, and several societies, were named after him; the French Academy paid him its highest honors, and he conferred more distinction upon any salon he frequented than it could reciprocate. He animated French society with a boundless enthusiasm for the cause of the rebel colonists, persuaded the Government that the interests of France required her to aid them, obtained a treaty of alliance at a crisis in their fortunes in the winter of 1777, when such an alliance was decisive, and the great moral advantage of a royal frigate to convey the news of it to America. A few months later he signed the treaties which bound the two countries to mutual friendship and defence, and on the morning of the 20th March, 1778, the three envoys were formally received by the king at Versailles, and through them the country they represented was first introduced into the family of independent nations.

In February of the following year General Lafayette, who had distinguished himself as a volunteer in the rebel army, returning to France on leave, brought a commission from the American congress to Dr. Franklin as sole plenipotentiary of the United States to the court of France. From this time until the close of the war it was Franklin's paramount duty to encourage the French Government to supply the colonists with money. How successfully he discharged this duty may be inferred from the following statement of the advances made by France upon his solicitation:—In 1777, 2,000,000 francs; in 1778, 3,000,000 francs; in 1779, 1,000,000 francs; in 1780, 4,000,000 francs; in 1781, 10,000,000 francs; in 1782, 6,000,000 francs,—26,000,000 francs in all. To obtain these aids at a time when France was not only at war, but practically bankrupt, and in defiance of the strenuous resistance of Necker, the minister of finance, was an achievement, the credit of which, there is the best reason for believing, was mainly due to the matchless diplomacy of Franklin. Writing to the French minister in Philadelphia, December 4, 1780, the Count de Vergennes said—

> "As to Dr. Franklin, his conduct leaves congress nothing to desire. It is as zealous and patriotic as it is wise and circumspect, and you may affirm with assurance, on all occasions where you think proper, that the method he pursues is much more efficacious than it would be if he were to assume a tone of importunity in multiplying his demands, and above all in sup-

> porting them by menaces (an allusion to the indiscreet conduct of Franklin's colleagues), to which we should give neither credence nor value, and which would only tend to render him personally disagreeable."

Again, February 15, 1781, Vergennes wrote:—

> "If you are questioned respecting an opinion of Dr. Franklin, you may without hesitation say that we esteem him as much on account of the patriotism as the wisdom of his conduct; and it has been owing in a great part to this cause, and the confidence we put in the veracity of Dr. Franklin, that we have determined to relieve the pecuniary embarrassments in which he has been placed by congress. It may be judged from this fact, which is of a personal nature, if that minister's conduct has been injurious to the interests of his country, or if any other would have had the same advantages."

Franklin had been for some years a martyr to the gout, which, with other infirmities incident to his advanced age of seventy-five, determined him to ask congress, in 1781, to relieve him, in a letter so full of dignity and feeling, that no one can read it even now, after the lapse of nearly a century, without emotion.

> "I must now," he wrote, after disposing of official topics, "beg leave to say something relating to myself—a subject with which I have not often troubled congress. I have passed my seventy-fifth year, and I find that the long and severe fit of the gout which I had the last winter had shaken me exceedingly, and I am yet far from having recovered the bodily strength I before enjoyed. I do not know that my mental faculties are impaired—perhaps I shall be the last to discover that—but I am sensible of great diminution of my activity, a quality I think particularly necessary in your minister at this court. I am afraid, therefore, that your affairs may some time or other suffer by my deficiency. I find also that the business is too heavy for me and too confining. The constant attendance at home, which is necessary for receiving and accepting your bills of exchange (a matter foreign to my ministerial functions), to answer letters, and perform other parts of my employment, prevents my taking the air and exercise which my annual journeys formerly used to afford me, and which contributed much to the preservation of my health. There are many other little personal attentions which the infirmities of age render necessary to an old man's comfort, even in some degree to the continuance of his existence, and with which business often interferes.
>
> "I have been engaged in public affairs, and enjoyed public confidence in some shape or other during the long term of fifty years, and honor sufficient to satisfy any reasonable ambition; and I have no other left but that of repose, which I hope the congress will grant me by sending some person to supply my place. At the same time I beg they may be assured that it is not any the least doubt of their success in the glorious cause, nor any disgust received in their service, that induces me to decline it, but purely and simply the reasons I have mentioned. And as I cannot at present undergo the fatigues of a sea voyage (the last having been almost too much for me), and would not again expose myself to the hazard of capture and imprisonment in this time of war, I propose to remain here at least till the peace—perhaps it may be for the remainder of my life—and if any knowledge or experience I have acquired here may be thought of use to my successor, I shall freely communicate it and assist him with any influence I may be supposed to have, or counsel that may be desired of me."

Congress not only declined to receive his resignation, but with its refusal sent him a commission, jointly with John Adams and John Jay, who had been the agent of the congress in Spain, to negotiate a peace. Cornwallis had surrendered at Yorktown on the 17th of October of that year, the anniversary of Burgoyne's disastrous surrender at Saratoga just four years before, and a farther prosecution of the war beyond what might be necessary to secure the most favorable terms of peace was no longer advocated by any party in England. Active negotiations with Franklin and his associates were opened, and on the 30th of November a preliminary treaty was signed by the English and American commissioners; a definitive treaty was signed on the 30th of September, 1783, and ratified by congress January 14, 1784, and by the English Government on the 9th of April following. At the conclusion of the preliminary treaty Franklin renewed his application to congress to be relieved, to which he received no answer. A few weeks after signing the definitive treaty, he renewed it again, but it was not until the 7th of March, 1785, that congress adopted the resolution which permitted "The Honorable Benjamin Franklin to return to America as soon as convenient," and three days later it appointed Thomas Jefferson to succeed him.

During his stay in Paris Franklin gave by no means all his time to political problems. He wrote a paper for the Royal Society on the subject of balloons, a topic which, under the auspices of the Montgolfiers, attracted a great deal of attention at that time in France. Sir Joseph Banks commended it for its completeness. To some one who asked the use of the new invention Franklin replied by asking, "What is the use of a new-born baby?" In 1784 he was appointed by the French Academy one of a commission ordered by the king to investigate the phenomena of "mesmerism;" and to a large extent he directed the investigation which resulted in the disgrace and flight of Mesmer and his final disappearance from the public eye. Franklin's *Information to those who would Remove to America*, his *New Treatise on Privateering*, his *Essay on Raising the Wages in Europe by the American Revolution*, his *Letter to Vaughan on Luxury*, his *Story of the Whistle*, together with his private as well as official correspondence, kept the world constantly talking about him and wondering at the inexhaustible variety and unconventional novelty of his resources. "You replace Dr. Franklin, I hear," said the Count de Vergennes to Jefferson when they first met. "I succeed, no one can replace him," was Jefferson's reply.

It was on the 12th of July, 1785, that, accompanied by some members of his family and most intimate friends, he set out for Havre on his return to America. In view of his infirmities, the queen had placed one of her litters at his disposal; the next day he was constrained by a most pressing invitation to accept the hospitality of Cardinal de la Rochefoucauld at Gaillon. At Rouen, he was waited upon by a deputation of the Academy of that city. At Portsmouth, where the party joined the vessel that was to take them home, the bishop of St. Asaph's, "the good bishop," as Franklin used to style him, an old friend and correspondent, came down with his family to see him, and remained with him for the two or three days before they sailed.

On the 13th of September Franklin, who had become by far the most widely known and the most eminent of Americans, disembarked again at the very wharf in Philadelphia on which, sixty-two years before, he had landed a houseless, homeless, friendless, and substantially penniless runaway apprentice of seventeen. The day succeeding his arrival, the assembly of Pennsylvania voted him a congratulatory address; the public bodies very generally waited upon him, and General Washington, by letter, asked to join in the public gratulations upon his safe return to America, and upon the many eminent services he had rendered. Sensible as his countrymen were of the magnitude of their obligations to him, and of his increasing infirmities, it never seems to have occurred to them that they could dispense with his services. In the month succeeding his arrival he was chosen a member of the municipal council of Philadelphia, of which he was also unanimously elected chairman. He was soon after elected by the executive council and assembly president of Pennsylvania, by seventy-six out of the seventy-seven votes cast. "I have not firmness enough," he wrote to an old friend, "to resist the unanimous desire of my country folks, and I find myself harnessed again to their service another year. They engrossed the prime of my life. They have eaten my flesh, and seem resolved now to pick my bones."

At the expiration of his term in 1786, he was unanimously re-elected, and again unanimously in 1787. He was also chosen a member of the national convention, of which Washington was a member and president, which met on the second Monday of May, 1787, to frame a constitution for the new confederacy. To the joint influence of Franklin and Washington probably should be ascribed the final adoption of the constitution which this convention framed, and which continues to be the fundamental law of the United States. The most original, if not the most ingenious, and perhaps, in view of the grave difficulties it disposed of, the most important feature of the constitution they constructed—that which gave the States equal representation in the upper house or senate and in the lower house representation according to population—was the device of Franklin. For his three years' service as president of Pennsylvania Franklin refused to accept any compensation beyond a reimbursement of the postage he had paid on official letters, amounting to some £77, 5s. 6d., it being one of his notions, which he advocated in the convention, that the chief magistrates of a nation should serve without pecuniary compensation. Franklin survived his retirement from office two years, which he consecrated almost as exclusively to the public use as any other two of his life, although most of the time the victim of excruciating pain. His pen was never more actively nor more effectively employed. He helped to organize and was president of the first society formed on the American continent or anywhere else, we believe, for the abolition of slavery, and as its president wrote and signed the first remonstrance against slavery addressed to the American congress.

Franklin died in his own house, in Philadelphia, on the 17th of April, 1790, and in the eighty-fifth year of his age. Since then, as in life, his fame has gone on increasing. No American has ever received such varied and extensive homage from his countrymen. There is no State in the United States, and there are few counties that have not a town called Franklin (Ohio has nineteen of them); scarce a town that does not boast of its Franklin Street, or its Franklin Square, or its Franklin hotel, or its Franklin bank, or its Franklin insurance company, and so on; his bust or portrait is everywhere; and some sort of a monument of Franklin is among the attractions of almost every large city.

When Franklin, the fugitive apprentice boy, in 1723, walked up Market Street on the morning of his first arrival in Philadelphia, munching the rolls in which he had invested a portion of the last dollar he had in the world, the curious spectacle he presented did not escape the attention of Miss Read, a comely girl of eighteen years who chanced to be standing in the door of her father's house when he passed. Not long after, accident gave him an introduction to her; they fell in love, and soon after his return from his trip to England he married her. By her he had two children, a son who died young, whom Franklin spoke of as the finest child he ever saw, and a daughter, Sally, who married Richard Bache, of Yorkshire, England. Mrs. Bache had eight children, from whom are descended all that are now known to inherit any of the blood of Benjamin Franklin. Before his marriage Franklin had a son whom he named William, who acted as his secretary during his first official residence in England, and who, as a compliment to the father, was made governor of the province of New Jersey. When the rebellion broke out, William adhered to the mother country, which exposed him to serious indignities and was a source of profound mortification to his father. Next to the loss of his only legitimate son, this was perhaps the greatest sorrow of Franklin's life.

> "You conceived, you say," wrote Franklin to him nine years after the rupture, "that your duty to your king and regard for your country required this. I ought not to blame you for differing in sentiments with me on public affairs. We are men all subject to errors. Our opinions are not in our own power. They are formed and governed much by circumstances that are often as inexplicable as they are irresistible. Your situation was such that few would have censured your remaining neuter, though there are natural duties which precede political ones, and cannot be extinguished by them."

Without presuming to extenuate anything that was unfilial in Governor Franklin's conduct, we cannot help remarking that Franklin, with a blindness common to parents, quite overlooked the fact that his son, when he determined to adhere to the sovereign whom he had sworn loyally to serve, was a lusty lad of forty-five years.

In his will the father left William his lands in Nova Scotia, and forgave him the debts due to him. "The part he acted against me in the late war," continued the will, "which is of public notoriety, will account for my leaving him no more of an estate he endeavored to deprive me of." Governor Franklin had a son who also was not born in wedlock, named William Temple Franklin. He was brought up by his grandfather and served him in the capacity of private secretary during most of his residence in France, and after his return to the United States. Franklin tried repeatedly but unsuccessfully to have the young man appointed to some subordinate mission. He had been brought up in France, his education was strangely deficient, and he does not seem to have left an altogether favorable impression upon his countrymen abroad or at home after his return. It would not be strange if they judged him more correctly than his grandfather did. To this grandson Franklin bequeathed most of his books and all his manuscripts and papers, from which he published the first edition of the writings of his grandfather, purporting to be complete, in 1816, and after a delay never satisfactorily explained and apparently inexcusable. A criticism of this publication, attributed to Jeffrey, appeared in the *Edinburgh Review*, No. 56, August, 1817.

Though spending more than half of his life in the public service, Franklin was never for a moment dependent upon the Government for his livelihood. With the aid of his newspaper, his frugality, and his foresight, he was enabled to command every comfort and luxury he desired through his long life, and to leave to his descendants a fortune neither too large nor too small for his fame, and valued at the time of his death at about £30,000 sterling. Though rendering to his country as a diplomatist and statesman, and to the world as a philosopher, incalculable services, he never sought nor received from either of these sources any pecuniary advantage. Wherever he lived he was the inevitable centre of a system of influences always important and constantly enlarging; and dying, he perpetuated it by an autobiography which to this day not only remains one of the most widely read and readable books in our language, but has had the distinction of enriching the literature of nearly every other. No man has ever lived whose life has been more universally studied by his countrymen or is more familiar to them.

Though his pen seemed never idle, the longest production attributed to his pen was his autobiography, of less than 300 8vo pages, and yet, whatever subject occupied his pen, he never left the impression of incompleteness. He was never tedious, and an inexhaustible humor, a classic simplicity, an exquisite grace, and uniform good sense and taste informed and gave permanent interest to everything he wrote. Franklin was not an orator, but when he spoke, as he did occasionally in the several deliberative bodies of which he was a member, his word, though brief, was, like his writings, always clear, judicious, felicitous, and potential. No man ever possessed in a greater degree the gift of putting an argument into an anecdote.

His country owes much to him for his service in various public capacities; the world owes much to the fruits of his pen; but his greatest contribution to the welfare of mankind, probably, was what he did by his example and life to dignify manual labor. While Diderot was teaching the dignity of labor in France and the folly of social standards that proscribed it, Franklin was illustrating it in America, and proving by his own most conclusive example that

"Honor and fame from no condition rise."

There are few born into this world so ill-conditioned that they cannot find comfort and encouragement from some portion of the life of Franklin; none of any station who may not meditate on it with advantage. That feature of it which is most valuable will probably be found most difficult to imitate. It is stated by himself in the following extract from his diary in 1784:—

> "*Tuesday*, 27th.—Lord Fitzmaurice called to see me, his father having requested that I should give him such instructive hints as might be useful to him. I occasionally mentioned the old story of Demosthenes's answer to one who demanded what was the first point of oratory? *Action*; the second? *Action*; the third? *Action*—which I said had been generally understood to mean the action of an orator with his hands in speaking, but that I thought another kind of 'action' of more importance to an orator who would persuade people to follow his advice, viz.—such a course of action in the conduct of life as would impress them with an opinion of his integrity as well as of his understanding; that this opinion once established, all the difficulties, delays, and oppositions usually occasioned by doubts and suspicions were prevented; and such a man, though a very imperfect speaker, would almost always carry his points against the most flourishing orator who had not the character of sincerity. To express my sense of the importance of a good private character in public affairs more strongly, I said the advantage of having it, and the disadvantage of not having it, were so great that I even believe if George III. had had a bad private character and John Wilkes a good one, the latter might have turned the former out of his kingdom."

Though Franklin was far from being insensible to what are termed worldly considerations, his public life was singularly free from any vulgar or degrading trace of self-seeking; he never is found making the public interests secondary to his own; though holding office a good portion of his life, he never treated office-holding as a profession, nor the public treasury as the accumulations of the many for the good of a few. His private affairs and the public business were never allowed to become entangled or to depend the one upon the other. Though, from the nature of his various employments, a target for every form of malevolence and detraction during the last half of his life, his word was never impeached, nor his good faith and fairness, even to his enemies, successfully questioned. Of some irregularities in his youth he early repented, and for the benefit of mankind made a public confession, and all the reparation that was possible.

The most complete edition of Franklin's works is that of Jared Sparks, in 10 vols. 8vo, Boston, 1836–40. An edition of the autobiography, revised by John Bigelow, from original MSS., appeared in 1868, and again in 1875, 3 vols. Parton's *Life and Times of Benjamin Franklin*, 2 vols., was published at New York in 1864. (J. BI.)

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FRANKLIN, Sir John (1786–1847), rear-admiral, was born at Spilsby, Lincolnshire, April 16, 1786. Sprung from a line of free-holders, or "franklins," his father inherited a small family estate, which was so deeply mortgaged by his immediate predecessor that it was found necessary to sell it; but by his success in commercial pursuits he was enabled to maintain and educate a family of twelve children. John, the youngest son, was destined for the church by his father, who, with this view, had purchased an advowson for him. He received the rudiments of education at St. Ives, and afterwards attended Louth Grammar School for two years; but having employed a holiday in walking 12 miles with a companion to look at the sea, which up to that time he knew only by description, his imagination was so impressed that he determined to be a sailor. In the hope of dispelling what he considered to be a boyish fancy, his father sent him on a trial voyage to Lisbon in a merchantman; but it being found on his return that his wishes were unchanged, an entry on the quarter-deck of the "Polyphemus," 74, Captain Lawford, was procured for him in 1800; and this ship having led the line in the battle of Copenhagen in 1801, young Franklin had the honor of serving in Nelson's hardest-fought action. Two months after the action of Copenhagen, he joined the "Investigator," discovery-ship, commanded by his relative Captain Flinders, and under the training of that able scientific officer, while employed in exploring and mapping the coasts of Australia, he acquired a correctness of astronomical observation and a skill in surveying which proved of eminent utility in his future career. Franklin was on board the "Porpoise" when that ship and the "Cato" were wrecked, August 18, 1803, on a coral reef, off the coast of Australia (see Flinders). After this misfortune, Franklin proceeded to Canton, where he obtained a passage to England in the "Earl Camden," East Indiaman, commanded by Sir Nathaniel Dance, commodore of the China fleet of 16 sail. On the 15th of February, 1804, Captain Dance repulsed a strong French squadron, led by the redoubtable Admiral Linois. In this action Franklin performed the important duty of signal midshipman. On reaching England, he joined the "Bellerophon," 74, and in that ship he was again entrusted with the signals, a duty which he executed with his accustomed coolness and intrepidity in the great battle of Trafalgar. In the "Bedford," his next ship, he attained the rank of lieutenant, and remaining in her for six years, latterly as first lieutenant, served in the blockade of Flushing, on the coast of Portugal, and in other parts of the world, but chiefly on the Brazil station, whither the "Bedford" went as part of the convoy which escorted the royal family of Portugal to Rio de Janeiro in 1808. In the ill-managed and disastrous attack on New Orleans, he commanded the "Bedford's" boats in an engagement with the enemy's gunboats, one of which he boarded and captured, receiving a slight wound in the hand-to-hand fight.

On peace being established, Franklin turned his attention once more to the scientific branch of his profession, and sedulously extended his knowledge of surveying. In 1818 the discovery of a north-west passage became again, after a long interval, a national object, and Lieutenant Franklin was appointed to the "Trent," as second to Captain Buchan of the "Dorothea," hired vessels equipped for penetrating to the north of Spitzbergen, and, if possible, crossing the Polar Sea by that route. During a heavy storm, both ships were forced to seek for safety by boring into the closely packed ice, in which extremely hazardous operation the "Dorothea" was so much damaged that her reaching England became doubtful; but the "Trent" having sustained less injury, Franklin requested to be allowed to prosecute the voyage alone, or under Captain Buchan, who had the power of embarking in the "Trent" if he chose. The latter, however, declined to leave his officers and men at a time when the ship was almost in a sinking condition, and directed Franklin to convoy him to England. Though success did not attend this voyage, it brought Franklin into personal intercourse with the leading scientific men of London, and they were not slow in ascertaining his peculiar fitness for the command of such an enterprise. To calmness in danger, promptness and fertility of resource, and excellent seamanship, he added other qualities less common, more especially an ardent desire to promote science for its own sake, and not merely for the distinction which eminence in it confers, together with a love of truth that led him to do full justice to the merits of his subordinate officers, without wishing to claim their discoveries as a captain's right. Added to this, he had a cheerful buoyancy of mind, which, sustained by religious principle of a depth known only to his most intimate friends, was not depressed in the most gloomy times. It was, therefore, with full confidence in his ability and exertions that he was, in 1819, placed in command of an expedition appointed to travel through Rupert's Land to the shores of the Arctic Sea, while Lieutenant Parry was despatched with two vessels to Lancaster Sound. At this period, the northern coast of America was known at two isolated points only, viz., the mouth of the Coppermine River, discovered by Hearne,—but placed erroneously by him four degrees of latitude too much to the north,—and the mouth of the Mackenzie. Lieutenant Franklin, accompanied by a surgeon, two midshipmen, and a few Orkneymen, embarked for Hudson's Bay, in June, 1819. His instructions left the route he was to pursue much to his own judgment, guided by the information he might be able to collect at York Factory from the Hudson's Bay Company's servants there assembled. Wintering the first year on the Saskatchewan, the expedition was fed by the Hudson's Bay Company; the second winter was spent on the "barren grounds," the party subsisting on game and fish procured by their own exertions, or purchased from their native neighbors; and in the following summer the expedition descended the Coppermine River, and surveyed a considerable extent of the sea coast to the eastward. The survivors of this expedition travelled, from their start at York Factory to their return to it again, by land and water, 5550 miles. While engaged on this service, Franklin was promoted to be a commander, and after his return to England in 1822 he obtained the post rank of captain, and was elected a fellow of the Royal Society. In the succeeding year he married Eleanor, the youngest daughter of Mr. Porden, an eminent architect.

In a second expedition, which left home in 1825 (his wife dying within the same year), Franklin descended the Mackenzie and traced the coast-line through 37 degrees of longitude, from the mouth of the Coppermine River, where his former survey commenced, to near the 150th meridian, and approaching within 160 miles of the most easterly point attained by Captain Beechey, who was co-operating with him from Behring's Strait. His exertions were fully appreciated at home and abroad. He was knighted in 1829, received the honorary degree of D.C.L. from the university of Oxford, was awarded the gold medal of the Geographical Society of Paris, and was elected in 1846 correspondent of the Paris Academy of Sciences. Though the surveys executed by himself and by a detachment under command of Dr. Richardson comprised one, and within a few miles of two, of the spaces for which a parliamentary reward was offered, the Board of Longitude declined making the award; but a bill was soon afterwards laid before parliament by the secretary of the Admiralty abrogating the reward altogether, on the ground of the discoveries contemplated having been thus effected. The results of these expeditions are described by Franklin and his companion Dr. (afterwards Sir John) Richardson in two magnificent works published in 1824–29. In 1828 he married his second wife, Jane, second daughter of Mr. John Griffin. His next official employment was on the Mediterranean station, in command of the "Rainbow," and his ship soon became proverbial in the squadron for the happiness and comfort of her officers and crew.[1] As an acknowledgment of the essential service he had rendered off Patras in the "war of liberation," he received the Cross of the Redeemer of Greece from King Otho, and after his return to England he was created Knight Commander of the Guelphic order of Hanover.

In 1836 Sir John accepted the lieutenant-governorship of Van Diemen's Land (now Tasmania). His government, which lasted till the end of 1843, was marked by several events of much interest. One of his most popular measures was the opening of the doors of the legislative council to the public. He also originated a college, endowing it largely from his private funds with money and lands, in the hope that it would eventually prove the means of affording to all parties secular and religious instruction of the highest kind. He requested Dr. Arnold to select some one competent to take the direction of this institution; and the choice fell on the Rev. John Philip Gell. In his time also the colony of Victoria was founded by settlers from Tasmania; and towards its close, transportation to New South Wales having been abolished, the convicts from every part of the British empire were sent to Tasmania. On an increase to the lieutenant-governor's salary being voted by the colonial legislature, Sir John declined to derive any advantage from it personally, while he secured the augmentation to his successors. In 1838 he founded a scientific society at Hobart Town (now called the "Royal Society of Tasmania"), the meetings of which were held in Government House, and its papers printed at his expense. He welcomed eagerly the various expeditions for exploration and surveying which visited Hobart Town under command of Captains Wickham, Stokes, Owen Stanley, and others. Conspicuous among these, and of especial interest to himself, were the French and English Antarctic expeditions of Dumont D'Urville and Sir James C. Ross,—the latter commanding the "Erebus" and "Terror," with which the name of Franklin was to be for ever so pathetically connected. A magnetic observatory, fixed at Hobart Town as a dependency of the central establishment under Colonel Sabine, was an object of deep interest up to the moment of his leaving the colony.

Thus pleasantly occupied, the years allotted to a colonial governorship drew to a close. Franklin had passed through phases of difficulty common to all governors of colonies remote from the imperial centre; and it was impossible for an impartial and high-minded ruler to avoid collision with personal interests. But that his unflinching efforts for the social as well as the political advancement of the colony were already appreciated was abundantly proved by the affection and respect universally testified by the addresses which proceeded from every section of the community, and by the demonstrations from all classes on his departure. A local newspaper, describing the scene in much detail, adds, "Thus departed from among us as true and upright a governor as ever the destinies of a British colony were entrusted to." That this was no evanescent feeling is attested by the fact that several years afterwards the colonists showed their remembrance of his virtues and services by sending to Lady Franklin a subscription of £1700 in aid of her efforts in the search for their former governor, and later still by a unanimous vote of the legislature for the erection of a statue in honor of him at Hobart Town.

Sir John found, on reaching England, that the confidence of the Admiralty in him was undiminished, as was shown by his being offered in 1845 the command of an expedition for the discovery of the North-West passage; this offer he accepted. The prestige of Arctic service and of his former experiences attracted a crowd of volunteers of all classes, from whom were selected a body of officers conspicuous for talent and energy. Thus supported, with crews carefully chosen (some of whom had been engaged in the whaling service), victualled for three years, and furnished with every appliance then known, Franklin's expedition, consisting of the "Erebus" and "Terror" (134 officers and men), with a transport ship to convey additional stores as far as Disco in Greenland, sailed from Greenhithe on the 19th of May, 1845. The ships were last seen on the 26th of July in Baffin's Bay by a whaler which was moored to an iceberg in lat. 74° 48′ N. and long. 66° 13′ W.; and at that time the expedition was proceeding prosperously. Letters written by Franklin a few days previous to that date were couched in language of cheerful anticipation of success, while those received from his officers expressed their glowing hope, their admiration of the seaman-like qualities of their commander, and the happiness they had in serving under him.

Franklin's instructions were framed (in conjunction with Sir John Barrow and upon his own suggestions) by the eminent explorers with whom his former work had closely connected him. The experience of Parry made it evident that a fresh attempt to force ships through the heavy ice seen by him to the south-west of Melville Island would be futile, as has since been fully proved. On the other hand, Franklin's surveys of the north coast of America had long before satisfied him that a navigable passage existed along it, from the Fish River to Behring's Strait. He was therefore directed to pursue a course towards the coast after he had approached the longitude of about 98° W., and was allowed the single alternative of previously examining Wellington Channel if the navigation were open. An explicit prohibition was given against a westerly course beyond the longitude of 98° W.

In 1847, though there was no real public anxiety as to the fate of the expedition, preparations began to be made for the possible necessity of succoring the explorers. As time passed, however, and no tidings of the expedition reached England, the search began in earnest; expedition after expedition was despatched in quest of them in 1848 and succeeding years, regardless of cost or hazard. In this great national undertaking Sir John's heroic wife took a part which will ennoble her name for all time. Between 1848 and 1854 about fifteen expeditions were sent out by England and America in the hope of rescuing, or at least finding traces of the missing explorers. The details of the work done by those expeditions will be given in the article on POLAR REGIONS; here we shall confine ourselves to the results, so far as the search for Franklin was concerned. Lady Franklin's exertions were unwearied; she exhausted her private funds in sending out auxiliary vessels to quarters not comprised in the public search, and by her pathetic appeals she roused the sympathy of the whole civilized world. Traces of the missing ships were discovered by Ommanney and Penney in August, 1850, and were brought home by the "Prince Albert," fitted out by Lady Franklin with the especial object of following to the southward the route which would be almost certainly taken by Franklin in carrying out his instructions. It was thus ascertained that the first winter had been spent behind Beechey Island, where they had remained at least as late as April, 1846. No further tidings were obtained until the spring of 1854, when Dr. Rae, then conducting an exploring party of the Hudson's Bay Company from Repulse Bay, was told by the Eskimo that (as was inferred) in 1850 white men, to the number of about forty, had been seen dragging a boat over the ice near the north shore of King William's Island, and that later in the same season, but before the breaking up of the ice, the bodies of the whole party were found by the natives at a point a short distance to the north-west of Back's Great Fish River, where they had perished from the united effects of cold and famine. The latter statement was afterwards disproved by the discovery of skeletons upon the presumed line of route; but indisputable proof was given that the Eskimo had communicated with members of the missing expedition, by the various articles obtained from them and brought home by Dr. Rae, who, on his return to England, claimed, and succeeded in obtaining, the reward of £10,000 offered by the Admiralty in 1849, "to any party or parties who, in the judgment of the Board of Admiralty, shall, by virtue of his or her efforts, first succeed in ascertaining" the fate of the missing expedition. On account of the information obtained by Dr. Rae, a party in two canoes under Messrs. Anderson and Stewart was in 1855 sent by Government down the Great Fish River, and they succeeded in obtaining from the Eskimo at the mouth of the river a considerable number of articles which had evidently belonged to the Franklin expedition; and many others were picked up on Montreal Island, articles evidently belonging to a boat which, it was reported, had been cut up by the Eskimo. This expedition was unable to make so thorough a search as was desirable, but it was clear from the results obtained by it, and from the examinations which had been made by the many other expeditions of all straits and inlets and coasts except the region to the north of Great Fish River, that King William's Island, the west coast of Boothia, and the neighboring sea were the fields likely to yield the most satisfactory results. It was clear that a party from the "Erebus" and "Terror" had endeavored to reach by the Fish River route the settlements of the Hudson Bay Company, and equally evident that the expedition, in making a southerly course, had been arrested within the channel into which the Great Fish River empties itself. At this time Government was wholly taken up with the events in the East, and when the war was over it was deemed useless to spend any more money and risk any more lives in what was regarded as a hopeless quest. But Lady Franklin's pious devotion to the memory of her noble husband prompted her to make one last effort to ascertain his fate; to this object she dedicated all her available means, aided, as she had been before, by the subscriptions of sympathizing friends, her judgment being confirmed by the opinion of all those best able to form one as to the hopefulness as well as the feasibility of such an attempt. Accordingly she purchased and fitted out the little yacht "Fox," which sailed from Aberdeen in July, 1857; the command was accepted by Captain (afterwards Sir) Leopold M'Clintock, whose high reputation had been won in three of the Government expeditions sent out in search of Franklin. Having been compelled to pass the first winter in Baffin's Bay, it was not till the autumn of 1858 that the expedition passed down Prince Regent's Inlet, and the "Fox" put into winter quarters at Port Kennedy, at the eastern end of Bellot Strait, between North Somerset and Boothia Felix. In the spring of 1859 three sledging parties went out, Captain (now Sir) Allen Young to examine Prince of Wales Island, Lieutenant (now Captain) Hobson the north and west coasts of King William's Island, and M'Clintock the east and south coasts of the latter, the west coast of Boothia, and the region about the mouth of Great Fish River. The search was successful so far as ascertaining the course and fate of the expedition is concerned. From the Eskimo in Boothia many relics were obtained, and reports as to the fate of the ships and men; all along the west and south coast of King William's Island remains of articles belonging to the ships were discovered, and skeletons that told a terrible tale of disaster. Above all, in a cairn at Point Victory a precious record was discovered by Lieut. Hobson that briefly told the history of the expedition up to April 25, 1848, three years after it set out full of hope. In 1845–6 the "Erebus" and "Terror" wintered at Beechey Island, on the S.W. coast of North Devon, in lat. 74° 43′ 28″ N., long. 91° 39′ 15″ W., after having ascended Wellington Channel to lat. 77° and returned by the west side of Cornwallis Island. This statement was signed by Graham Gore, lieutenant, and Charles F. Des Vœux, mate, and bore date May 28, 1847. These two officers and six men, it was further told, left the ships on May 24, 1847, no doubt for an exploring journey, at which time all was well,

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[1] The sailors, with their usual fondness for epithets, named the ship the "Celestial Rainbow" and "Franklin's Paradise."

The success of the first year's work, thus briefly stated, was greater than has been since attained within any one season in arctic service. The alternative course permitted by Franklin's instructions had been attempted but was not pursued, and in the autumn of 1846 he followed that which was especially commended to him. But on his attempting to reach the coast of America, the obstruction of heavy ice, which presses down from Melville Island through M'Clintock Channel (not then known to exist) upon King William's Island had finally arrested his progress. It must be remembered that in the chart carried out by Franklin this island was laid down as a part of the mainland of Boothia, and he therefore could pursue his way *only* down its western coast. The record that revealed all which has been briefly stated was written upon one of the forms supplied by the Admiralty to surveying vessels, to be thrown overboard after the required data had been filled in. But upon the margin around the printed form was an addendum dated the 25th April, 1848, which extinguished all hopes of a successful termination of their grand enterprise. The facts are best conveyed by the terse and expressive words of the record, which is therefore given *verbatim*:—"April 25th, 1848. H. M. Ships 'Terror' and 'Erebus' were deserted on 22d April, five leagues N.N.W. of this, having been beset since 12th September, 1846. The officers and crews, consisting of 105 souls under the command of Captain F. R. M. Crozier, landed here in lat. 69° 37′ 42″ N., long. 98° 41′ W. Sir John Franklin died on the 11th June, 1847; and the total loss by deaths in the expedition has been to this date 9 officers and 15 men." The handwriting is that of Captain Fitzjames, to whose signature is appended that of Captain Crozier, who also adds the words of chief importance, namely, that they would "start on tomorrow 26th April, 1848, for Back's Fish River." A briefer record has never been told of so tragic a story. Thus it was reserved for the latest effort of Lady Franklin to develop not only the fate of her husband's expedition, but also the steps of its progress up to crowning success, mingled indeed with disaster almost unprecedented.

All of the party had without doubt been greatly reduced through want of sufficient food, and the injurious effects of three winters in these regions. They had greatly overrated their strength in attempting to drag with them two boats, besides heavily laden sledges, and doubtless had soon been compelled to abandon much of their burden, and leave one boat on the shore of King William's Island, where it was found, near the middle of the west coast, by M'Clintock; it contained two skeletons. From the Eskimo we learn that the men dropped down as they walked, and often had to be left unburied. Although many relics were found in possession of the Eskimo, there seems no reason to believe that the retreating crews met with foul play. From all that can be gathered, one of the vessels must have been crushed in the ice and the other stranded on the shore of King William's Island, where it lay for years, forming a mint of wealth for the neighboring Eskimo. M'Clintock examined all the shores of the island with the greatest care, but found no trace of a stranded vessel.

This is all we know of the fate of Franklin and his brave men. His memory is cherished as one of the most conspicuous of the naval heroes of Britain, and as one of the most successful and daring of her explorers. He is certainly entitled to the honor of being the first discoverer of the North-West passage; the point reached by the ships brought him to within a few miles of that attained from the westward by the explorations of earlier years; he had indeed all but traversed the entire distance between Baffin's Bay and Behring's Strait. On the monument erected to Franklin by his country, in Waterloo Place, London, the honor of discovering the passage is justly awarded to him and his companions,—a fact which was also affirmed by the president of the Royal Geographical Society, when presenting to Lady Franklin in 1860 their gold medal. More recently a fine monument, erected in 1875 in Westminster Abbey, commemorates the heroic deeds and fate of Sir John Franklin, the death (which occurred in that year) of Lady Franklin, and the inseparable connection of her name with the fame of her husband. Most of the Franklin relics brought home by M'Clintock were presented by Lady Franklin to the United Service Museum, while those given by Dr. Rae to the Admiralty are deposited in Greenwich Hospital. Captain Hall, so well known in connection with the "Polaris" expedition, spent five years with the Eskimo, and made two journeys in endeavoring to trace the remnant of Franklin's party, bringing back in 1869 a number of additional relics and some information confirmatory of that given by M'Clintock. In 1878 a search expedition was sent out from America in consequence of a tale told to Mr. Barry, the mate of a whaler, by some Nechelli Eskimo, met by him at Whale Point, Hudson's Bay. He obtained from these Eskimo some spoons bearing Franklin's crest. The Eskimo were understood to say that these were received from a party of white men, who passed a winter near their settlement, and all died. The white men, the Eskimo stated, left a number of books with writing in them, which were buried. The story has some points about it that make one inclined to doubt its accuracy. Still it is satisfactory that the search party has been sent out, and we can only hope that it will be rewarded by discovering some of the records of the unfortunate expedition.[1] (J. S. K.)

FRANKS, The. When, in the year 241 A.D., the soldiers of Aurelian, who just before had been on the north German frontier, marched out of Rome on their way to the Persian war, they sang (Vopiscus *in Aureliano*, c. 7) a rough barrack song—

> "Mille Sarmatas, mille *Francos*, semel et semel occidimus;
> Mille mille mille mille mille Persas quærimus;"

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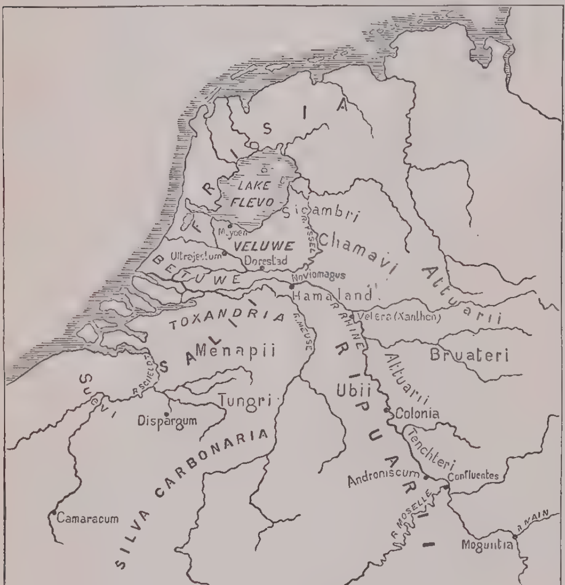
[1] The first portion of this notice is mainly from Sir John Richardson's article in last edition, and the whole has been revised by Miss Cracroft, Sir John Franklin's niece.

and the words, caught up by the admiring mob, became a street boys' ballad in those days of debased imperialism. Unless we give to Peutinger's *Itinerary* an earlier date than is probable, this street song marks the first appearance in history of the Frankish name. Cæsar, Tacitus, Ptolemy, are alike silent as to it, although they often speak of other tribes which occupied the very districts in which we afterwards find the Franks. It is therefore probable, though Jacob Grimm (*Geschichte der Deutschen Sprache*, p. 518) says that the view has "only a moderate value," that Frank is the newest of all German names, and represents, somewhat vaguely, a group of tribes who dwelt about the lower and middle Rhine. The Frank lived in districts previously occupied by tribes bearing other names; nor have we proof of any incursion of a strange tribe called Franks from north or east. The old Frankish legend that they came from the Danube to the Rhine probably arose from the fact that a colony of the Sicambrian cohort was planted by the Romans on the spot where Buda-Pesth now stands; nor need we seriously consider the usual annalist statement that they were "reliquiæ Troianorum." The meaning and origin of the term also lends itself to the view above stated,—the words "frank and free," usually grouped together, are in fact the same in origin and meaning (*fri*, *frech*, M.H.G.; *frekkar*, Scand.; *friks*, Goth. =*audax*, *avidus;* then by insertion of *n*, cp. *linquo* from root of *liqui*, we get *frank*). The two words thus grouped together form an epithet rather than a proper name; the "free Franks" are those tribes whose freedom suffered most attack; the name probably came into being in the 3d century A.D. as a part of the resistance of northern and north-western Germany to the ceaseless attempts of Rome. "Francus habet nomen a feritate sua," says Ermoldus Nigellus (i. 344); and the word carries the sense of boldness, defiance, freedom. As it did not lend itself well to Latin verse-endings, and as its origin was late, we find the silver and leaden poets delighting to call the Franks Sicambri, as in the famous speech of St. Remi to Hlodowig, "Depone mitis colla, Sicamber," etc.



The Salians and Ripuarians, *cir.* 400.

When their history begins, the Franks are in three groups, mostly on the left bank of the Rhine, from Mainz to the sea. It is, however, quite clear that in earlier days they dwelt also on the right or German bank; for if at first the Romans pressed on them, ere long they began to press on the Romans in return. The oldest Frankish land was then on the Rhine; some of it lay to the north of the Betuwe (the island between Meuse and Rhine), having the river Yssel as its eastern limit, and a line drawn through Durstede, Utrecht, and Muyden as its western boundary. The Franks of this district, afterwards called Salians (a name derived either from Sala, an inheritance, or from the river Saal, or Yssel), filled the parts called the Veluwe and the territory of the Sicambri; south-east of these was a second group, the Chamavi, Bructeri, Attuarii, also at first on the right bank of the Rhine; beyond these, a group of Chatti and Suevi, from a little above Cologne to the Main, filling up all the country between the Taunus hills and the Rhine. It is to this group of tribes, says Watterich (*Germanen des Rheins*, p. 166), that the title Frank was first given. This view of their geographical distribution is supported by the evidence of Peutinger's *Itinerary*, in which Francia stands on the right bank of the Rhine from just above Nimwegen to a little below Coblentz; and though this famous map is a road-chart rather than a record of ethnology and tribal distribution, still it may fairly be urged that its author would not have placed the Franks on the very outside of his map had their home been on the left bank of the Rhine.

In the middle of the 3d century these Franks began to press into the First and Second Germany, two tracts of land on the left bank of the Rhine from Alsace to the sea. In 240 the Chatti crossed at Mainz; in 258 Franks are in the army of Postumus as well as opposed to him; with them he drove their brethren across the Rhine and made Cologne his capital. By degrees they filled the whole district from the Moselle to the Betuwe, occupying the lands of the Ubii and Tungri, that is, from the Ardennes to the Rhine and Meuse. These Franks are known to history as the Ripuarians, receiving, as was not unnatural, a partly Latin name (Ripuarii, Riparii, bank-men; or possibly Rip-wehr-ii, bank-defenders). About the same time the Salian Franks also moved southward, crossing the Rhine, which in those days was slow and shallow in its lower course, the main waters having been diverted into the Meuse. They occupied the whole Betuwe, and spread down to the sea, inhabiting the marshy delta of the rivers ("paludicolæ Sigambri," or "Franci inviis strati paludibus," *circa* 280 A.D.); and presently (287) they took part in naval expeditions down the coast of Gaul. Then, passing the Meuse also, they seized on Toxandria, which was given over to them in 358 by the emperor Julian, who defeated them, and admired their bravery and independent spirit. Henceforth we find plenty of Franks taking service under the empire: Frankish chiefs, like Bald, Mellobald, Arbogast, rise to high places in court and army; their names appear even in the Consular Fasti; they make or unmake emperors. By the end of the 4th century the frontiers of the empire to the north had permanently receded: Andernach was the outmost Rhine station held by the Romans; Tournay was still theirs; they had a fleet on the Sambre; all beyond was Frankish land. Before long the Franks advanced again: in 429 we hear (in Gregory of Tours) that the Salians, coming "from Dispargum (Disiburg, the city of the goddesses), in Toringia," won a great battle at Cambrai under Chlodion their king, and penetrated even as far as the Loire. This Toringia is probably a confusion with Tongria, a little district on the Meuse; the Franks were never in Thuringia. With their two capitals, the Salians at Dispargum, the Ripuarians at Cologne, the Franks now became the bulwark of the Romans: they resisted the barbarians who crossed the Rhine at Mainz in 406; and in 451 again joined the legions to repel at Chalons the hideous invasion of Attila. Thus feeling their strength, it was not long before, under their young king Hlodowig, or Clovis, the Salian Franks became masters of northern Gaul, while their brethren the Ripuarians remained for the time near the Rhine. And "as the son of Childerich, following in the steps of his kinsfolk, pressed southwards, in mid career of victory he met the Christians' God. The Disi, the wild goddesses, abandoned him; he trusted in the god of Hlotehild, and conquered all his foes" (Watterich *Die Germanen des Rheins*, p. 238). These Christianized Salians, under the Merwing house, became in time lords of all Gaul, and gave it a new name, Francia Occidentalis, or Interior, or Latina, to distinguish it from the older Francia Orientalis, the Germany of the middle Rhine; the latter name drifted off towards the east, and has found a home in that central district of Franconia, which lies far away from the true Frankish land.

Henceforth the history of the Franks falls under that of France; while their institutions were mainly those of all Germans. (See FRANCE and GERMANY). Their physical features were also those of the race in general; the fierceness of their looks; the wrinkled scowl about their brows, "torvi Sicambri;" their wild blue eyes; their large limbs, which contrasted with the little stature of the Romans; their long fair hair, which was a choice commodity at Rome, being bought eagerly by the ladies of fashion in those late imperialist days,—all these things had little in them that was specially Frankish. Their weapons were more characteristic, being their own and connected closely with their name. They fought either with the "framea" (a word which is almost certainly a copyist's error for "franca"), which was a light javelin, tipped with iron sharpened on either side, a weapon fit for casting or smiting, and sometimes spoken of as a little axe; or with the francisca, which was a heavy battle-axe. It is to the Franks that the great Siegfried Saga properly belongs; and their early history is hopelessly mixed up with legend. It is not till the days of Hlodowig that any light is thrown on their institutions,—the *Lex Salica*, the law of the Salian Franks, and the *Lex Ripuaria*, of which the origin was a little later, belonging probably to the end of the 5th and the early part of the 6th centuries. The *Lex Salica* was afterwards enlarged and altered; in its earliest form it presents to us the Franks in their Toxandrian or Tongrian time, before Christianity had touched them. This law shows no trace of a feudal nobility or a "feudal system" of any kind; as Waitz (*Deutsche Verfassungsgeschichte: Das alte Recht der Salischen Franken*, p. 103) says, "Das Salische Gesetz kennt keinen Adel; auch nicht die leiseste Spur desselben findet sich." The tribes had chiefs or kings, elected by the whole body of free men from one family (as Hlodowig from among the Merwings); there were also sundry officers of justice and administration, rachimburgs or grafs, but these are no more noble than the rest of the free Franks, who formed a republic of fighting men, each man's voice being as potent in the mall as his arm was in the battle. The "læti," or the "pueri regis," the king's "damsels," and the antrustions belong to the later editions of the law. King, free Frank, and slave of war,—these are the only grades. The code endeavors, always by imposition of carefully graduated fines, to protect the sanctity of the Frank's family, to determine his duties towards the king, the graf, and the tribal council or mall, to provide for the security of his property, whether personal or landed. It is in this last part of the code that we find the famous clause (*Lex Salica*, lix., De Alodis, § 5; Waitz, p. 266) on which the so-called Salic law of France was afterwards based: "De terra vero nulla in muliere hereditas est, sed ad virilem sexum qui fratres fuerint tota terra perteneat." This special limitation as to the inheriting of Salic land (the Stamm-land as the Germans call it, the Odal of the Icelanders) is but a scanty basis on which to build a great law of royal succession, which lasted in France as long as the monarchy continued, and might still reappear, were the present republic to prove untrue to itself. Up to the time of the Revolution, the French noblesse prided themselves on being the "proud descendants of the conquerors;" but though it is possible, in earlier times, to trace or to fancy distinctions of feature and character, marking off the noble from the *roturier* or the peasant, still in the later days of the monarchy "the noble race of conquerors" was so much changed, so many old houses had become extinct, so many had been diluted with foreign blood, so many new patents of nobility had been issued, that it would require no small ingenuity and imagination to see in the courtiers of Louis XVI. the representatives of the Franks of Hlodowig or Charles the Great.

The chief authorities for the Franks are Jakob Grimm, *Geschichte der deutschen Sprache*, Leip., 1848; Waitz, *Das alte Recht der Salischen Franken: Beilage zur deutschen Verfassungsgeschichte*, Kiel, 1846; Gohm, *Fränkische Reichs- und Gerichts-Verfassung*, Weimar, 1871; Watterich, *Die Germanen des Rheins*, Leip., 1872. There is also an ingenious lecture by Giesebrecht. In modern days not much has been written on the Franks, except in connection with the history of institutions. (G. W. K.)

FRANZÉN, FRANS MICHAEL (1772–1847), Swedish poet, was born at Uleåborg in Finland, 9th February, 1772. At thirteen he entered the university of Åbo, where he graduated in 1789, and became "eloquentiæ docens" in 1792. Three years later he started on a tour through Denmark, Germany, France, and England, returning in 1796 to accept the office of university librarian at Åbo. In 1801 he became professor of history and ethics, and in 1808 was elected a member of the Swedish Academy. On the cession of Finland to Russia Franzén removed to Sweden, where he was successively appointed parish priest of Kumla in the diocese of Strengnäs (1810); minister of the Clara Church in Stockholm (1824), and bishop of Hernösand (1831). He died at Säbrå parsonage, 14th August, 1847. From the autumn of 1793, when his *Till en ung Flicka* and *Menniskans anlete* were inserted by Kellgren in the *Stockholmspost*, Franzén grew in popular favor by means of many minor poems of singular simplicity and truth, as *Till Selma*, *Den gamle knekten*, *Riddar St. Göran*, *De Små*, *Blommorna*, *Modren vid vaggan*, *Nyårsmorgonen*, and *Stjernhimmelen*. His songs *Goda gosse glaset töm*, *Sörj ei den gryende dagen förut*, *Champagnevinet*, and *Bevaringssång* were widely sung, and in 1797 he won the prize of the Swedish Academy by his *Sång öfver grefve Filip Creutz*. This noble lyric is the turning-point of Franzén's poetic life. Henceforth his muse, touched with the academic spirit, grew more reflective and didactic. His longer works, as *Emili eller en afton i Lappland*, and the epics *Sven Sture eller mötet vid Alvastra*, *Kolumbus eller Amerikas upptäckt*, and *Gustaf Adolf i Tyskland* (the last two incomplete), though rich in beauties of detail, are far inferior to his shorter pieces. Franzén was a true lyric poet, fixing with masterly art the fleeting traits of common life in a glorified and fascinating form. At a time when revolution shrieked against every traditional bond of society, the lyre of Franzén breathed innocence and peace. With gentle earnestness and naïveté he sang the sweetness of love and family life—his highest human type the prattling child, the flowery meadows his elysium. His innocence is his peculiar charm; "his very *espièglerie*," says Malmström, "is but the laugh of children's lips."

The poetical works of Franzén are collected under the title *Skaldestycken* (7 vols., 1824–61; new ed., *Samlade dikter*, with a biography by A. A. Grafström, 1867–69). A selection is published in 2 vols. (1871). His prose writings, *Om svenska drottningar* (1823), *Skrifter i obunden stil* (vol. i., 1835), *Predikningar* (5 vols., 1841–45), and *Minnesteckningar*, prepared for the Academy (3 vols., 1848–60), are marked by faithful portraiture and purity of style. See Malmström, *Inträdestal i Svenska Akademien* (1850); Hollander, *Minne af F. M. Franzén* (1868); Cygnæus, *Teckningar ur F. M. Franzéns lefnad* (1872); and Gustaf Ljunggren, *Svenska vitterhetens häfder efter Gustaf III.'s död*, vol. ii. (1876).

FRANZENSBAD, KAISER-FRANZENSBAD, EGERBRUNNEN, and formerly SCHLADAER SÄURLING a well-known Bohemian watering-place which owes its most popular name to the emperor Francis II. It is a little over three miles N. W. of Eger, at the height of about 1500 feet above the sea, in the neighborhood of the Fichtelgebirge, the Böhmerwald, and the Erzgebirge. There are altogether eight mineral springs, of which the first known was the Franzensquelle or Francis's fountain. The Poltersbrunnen gives off carbonic acid gas, which is utilized for medical purposes in a building erected in 1826. Besides the great *cursaal* or pump-room, the village contains several bathing establishments, one of which belongs to the town of Eger. In the park, which is also the property of the Eger municipality, there is a bronze statue of Francis I. by Schwanthaler. The mineral waters are saline and alkaline, and act as mild aperients and tonics. They have a great reputation, and have given rise to a considerable literature. See the works of Cartellieri (1869), Hamburger (1873), and Klein (1874).

FRASCATI, a town of Italy, in the province of Rome and about 10½ miles south of the city, with a station at the terminus of a branch railway from the main line between Rome and Naples. It is the seat of a bishop, and a favorite summer residence of the Roman nobility. Among the public buildings are the old cathedral of S. Rocco, dating from the beginning of the 14th century; the new cathedral of San Pietro, founded about 1700 by Innocent XII.; the church of Santa Maria, of the 9th century; and seven old conventual establishments. But the interest of the place is due rather to its palatial villas. The villa Aldobrandini takes its name from Cardinal Pietro Aldobrandini, was designed by Della Porta, contains frescoes by Arpino, and now belongs to the Borghese family. The villa Ruffinella or Tusculana dates from the 16th century, was for some time in the possession of Lucien Bonaparte, and afterwards passed into the hands of King Victor Emmanuel. In the chapel are the tombs of Lucien Bonaparte, his wife, his father, and his son Joseph. The villa Mondragone, the largest of all, was erected by Cardinal Altemps in the 16th century, now belongs to the Borghese family, and is partly occupied by a Jesuit school. The villa Conti, formerly known as the Ludovisi, is the property of the Torlonia family. The villa Falconieri, having been founded in 1550 by Cardinal Ruffini, ranks as the oldest in Frascati; and the villa Piccolomini is interesting as the place where Baronius composed part of his *Annals*. About 3 miles from Frascati is the Greek monastery of Grotta Ferrata, interesting mainly for the frescoes of Domenichino in the chapel of St. Nilus, the best of the Greek manuscripts formerly contained in its library having been removed to Rome. The extensive gardening operations of the people of Frascati have rendered the name "Frascatese" almost equivalent to garden-girl. In 1871 the population was 7045. For Roman remains and history see Tusculum.

FRASER, James Baillie (1783–1856), Scottish diplomatist, traveller, and author, was born at Reelick or Relig in the county of Inverness, in June, 1783. He was the eldest of the four sons of Edward S. Fraser of Reelick, all of whom found their way to the East, and gave proof of their ability. When Reza Kooleé Murza and Nejeff Kooleé Murza, the exiled Persian princes, visited England, he was appointed to be their *mehmindar*, and on their return he accompanied them as far as Constantinople. He was afterwards sent to Persia on a diplomatic mission by Lord Glenelg, and effected a most remarkable journey on horseback through Asia Minor to Teheran. His health, however, was impaired by the fatigue and exposure; and he consequently retired to his estate in Scotland. In 1823 he married a daughter of Lord Woodhouselee, and sister of Patrick Fraser Tytler. He died at Reelick in January, 1856. Fraser is said to have displayed great skill in water-colors, and several of his drawings have been engraved; and the astronomical observations which he took during some of his journeys did considerable service to the cartography of Asia. The works by which he attained his literary reputation were accounts of his travels and fictitious tales illustrative of Eastern life. In both he employed a vigorous and impassioned style, which was on the whole wonderfully effective in spite of minor faults in taste and flaws in structure. Some of his tales have not yet altogether lost their popularity.

In 1820 there appeared a *Journal of a Tour through part of the Snowy Range of the Himala Mountains*; in 1825, a *Narrative of a Journey into Khorasan in the years 1821 and 1822, including an Account of the Countries to the North-East of Persia*; and in 1826, *Travels and Adventures in the Persian Provinces on the Southern Banks of the Caspian Sea*. The first part of *The Kuzzilbash, a Tale of Khorasan*, was published in 1828, and the second part or continuation in 1830, under the title of the *Persian Adventurer*. These were followed in 1833 by *The Khan's Tale*, of which the scene is laid in Khorasan. In 1834 appeared a *History of Persia* (in the Edinburgh Cabinet Library), and in 1838 a *Narrative of the Residence of the Persian Princes in London, 1835–6*, and *A Winter Journey (Tâtar) from Constantinople to Teheran, with Travels through various parts of Persia*. Next came *Travels in Koordistan and Mesopotamia*, 1840; *The Highland Smugglers*, 1842; *Allee Neemroo*, 1842; *The Dark Falcon, a Tale of the Attruck*, 1844; *Mesopotamia and Assyria* (Edinburgh Cab. Lib.), 1847; *Military Memoirs of Lieut.-Col. Skinner*, 1851.

FRASER, Simon. See Lovat.

FRASERBURGH, a seaport town of Scotland, Aberdeenshire, on the south side of Kinnaird's Head, 42 miles north of Aberdeen. It is built nearly in the form of a square, and most of the streets cross each other at right angles. The cross is a fine structure of an hexagonal form, covering an area of 500 feet, and surmounted by a stone pillar 12 feet high, ornamented by the British arms and the arms of Fraser of Philorth. Fraserburgh is one of the chief stations of the herring fishing in Scotland, the number of herring boats engaged by the curers of the port averaging about 900. During the herring season the increase to the population of the town is upwards of 10,000. In 1877 the number of barrels of herrings cured in Fraserburgh was 180,000, and the value of the herring landed was about £280,000. The harbor, originally constructed as a refuge for British ships of war, is one of the best on the east coast of Scotland, and has lately been improved by the widening of the piers and the extension of the breakwaters. The total sum expended on the harbor from 1857 to 1877 was £87,485. It has an area of upwards of six acres, is easy of access, and affords anchorage for vessels of every size. Still further improvements are proceeding, which, when completed, will afford outside the harbor an area of 8 acres of sheltered water, with a depth of from one to two fathoms at low tide. The population of Fraserburgh in 1871 was 4268.

Fraserburgh takes its name from Sir Alex. Fraser of Philorth, who in 1613 obtained for it a charter as a burgh of regality, and whose representative, Lord Saltoun, is now superior of the town. The same Sir A. Fraser obtained in 1592 a charter for the institution and endowment of a college and university here; and at the west end of the town is a quadrangular tower of three stories which formed part of the building designed for this seminary. The intention was subsequently abandoned, probably from want of funds.

FRATRICELLI was a common name given to a number of obscure mediæval sects who flourished in the 13th and 14th centuries. They were also called Bioschi, Bighini, Bocasoti, Frérots, etc., and included such sects as the Brethren of the Full Spirit, the Brethren of the Free Spirit, the Beghards, the Brethren of the Common Life, etc. The history of these mediæval sects is very obscure; but it seems now made out that while they had some relation to and sympathy with the older Cathari and other Manichæan heretics, they had a distinct origin in the Franciscan order, and that their real aim was to carry out the principles of St. Francis even in defiance of the court of Rome. Their origin has been traced to Peter of Macerata and Peter of Fossombrone, who put themselves at the head of certain malcontent Franciscans, who, having been condemned by Pope Celestine in 1294, declared that the rule of Francis was of more authority than any pope, and that papal opposition only showed that the pope himself might become anti-Christian. They soon began to teach opposition to the pope, the clergy, and the church. They held millenarian views, and preached and practised communism after the fashion, they said, of the early Christians. Their opinion soon spread among the Franciscan Tertiaries, and the common people everywhere favored them. Boniface VIII. ordered the Inquisition to look after them, and on a report of Matthew of Chieti they were condemned in 1297 and handed over to the Inquisition. This only roused opposition. They held a general meeting in Rome, elected a pope of their own, organized themselves, spread over Europe, and by preaching missions made converts everywhere. Their ranks were continually recruited from the malcontent friars, especially from the Franciscans. Pope John XXII. condemned them under the names of Fratricelli, Fratres de pauperi vita, Bizochi, and Bighini, and issued briefs against them in 1322 and 1331. They gave great trouble to the church in Strasburg, Cologne, and the Rhineland. In Italy their headquarters were in the Mark of Ancona and in Turin, where persecutions were organized against them in 1335, 1368, 1373–88. Popes Martin V., Eugenius IV., and Nicholas V. also persecuted them. In spite of all they survived until the Reformation. Their smouldering fire probably burnt itself out in the Anabaptist movement of the 16th century.

The best collective accounts are to be found in Mosheim, *De Beguinis et Beguinabus*, and Hahn's *Gesch. der Ketzer im Mittelalter*, vol. ii. bk. iv.

FRAUD, in law, is a word of wide import, to which it is difficult to assign any exact definition. The courts have in fact deliberately refrained from defining it, because they did not wish to limit their power of dealing with fraudulent transactions. The word, however, carries its own meaning on the face of it, and there is practically no difference between fraud in the popular and fraud in the legal sense. Any course of conduct that would generally be described as dishonest, any cheating or deceiving another so that he would be injured thereby, would be fraud in law as in common parlance. In some writers, indeed, there is found an attempted distinction between *legal* and *moral* fraud. The acts of a vendor who puffs the goods he sells are, it is said, in so far as they conceal the truth or produce a false impression in the mind of the buyer, fraudulent from an ethical point of view. The law, however, regards them not, holding that the buyer must look to his bargain for himself. *Caveat emptor*; if he chooses to believe the assertions of the puffer when he might verify the facts for himself, so much the worse for him. An examination of the case, however, shows that there is little or no value in the alleged distinction. The meaning of the maxim is that when the parties are dealing at arm's length, neither is in fact *deceived* by the exaggerations or depreciations of the other. If actual and intentional misrepresentation is proved the law will avoid the contract, but it will not readily listen to the claim of a man who, having the opportunity of examining what he bought, protests that he purchased on the strength of the vendor's recommendations.

The essential element in fraud is misrepresentation,—producing a false impression on the mind of another—causing him to believe that which is not true. And misrepresentation, to amount to fraud, must also be intentional. There is a wide difference between a false statement believed to be true by the person who makes it and a false statement known to be false by the person who makes it The latter is clearly fraudulent, and although it would not be safe to set this down as a sufficient definition of fraud, something of this sort will be found to exist in all conduct which is recognized as legally or morally fraudulent. The innocent misrepresentation of facts is, both in law and in common morality, a much less serious thing than wilful misrepresentation. The latter would include not merely the cases where the statement is known to be false by the person making it, but also the cases in which the statement is made recklessly without any belief one way or the other. He who deliberately makes a statement which he does not know or believe to be true does so at his peril, and if it turns out to be false he will find himself in the same position as if he had known it to be false from the beginning.

It is in reference to contracts that the legal treatment of fraud is of the greatest importance. The broad rule is that any contract tainted by fraud is void at the option of the party injured. Innocent misrepresentation in the sense above defined has no such effect on a contract, has in general no effect at all unless in certain exceptional cases. Thus if the representation is a *condition*, the contract is avoided if it turn out not to be true. Or if it is a *warranty*, its falsehood will give a right of action for the breach thereof. And so in certain other cases. But wilful misrepresentation or fraud taints the whole contract. Suppose a contract for the sale of goods between A and B. A, the vendor, makes statements relating to the contract which are not true. If the truth of the statements was made a condition of the contract, or if A warranted their truth, he would be responsible to B whether he in point of fact believed the statements to be true or not. In other cases he would be responsible if he knew the statements to be false or made them recklessly without any belief as to their truth or falsehood.

Statements, misrepresentations, or frauds, to be within the rule, must be such as are material to or such as have given rise to the contract. There must be *dolus dans locum contractui*. A fraudulent concealment or misrepresentation, which had no effect on the mind of the innocent party because the circumstances for which it was prepared did not arise, has no effect on the contract. And the fraud must be the fraud of one of the contracting parties or his agents. False or fraudulent statements, through which A is induced to enter into contract with B, have no effect on the contract if B was in no way privy to them. So also it has been held that the fraud must relate to the same transaction, *e.g.*, a fraudulent misrepresentation made on a former occasion by one of the contracting parties has no effect on the contract, although in point of fact it was that which induced the other party to contract.

A contract vitiated by fraud is void at the option of the party injured. He may rescind the agreement if he chooses, or he may affirm it and require the other party to place him in the same position as if the false statement had in point of fact been true. This option he must exercise within a reasonable time after discovering the misrepresentation.

Apart from contract, fraud or misrepresentation may give a right of action to the party injured thereby. A typical case is where A is induced by the false representation of B to give credit to C. A has a right of action against B for any damage he may have sustained in consequence.

It may be expedient here to notice the *Statute of Frauds* (29 Charles II., c. 3)—perhaps the most important piece of legislation in the whole statute-book. Its object is stated to be the "prevention of frauds and perjuries," and its effect is to make writing essential to the validity of many transactions. The most important sections are those relating to contracts, viz., the 4th and the 17th, almost every word of which has been the subject of numerous decisions. By the 4th section *no action shall be brought* on the contracts therein mentioned unless the agreement, or some note or memorandum thereof, shall be in writing and signed by the party to be charged therewith, or some other person thereunto by him lawfully authorized. The contracts referred to are the following:—(1) any special promise by an executor or administrator to answer damages out of his own estate; (2) any special promise to answer for the debt, default, or miscarriage of another person; (3) any agreement made upon consideration of marriage; (4) any contract or sale of lands, tenements, or hereditaments, or any interest in or concerning them; and (5) any agreement that is not to be performed within the space of one year from the making thereof. It will be noticed that this section does not make the contract null and void, but only unactionable. The 17th section refers to sales of goods for the price (or value) of £10 and upwards, which are "not allowed to be good" unless some memorandum of the bargain has been made in writing (see CONTRACT). Arrangements by which an insolvent debtor agrees to give to one of his creditors a preference over the others without their knowledge or consent, are known as *fraudulent preferences*, and are null and void.

Fraud can hardly be said to be under that name an offence known to the criminal law; the vagueness of the conception renders it impossible to treat fraud *per se* as a crime. But there are specific offences (both at common law and by statute) of which fraud is the gist, and in dealing with these the courts have had some little difficulty in drawing the line between criminal and non-criminal fraud. At common law it would appear that only those cheats or frauds are indictable which amount to "fraudulently obtaining the property of another by any deceitful and illegal practice or token (short of felony) *which affects or may affect the public*" (Russell *On Crimes*, vol. ii.). Chief Justice Cockburn in one case stated, as the result of the authorities, that "if a person in the course of his trade, *openly and publicly carried on*, were to put a false mark upon an article so as to pass it off as a genuine one, when in fact it was only a spurious one, and the article was sold and money obtained by means of that false mark or token, that would be a cheat at common law." On the other hand, cheats by means of a bare lie or false affirmation in a private transaction are not indictable at common law; *e.g.*, when a merchant falsely pretended that a certain parcel of gum was gum seneca, whereas it was an inferior and less valuable gum, the fraud was held not indictable. And in another case where the defendant was charged with obtaining money from another by a falsehood, Chief Justice Holt said, "Shall we indict one man for making a fool of another? Let him bring his action." Frauds affecting the crown would be indictable, and so would any cheat aimed at the general public, *e.g.*, when an impostor maims himself to have a pretence for asking charity. Russell considers that the publication of false news likely to produce any *public detriment* would be criminal.

The principal criminal enactment against frauds is 24 and 25 Vict., c. 96, §§ 75–90. By § 88, "whoever shall by any false pretence obtain from any other person any chattel, money, or valuable security, with intent to defraud, shall be guilty of a misdemeanor." Other sections deal with frauds by agents, bankers, or factors, by trustees, by directors of companies (keeping fraudulent accounts, publishing false statements, etc.). Other enactments are the statutes of Elizabeth against fraudulent conveyances (13 Eliz., c. 5, and 27 Eliz., c. 4); 9 Geo. II., c. 5 (persons pretending to exercise witchcraft, tell fortunes, etc.); 25 and 26 Vict., c. 88 (forgery, trade marks, etc.); the Debtors Act, 1869 (fraudulent debtors, etc.).

The distinction between private and public frauds does not hold in the law of Scotland. Thus if a person undertake to supply an article according to sample, or an article which has been inspected and ordered, and intentionally send a substance which is not the thing contracted for at all, or which, though containing some proportion of the article ordered, is an adulterated mixture, he is guilty of falsehood, fraud, and wilful imposition (Macdonald's *Criminal Law of Scotland*). This passage may be compared with the private frauds cited above. (E. R.)

FRAUENBURG, a town of Prussia, province of East Prussia, government district of Königsberg, is situated on the Frische Haff, and at the mouth of the Baude, 41 miles S.W. of Königsberg. It is the seat of the Roman Catholic bishop of Ermeland. The cathedral, which stands on an eminence, possesses six towers, and forms a kind of fortress. The astronomer Copernicus was canon at Frauenburg, and there is a monument to him in the cathedral. He is said to have constructed the tower containing machinery for supplying the town and neighborhood with water. The tower is no longer used for this purpose. The population of Frauenburg is about 2500.

FRAUENFELD, a town of Switzerland, capital of the canton of Thurgau (or Thurgovia), is situated in a beautiful and fertile district on the Murg, 23 miles N.E. of Zurich. It is the artillery dépôt for east Switzerland, and possesses an old castle with a tower belonging to the 10th century, an old Capuchin monastery, a townhouse, an armory, and a canton school. The chief industries are spinning and the manufacture of cotton cloth, but many of the inhabitants are engaged in agriculture. After the extinction of the countship of Alt-Frauenfeld, the town came into the possession of the counts of Kyburg, and subsequently into that of Austria. In 1799 a battle was fought there between the French and Austrians. The population in 1870, including the adjoining villages of Kurzdorf and Langdorf, was 4261.

FRAUENLOB, the name by which a German poet of the 13th century is almost exclusively known, though his real name was Heinrich von Meissen. How he acquired the sobriquet has not been decided,—whether it was from his song in honor of the Virgin (*Die Heilige Jungfrau*), or because in another of his pieces he defended the use of the word *Frau* instead of *Wieb*, or simply because he sang much in praise of women. The last explanation is the one that has received the stamp of popular acceptance. Frauenlob was born in 1260 of a humble burgher family. His youth was spent in straitened circumstances, but he gradually acquired reputation as a singer at the various courts of the German princes. In 1278 we find him with Rudolph I. in the Marchfeld, in 1286 he was at Prague at the knighting of Wenceslaus II., and in 1311 he was present at a knightly festival celebrated by Waldemar of Brandenburg before Rostock. After this he settled in Mainz, and there, according to the popular account, founded the first school of Meister-singers. He died in 1318, and was buried in the cloisters of the cathedral at Mainz. His grave is still marked by a copy made in 1783 of the original tombstone of 1318; and in 1842 a monument by Schwanthaler was erected by the ladies of the city in another part of the cloisters. Frauenlob's poems make a great display of learning, and their versification abounds in tricks of rhyme. Ettmüller published a very full edition in 1843.

See Von der Hagen's *Minnesinger*, vol. iv.; Bartsch, *Meisterlieder der Kolmarer Handschrift;* and Schröer in Bartsch's *Germanist. Studien.* An English translation of Frauenlob's *Cantica Canticorum* by A. E. Kroeger appeared in 1877 at St. Louis, United States.

FRAUNHOFER, JOSEPH VON (1787–1826), a celebrated optician, was born at Straubing in Bavaria, March 6, 1787. His father, a poor glazier, having died in 1798, young Fraunhofer in August of the following year was apprenticed to Weichselberger, a glass-polisher and looking-glass maker. Having by day no time that he could call his own, he studied the few old books that he possessed during leisure snatched from sleep. On the 21st of July, 1801, he nearly lost his life by the fall of the house in which he lodged, and the elector of Bavaria, Maximilian Joseph, who was present at his extrication from the ruins, gave him 18 ducats. With a portion of this sum he obtained release from the last six months of his apprenticeship, and with the rest he purchased a glass-polishing machine. He now employed himself in making optical glasses, and in engraving on metal, devoting his spare time to the perusal of works on mathematics and optics. In 1806 he obtained the place of optician in the mathematical institute which in 1804 had been founded at Munich by Joseph von Utzschneider, G. Reichenbach, and J. Liebherr; and in 1807 arrangements were made by Utzschneider for his instruction by Pierre Louis Guinand, a skilled optician, in the fabrication of flint and crown glass, in which he soon became an adept (see R. Wolf, *Gesch. der Wissench. in Deutschl.*, bd. xvi. p. 586). With Reichenbach and Utzschneider, Fraunhofer established in 1809 an optical institute at Benedictbeuern, near Munich, of which he in 1818 became sole manager. The institute was in 1819 removed to Munich, and on Fraunhofer's death came under the direction of G. Merz. Amongst the earliest mechanical contrivances of Fraunhofer was a machine for polishing mathematically uniform spherical surfaces. He was the inventor of the stage-micrometer, and of a form of heliometer; and in 1816 he succeeded in constructing for the microscope achromatic glasses of long focus, consisting of a single lens, the constituent glasses of which were in juxtaposition, but not cemented together. The great reflecting telescope at Dorpat was manufactured by Fraunhofer, and so great was the skill he attained in the making of lenses for achromatic telescopes that, in a letter to Sir David Brewster, he expressed his willingness to furnish an achromatic glass of 18 inches diameter. For his researches, published in the *Denkschriften der Münchener Akadamie* for 1814–15, by which he laid the foundation of solar and stellar chemistry, Fraunhofer is especially known. The dark lines of the spectrum of sunlight, earliest noted by Dr. Wollaston (*Phil. Trans.*, 1802, p. 378) were independently discovered, and, by means of the telescope of a theodolite, between which and a distant slit admitting the light a prism was interposed, were for the first time carefully observed by Fraunhofer, and have on that account been designated "Fraunhofer's lines." He constructed a map of as many as 576 of these lines, the principal of which he denoted by the letters of the alphabet from A to G; and by ascertaining their refractive indices he determined that their relative positions are constant, whether in spectra produced by the direct rays of the sun, or by the reflected light of the moon and planets. The spectra of the stars he obtained by using, outside the object-glass of his telescope, a large prism, through which the light passed to be brought to a focus in front of the eye-piece. He showed that in the spectra of the fixed stars many of the dark lines were different from those of the solar spectrum, whilst other well-known solar lines were wanting; and he hence concluded that it was not by any action of the terrestrial atmosphere upon the light passing through it that the lines were produced. He further expressed his belief that the dark lines D of the solar spectrum coincide with the bright lines of the sodium flame, a fact subsequently established by Brewster, Foucault, and Miller, and successfully accounted for by Kirchhoff. Fraunhofer was a member of the Academy of Sciences at Munich, and of the university of Erlangen. In 1823 he was appointed conservator of the Physical Cabinet at Munich, and in the following year he received from the king of Bavaria the civil order of merit. He died at Munich, June 7, 1826, and was buried near Reichenbach, whose decease had taken place eight years previously. On his tomb is the inscription "Approximavit sidera." His scientific papers were published in the *Denkschriften der Münchener Akadamie*, Gilbert's *Annalen der Physik*, and Schumaker's *Astronomische Nachrichten.*

See OPTICS; J. von Utzschneider, *Kurzer Umriss der Lebensgeschichte des Herrn Dr. J. von Fraunhofer*, Munich, 1826; and Merz, *Das Leben und Wirken Fraunhofers*, Landshut, 1865.

FRAUSTADT, a garrison town, and the chief town of a circle in the government district of Posen, Prussia, is situated in a flat sandy country 50 miles S.S.W. of Posen. It has an orphanage, a reformatory, a royal real-school of the first class, a higher ladies' school, and an agricultural school. Its manufactures include woollen and cotton goods, hats, morocco leather, and gloves, and it has a considerable trade in corn, cattle, and wool. Fraustadt was founded by the Dutch, and until 1343 belonged to the principality of Glogau. Near the town the Swedish general Reenskiöld defeated the Saxons on the 13th of February, 1706. The population in 1875 was 6435.

FRAYSSINOUS, DENIS ANTOINE LUC, COMTE DE (1765–1841), a Gallician prelate and Bourbonist minister, distinguished as an orator and as a controversial writer, was born of humble parentage at Curières, in the department of Aveyron, on the 9th of May, 1765. After a course of training, first at the diocesan seminary of Rodez and afterwards in Paris under the priests of Saint Sulpice, he was ordained priest in 1789. In 1801 he began to give private lectures on dogmatic theology in the Faubourg Saint Jacques, and at the same time to deliver, in the church of the Carmelites, a series of "catechetical lectures," which afterwards developed into the "conferences" of Saint Sulpice, to which admiring crowds were attracted by his lucid exposition and by his graceful and glowing oratory. The freedom of his language in 1809, when Napoleon had arrested the pope and declared the annexation of Rome to France, led to a prohibition of his lectures; and the dispersion of the congregation of Saint Sulpice in 1811 was followed by his temporary retirement from the capital. He returned with the Bourbons, and resumed his conferences, in 1814; but the events of the Hundred Days again compelled him to withdraw into private life, from which he did not emerge until February, 1816. As court preacher and almoner to Louis XVIII., he now entered upon the period of his greatest public activity and influence. His *Panégyrique de Saint Louis*, his *Oraison Funèbre du Prince de Condé*, and other orations are said to have profoundly impressed the public mind, and their effect was still further deepened by the publication of his *Essai sur l'Indifference en Matière Religieuse* (1818). In connection with the controversy which had been raised by the signing of the reactionary concordat of 1817, he published, also in 1818 a treatise entitled *Vrais Principes de l'Église Gallicane sur la Puissance Ecclésiastique*, which though unfavorably criticised by the Ultramontane Lamennais, was received with favor by the civil and ecclesiastical authorities. The consecration of Frayssinous as bishop of Hermopolis "in partibus," his election to the French Academy, and his appointment to the grand-mastership of the university, followed in rapid succession. In 1824, on the accession of Charles X., he became minister of public instruction and of ecclesiastical affairs under the administration of Villèle; and about the same time he was created a peer of France with the title of count. His term of office was chiefly marked by the recall of the Jesuits. In 1825 he published his conferences under the title *Défense du Christianisme*. The work passed through 15 editions within 18 years, and was translated into several European languages. In 1828 he, along with his colleagues in the Villèle ministry, was compelled to resign office, and the subsequent revolution of July, 1830, led to his retirement to Rome. Shortly afterwards he became tutor to the duke of Bordeaux at Prague, where he continued to live until 1838. The remaining years of his life were passed in great privacy on his native soil. He died at St. Géniez on the 12th of December, 1841. His biography by Henrion was published in 1842, and a posthumous volume, containing some of his earlier "conferences," appeared in 1843 (*Conférences et Discours Inédits*).

FREDERICIA, or FRIDERICIA, a fortified town of Denmark, near the south-east corner of Jutland, on the shores of the Little Belt opposite the island of Funen, about 15 miles S. of Veile. It has railway communication with both south and north, and steamboats ply regularly across the Belt. It is well built, and possesses a handsome town-hall, four churches, and a synagogue. There is a considerable shipping trade, and the industries comprise the manufacture of tobacco, salt, and chicory, and of cotton goods and hats. The population in 1870 was 7186. A small fort was erected on the site of Fredericia by Christian IV. of Denmark, and his successor, Frederick III., determined about 1650 to make it a powerful fortress. Free exercise of religion was offered to all who should settle in the new town, which at first bore the name of Frederiksodde, and only received its present designation in 1664. In 1657 it was taken by storm by the Swedish general Wrangel, and in 1659, after the fortress had been dismantled, it was occupied by Frederick William of Brandenburg. It was not till 1709–10 that the works were again put in a state of defence, and the place even then continued to be of but little importance. In 1848 an attempt was made by the Danes to oppose the Prussians, who entered on May 3, and maintained their position against the Danish cannon-boats. During the armistice of 1848–9 the fortress was strengthened, and soon afterwards it stood a siege of two months, which was brought to a glorious close by a successful sortie. In memory of the victory several monuments have been erected in the town and its vicinity, of which the most noticeable are the bronze statue of the Danish Land Soldier by Bissen (one of Thorwaldsen's best pupils), and the great barrow over 500 Danes in the cemetery of the Holy Trinity Church, with a bas-relief by the same sculptor. On the outbreak of the war of 1864, the fortress was again strengthened by new works and an entrenched camp; but the Danes suddenly evacuated it on 28th April after a siege of six weeks. The Austro-Prussian army partly destroyed the fortifications, and kept possession of the town till the conclusion of peace.

FREDERICK, in German FRIEDRICH, the name, signifying Rich in Peace, borne by a considerable number of European (principally German) sovereigns. The most important of these, including the compound names Frederick Augustus and Frederick William, are noticed here in the following order:—the emperors, the electors of Brandenburg and kings of Prussia, the electors and kings of Saxony, and the electors palatine.

FREDERICK I. (1123–1190), surnamed by the Italians Barbarossa, Holy Roman emperor, and one of the greatest of German sovereigns, was the son of Frederick the One-eyed of Hohenstaufen, duke of Swabia, and of Judith, daughter of Henry the Black, duke of Bavaria, and was born most probably in 1123. He succeeded his father as duke of Swabia in 1147, and in the same year accompanied his uncle Conrad III. on his disastrous crusade. As in addition to his exceptional personal qualities Frederick possessed the advantage of uniting in himself the blood of the two great rival families, the Guelphine and the Ghibelline, Conrad III., though possessing an infant son, nominated him as his successor. On the death of Conrad this choice was unanimously ratified by the assembly at Frankfort, March 4 or 5, 1152, and on the 9th of the same month Frederick received the crown of Germany at Aix-la-Chapelle. During the reign of Conrad, the Italian and imperial rights claimed by the German kings had been almost in abeyance, and it was to establish their reality that Frederick devoted the chief energies of his life. After settling various disputes among the German princes, and making arrangements for an alliance with Manuel emperor of the East against King William of Sicily, he, in October, 1154, descended with his army through the vale of Trent to hold the diet of his imperial feudatories on the plains of Roncaglia. Before this diet the Milanese had treated with contempt his messenger sent to warn them against continuing to oppress the citizens of Lodi; and when he witnessed afterwards, on his march to Piedmont, the desolation that had been caused by the Milanese, he began to sack and burn their dependencies, and after crossing the Po razed Tortona to the ground. Then having appeared, with the iron crown on his head, in the church of St. Michael's, Pavia, he set out over the Apennines to receive the imperial crown at Rome. After apprehending Arnold of Brescia as an earnest of his intentions to support the papal cause, and adjusting certain ceremonial differences with the pope, he was crowned emperor June 18, 1155; but immediately after quelling the insurrection in Rome which followed his coronation, he was compelled, by the sudden appearance of a pestilence in his army, to march towards Lombardy, and without accomplishing more than the capture of Spoleto he disbanded his troops and returned home.

For the next three years a great variety of matters detained him in Germany. Immediately on his return from Italy he put vigorous measures into execution against the robber knights; and in September, 1156, he reconciled Henry the Lion by the restoration of the duchy of Bavaria, while at the same time he pacified Henry *Jasomirgott*, his rival, by raising Austria to the rank of a duchy. Adelaide, whom he married in 1147, he had divorced in 1153 on the pretext of kinship; and, having in 1156 married Beatrice, daughter of the count of Burgundy, he received at Besançon in 1157 the homage of the Burgundian nobles. In the same year he was successful in compelling King Boleslaus of Poland to acknowledge him as his feudal lord, obtained by persuasion the same allegiance from King Geisa of Hungary, and rewarded Duke Ladislaus of Bohemia for his faithful services by giving him the rank of a king. About this time he published a manifesto against the pretensions of the pope to confer *beneficia* upon him; and when Frederick in the beginning of 1158 was preparing for a second campaign in Italy, the pope sent an embassy to explain that he did not use the word in its feudal sense.

Frederick's chief purpose in this expedition was to quell the pride of Milan. Descending into Italy by four different roads, with an army of 100,000 foot and 15,000 horse, he in 1158 laid siege to the city, which, after defying for a month his persistent and furious attacks, was compelled from scarcity of provisions to surrender, and with humiliating forms to take the oath of allegiance. He then held another diet at Roncaglia, at which, besides settling a number of standing disputes, he recovered the right of instituting *podestas* to administer justice in the cities, assumed the nomination of the consuls, and deprived the cities and barons of the right of going to war. The adoption of these regulations—which if within the legal prerogatives of the emperor had nevertheless fallen into abeyance, and were utterly opposed to the strong spirit of independence struggling into existence in the cities—may be said to mark the first stage of his waning influence in Italy. And a second stage was reached when, on the death of Pope Adrian IV. in 1159, he determined to support the anti-pope Victor IV.; for from that time he had to contend with the ceaseless opposition and intrigues of Pope Alexander III., who fulminated against him a sentence of excommunication, March 24, 1160. It is true that Frederick in 1162 was able to spread terror throughout Lombardy by the capture and demolition of Milan; but in 1164 the cities of Verona, Vicenza, Padua, Treviso, and Venice formed a defensive league, and expelled the *podestas* and other foreign oppressors from their territories. In 1163 Frederick had punished the rebellion of Mainz against its archbishop by razing its walls and filling up its trenches; but having, on the death of Victor IV., promoted the election of the new anti-pope Pascal III., he was detained by fresh religious and political contentions in Germany till the end of 1166. Disregarding the embers of conflagration in the north of Italy, he now pushed on towards Rome, to which Alexander had returned the previous year. Doubtful as to the propriety of at once attacking the city, he laid siege to Ancona; but when he learned that the Roman citizens had rashly allowed themselves to be defeated at Tusculum, he raised the siege, and going to Rome took forcible possession of part of the Leonine city, and attacked and captured the Vatican. On the following Sunday (August 1, 1167,) the empress received in St. Peter's the imperial diadem from Pascal III., and Frederick the circlet of gold which was the sign of patrician dignity. Meanwhile behind him the cities of Lombardy had formed their famous league; even Lodi was forced to yield its assent to the alliance; and Milan springing into existence almost as by the wand of an enchanter, gave evidence of its defiant and unquenchable hostility by the demolition of the castle of Trezzo, which contained the emperor's treasure. Even at Rome his position was far from enviable, for Alexander III., having taken refuge in the Colosseum, was prepared to offer a desperate resistance. Accordingly Frederick fell upon the curious expedient of proposing that both Alexander and Pascal should resign, and another pope be elected. The citizens clamorously supported the proposal, but Alexander prevented its accomplishment by suddenly leaving Rome for Benevento. Immediately on his departure, and, to the superstitious fancies of the time, as if in token of the wrath of heaven at his expulsion, and at the sacrilegious violence done to the most sacred edifice of the holy city, suddenly, in the midst of a day of burning and sultry splendor, the whole German army with scarcely an exception was smitten by a pestilence of unexampled virulence, to which the terrors of superstition imparted both additional horror and a more deadly fatality. Frederick led the haggard and terror-stricken crowd of survivors with great difficulty to Pavia, whence at the end of the year he set out for Germany attended by about 30 horsemen; and at Susa he only saved himself from death at the hands of the citizens by escaping during the night on foot accompanied by two followers. For nearly seven years after this luckless flight he remained in Germany. On the death of Pascal III. in September, 1168, he supported the new anti-pope Calixtus III., but by doing so he only lent additional vigor to the Lombard league, who this year had founded the city which in honor of their patron Alexander III. they named Alexandria; and in 1173 they took an oath not to leave off waging war against the emperor till they drove him out of Italy. Resolved, however, on a final effort, Frederick, having collected an immense army, set out in October, 1174, on his fifth and last Italian expedition. He burned Susa to the ground, and captured Asti; but failing in a treacherous attack on Alexandria, made after he had granted it a truce, he endeavored to negotiate a peace with the League. Final terms could not, however, be agreed upon, and notwithstanding the crushing blow which his fortunes at this time sustained through the defection of Henry the Lion, he resolved when recruited by a new army from Germany to risk the battle at Lignano, which resulted in his total defeat, 29th May, 1176. Having in this battle been crushed beneath his horse, he was believed to have fallen, either wounded or dead, into the hands of the confederates; but on the third day afterwards he arrived at Pavia unhurt, but so worn out by hunger and fatigue as to be scarcely recognizable. Finding his case now desperate, he at last agreed to acknowledge the pontificate of Alexander, and also at Venice, 25th July, 1177, concluded a truce of six years with the cities. He then turned his attention to Henry the Lion, who owned himself vanquished in 1181, and was banished to England. On the expiry of the treaty of Venice, the famous treaty of Constance was signed, 25th June, 1183, by which, while the supremacy of the empire was formally recognized, the independent jurisdiction of the cities was substantially guaranteed. Henceforth, Frederick resolved to rule Italy more by conciliation than by compulsion, and while re-establishing his influence in Lombardy by granting such favors to the Milanese as secured their lasting alliance and friendship, he virtually placed Sicily under his immediate government by arranging a marriage between Constance, heiress of that kingdom, and Henry his eldest son, who, having been elected King of the Romans in his infancy, received the crown of Italy on the day of his marriage, 27th June, 1186, from the patriarch of Aquileia.

Having thus at last brought his long life-struggle to an honorable if not very triumphant close, it might have been expected that Frederick would now have been content to doff his armor, and to pass his remaining days in peace. But hearing in 1187 of the victorious progress of Saladin against the Christians in Syria, his martial ardor was again kindled, and he resolved to enter the lists against the redoubtable Saracen conqueror. This purpose he was, however, unable to carry fully out, for after two successful battles in Asia Minor, he was drowned before reaching Syria while crossing a small river in Pisidia, June 10, 1190.

Frederick I. is said to have taken Charlemagne as his model; but the contest in which he engaged was entirely different both in character and results from that in which his great predecessor achieved such a wonderful temporary success. Though Frederick failed to subdue the republics, the failure can scarcely be said to reflect either on his prudence as a statesman or his skill as a general, for his ascendency was finally overthrown rather by the ravages of pestilence than by the might of human arms. In Germany his resolute will and sagacious administration subdued or disarmed all discontent, and he not only succeeded in welding the various rival interests into a unity of devotion to himself against which papal intrigues were comparatively powerless, but won for the empire a prestige such as it had not possessed since the time of Otto the Great. The wide contrast between his German and Italian rule is strikingly exemplified in the fact that, while he endeavored to overthrow the republics in Italy, he held in check the power of the nobles in Germany, by conferring municipal franchises and independent rights on the principal cities. Even in Italy, though his general course of action was warped by wrong prepossessions, he in many instances manifested exceptional practical sagacity in dealing with immediate difficulties and emergencies. Possessing great physical beauty, frank and open manners, untiring and unresting energy, and a prowess which found its native element in difficulty and danger, he seemed the embodiment of the chivalrous and warlike spirit of his age, and was the model of all the qualities which then won highest admiration. Stern and ambitious he certainly was, but his aims can scarcely be said to have exceeded his prerogatives as emperor; and though he had sometimes recourse when in straits to expedients almost diabolically ingenious in their cruelty, yet his general conduct was marked by a clemency which in that age was exceptional. His quarrel with the papacy was an inherited conflict, not reflecting at all on his religious faith, but the inevitable consequence of inconsistent theories of government, which had been created and could be dissipated only by a long series of events. His interference in the quarrels of the republics was not only quite justifiable from the relation in which he stood to them, but seemed absolutely necessary. From the beginning, however, he treated the Italians, as indeed was only natural, less as rebellious subjects than as conquered aliens; and it must be admitted that in regard to them the only effective portion of his procedure was, not his energetic measures of repression nor his brilliant victories, but, after the battle of Lignano, his quiet and cheerful acceptance of the inevitable, and the consequent complete change in his policy, by which if he did not obtain the great object of his ambition, he at least did much to render innoxious for the empire his previous mistakes.

The principal contemporary authorities for the reign of Frederick I. are the chronicle of Otto bishop of Freisingen, to which is prefixed a letter of Frederick containing a summary of the early events of his reign; the continuation of this chronicle from 1158 to 1160 by Radevic, one of the canons of Otto; the chronicle of Otto Morena of Lodi, continued from 1162 to 1167 by his son Acerbus; and the life of Pope Alexander III. by the cardinal of Aragon. The chief modern writers are Muratori, *Annali d'Italia;* Sismondi, *Histoire des Républiques Italiennes;* H. v. Bünau, *Leben und Thaten Friedrichs I.*, Leipsic, 1722; Cherrier, *Histoire de la lutte des papes et des empereurs de la maison de Sonabe*, etc., 2d edition, Paris, 1856; F. von Raumer, *Geschichte der Hohenstaufen und ihrer Zeit*, 4th ed., Leipsic, 1871; P. Scheffer-Boichorst, *Friedrichs letzter Streit mit der Curie*, Berlin, 1866; K. Fischer, *Der Kreuzzug Friedrichs I.*, Leipsic, 1870; H. Prutz, *Kaiser Friedrich I.*, 3 vols., Dantzic, 1871–73; Fr. X. Wegele, *Kaiser Friedrich I. Barbarossa, ein Vortrag*, Nordlingen, 1871; Dettloff, *Der erste Römerzug Kaiser Friedrichs I.*, Göttingen, 1877; Bryce, *Holy Roman Empire;* Milman, *History of Latin Christianity;* C. Vignati, *Storia diplomatica della lega Lombarda*, Milan, 1866; Teste, *History of the Wars of Frederick I. and the Communes of Lombardy*, English translation, 1877; and E. A. Freeman in his first series of *Essays.* (T. F. H.)

FREDERICK II. (1194–1250), Holy Roman Emperor, surnamed the Hohenstaufen, the most remarkable historic figure of the Middle Ages, grandson of the preceding, and son of Henry VI. and of Constance, heiress of the throne of Sicily, was born at Jesi, near Ancona, 26th December, 1194. He was elected king of the Romans in 1196; and, his father having died 28th September, 1197, he was in May, 1198, crowned king of Sicily, his mother obtaining for him the recognition and support of Pope Innocent III. by acknowledging the feudal supremacy of the papacy, by the sacrifice of certain ecclesiastical rights, and by the payment of a yearly tribute. Dying the same year, she bequeathed his guardianship to the pope; but for some time after this Sicily was the scene of hopeless political anarchy, and the custody of the young king at Palermo was the occasion of continual and complicated intrigues, and of a confused and protracted civil war which had very varying results. The pope could thus only fulfil his trust imperfectly, but the education of his ward, so far from suffering on this account, was exceptionally thorough and complete; and the different nationalities with which he came into contact contributed each its quota to the instruction and development of his strong and many-sided character.

Though crowned in infancy king of the Romans, he actually inherited from his father no other throne than that of Naples and Sicily. In 1208 he entered upon the personal government of his kingdom, and in the following year he was married to Constance of Aragon. About this time, Otto, second son of Henry the Lion, had, on account of the murder of Philip of Hohenstaufen by Otto of Wittelsbach, obtained undisputed possession of the throne of Germany; but immediately after his coronation at Rome in 1209 the inevitable jealousy between pope and emperor led to the usual results, and when Otto was meditating the subjugation of Naples and Sicily, he was met in 1211 by a bull of excommunication. At a diet held at Nuremberg in October of the same year it was resolved to offer the crown of Germany to the young king of Sicily. Innocent III. on certain conditions gave his sanction to the offer; and to Frederick, even had he seen in it nothing to incite his imaginative ardor, it must have appeared almost in the form of an unexpected deliverance from impending ruin. Having therefore resolved to dispute his ancestral throne with his rival, he set out in the spring of 1212 on his romantic and hazardous quest. Landing at Genoa on the 1st of May accompanied by only a few adherents, he made his way over the Alps by unfrequented passes to Coire, and learning at St. Gall that Otto was about to occupy Constance, he by great good fortune was able to anticipate him by three hours. The town at once declared in Frederick's favor, and Otto, without seriously attempting to resist his progress in southern Germany, retired to Saxony. In November of the same year Frederick made a treaty with Philip of France, and in December he was elected king at Frankfort, and crowned at Mainz. By inherent force of character, aided by his unrivalled diplomatic skill and his bold and rapid movements, he had won success almost without striking a blow; and his task was at least denuded of all difficulty through Otto's disastrous defeat by Philip at Bouvines, near Tournay, 27th July, 1214. Any further organized resistance was thus rendered impossible against the progress of the Hohenstaufen, who in July, 1215, ascended the marble throne of Charlemagne at Aix-la-Chapelle, and received the silver crown. At a solemn ceremony which followed he took the cross; but even after the death of Otto in May, 1218, he was fully occupied in establishing his influence in Germany. In 1220 he succeeded in obtaining the election of his son Henry to the German throne, but the favor was dearly rewarded by the charter which by the independent privileges it conferred upon the princes virtually dissolved the unity of the kingdom. The election was contrary to a promise made to Pope Innocent III. to appoint Henry king of Sicily, but Pope Honorius III., anxious for the success of the crusade, was pacified without much difficulty, and Frederick leaving Germany in the autumn of 1220 was crowned emperor at Rome on the 22d November, renewing at the same time his oath to set out on the crusade with all possible speed. His absence in Germany had permitted the growth of disorder and confusion in his southern kingdom; and to restrain the license of the Apulian nobles he now established at Capua a tribunal to revise their privileges, while, to deliver the Christians in Sicily from the attacks to which they were continually exposed from the Saracen mountain tribes, he transferred 2000 Saracens to Lucera, an expedient which also established in Italy a convenient instrument of resistance to the papal power.

The departure of the crusade, at first fixed for 1223, was deferred till 1225, and even then it was found necessary to delay it for two years longer; but, his wife Constance having died in 1222, he gave a pledge that his ambition coincided with the papal wishes by marrying in 1225 Yolande, daughter of King John of Jerusalem; and he also bound himself by heavy penalties to set out with a stipulated force in August, 1227. The hostilities between him and the Lombard league, begun in 1226, were suspended through the intercession of Pope Honorius in February, 1227, and the Lombards agreed to furnish a certain number of knights for the expedition. In March Honorius died, and was succeeded by Gregory IX., who on the very day of his accession addressed a new and imperative warning to the emperor against delay in the fulfilment of his oath. Frederick actually set out at the time agreed upon, but returned three days afterwards, and, asserting as his reason a serious illness, permitted the armament to be dissolved, whereupon Gregory without further negotiation launched against him, September 30, the solemn bull of excommunication. The appeal to Christendom with which Frederick met the church's fulmination is remarkable in that, so far from contenting himself with defending his own conduct, he, besides denouncing the temporal pretensions of the pope as menacing the whole of Christendom with an "unheard-of tyranny," asserted that instead of rolling in wealth and aspiring to worldly influence the church's representatives ought to cultivate the simplicity and self-denial of the early Christians. In resolving to set out on the crusade, notwithstanding his excommunication, Frederick was therefore actuated, not merely by the wish to take possession of a secular throne, or to demonstrate the sincerity of his purpose to keep his oath, but by the determination to assert his right still to act as the temporal head of the church. His preparations were not delayed by the death of his wife Yolande in April, 1228, and he set sail from Otranto on the 29th June. Meanwhile, by securing the favor of the Frangipani and the other Roman patricians, he procured the expulsion of Gregory from Rome; but the subtle spiritual influence of the papal ban was not affected by this seeming victory, and tidings of his excommunication reaching the Holy Land almost simultaneously with his arrival, the Knights of the Temple and the Hospital refused to take part in the crusade. Frederick, however, by mere diplomatic tact succeeded in persuading the sultan of Egypt to agree to a treaty, by which the church obtained possession of Jerusalem and the holy places on granting to the Saracens, besides various other privileges, free access to Bethlehem; and on the 18th March, 1229, he, without any religious ceremony, crowned himself with his own hands king of Jerusalem. Such a striking and unexpected success wrought almost immediately throughout Europe a complete revolution of opinion in his favor; and when shortly afterwards he succeeded in defeating the papal forces which had invaded his dominions the pope deemed it expedient to come to terms, and released him from the ban of excommunication 28th August, 1230.

In the interval of peace which followed, Frederick occupied himself in forming for his Sicilian kingdom a code of laws, the main features of which were the superseding of irresponsible feudal and ecclesiastical jurisdictions by a uniform civil legislation administered under direct imperial control; the toleration extended to Jews and Mahometans, and the severe enactments against schismatics; the provisions for the emancipation of the peasants; the regulations for the encouragement of commerce, which contain perhaps the first enunciation of the modern doctrine of free trade; and the establishment of annual parliaments, consisting of barons, prelates, and representatives from the towns and cities. He also devoted much of his attention to the advancement of learning and of the arts and sciences. The university of Naples, founded in 1224, but whose operations had been for some time suspended, he now restored and liberally endowed; at the medical schools of Salerno he provided Arab, Latin, Greek, and Hebrew teachers for the students of these different nationalities; and he caused the translation into Latin of the works of Aristotle and of other philosophers both Greek and Arabic. He himself was learned both in Mussulman arts and sciences and in Christian scholasticism and philosophy; he knew Latin, Greek, French, German, Arabic, and Hebrew. He had a great interest in architecture, and he fostered the infancy of Italian sculpture and painting; he and his minister Peter de Vinea were among the first cultivators of Italian poetry; he also devoted much attention to natural history, and besides forming large collections of rare and curious animals wrote a treatise on the art of falconry, which shows a minute acquaintance with the habits of birds. With the influences of Western civilization there was conjoined at his castles on the Apulian shore an Oriental luxury and splendor; and in the harem of the Christian emperor his accusers found a convenient corroboration of their insinuation regarding his secret enmity to the Christian faith.

The short period of peaceful progress was broken in 1234 by the rebellion of Frederick's son Henry, who, secretly instigated by the pope, joined the Lombard league. The revolt was, however, suppressed on the arrival of the emperor in Germany in 1235, and Henry was sent as a prisoner to the castle of San Felice in Apulia. In the same year Frederick married Isabella, sister of Henry III. of England. Conrad, second son of the emperor, was chosen king by the German princes in January, 1237; and Frederick, after the disastrous defeat of the Lombards at Cortenuova, November 27th of this year, appointed, in October, 1238, his natural son Enzio king of Sardinia. Alarmed at the success of the imperial arms, Gregory, in March, 1239, renewed against the emperor the ban of excommunication; but the latter advancing into the states of the church, captured Ravenna, Faenza, and Benevento; and after gaining, through the help of Enzio, a brilliant victory over the Genoese fleet, was nearing Rome when Gregory died, August 21, 1241. After the short pontificate of Celestine IV. and an interregnum of eighteen months, Cardinal Sinibald Fiesco, up to this time one of the emperor's chief friends, became pope as Innocent IV. in June, 1243. At once negotiations were entered into for an arrangement between them; but the papal demands were too humiliating to permit of their acceptance; and Innocent, suddenly making his escape to Lyons, not only renewed, July 17, 1245, the church's ban against the emperor, but declared his throne vacant. Henry Raspe of Thuringia, elected by the papal party king of the Romans in May, 1246, gained a victory over Conrad at Frankfort on the 5th August, but, suffering a total defeat near Ulm, February 17, 1247, died shortly afterwards; and between his successor William of Holland and Conrad the struggle was carried on with indecisive results. In this same year Peter de Vinea, the minister and most intimate friend of Frederick, was discovered plotting against his life; on 18th February, 1248, Frederick's army in Italy was surprised and utterly routed by a sally of the citizens of Parma; in May, 1249, his son Enzio was defeated and captured by the Bolognese; and, although in 1250 various successes in the north of Italy and the prospect of new and powerful alliances seemed to promise him a speedy and complete triumph, his strength had been so worn out by his arduous struggle, and his spirit so broken by such a succession of disasters, that he died somewhat suddenly on the 13th December, at his hunting lodge of Fiorentino (also called Firenzuola), near Lucera.

The general contemporary opinion regarding Frederick II. is expressed in the words *stupor mundi*; and whatever amount either of approbation or censure may be bestowed upon his career, wonder and perplexity are the predominant sentiments which its contemplation even yet awakens. It was not merely that his mental endowments were exceptionally great, but that, owing to his mingled German and Italian blood, the various influences to which he was subjected in his early years, the strange times in which he lived, and the events with which destiny had connected him, his character was exhibited in such multiform aspects and in such an individual and peculiar light that in history we look in vain for his parallel. As to the nature of his religious faith there are no data for arriving at a certain conclusion. The theory of M. Huillard-Bréholles that he wished to unite with the functions of emperor those of a spiritual pontiff, and aspired to be the founder of a new religion, is a conjecture insufficiently supported by the isolated facts and statements and the general considerations on which it is made to rest. Indeed the character of Frederick seems to have been widely removed from that of a religious enthusiast; and at every critical period of his life he was urged to daring and adventurous projects rather by external circumstances than by either the promptings of ambition or the consciousness of any divine commission. On any theory his enactments in reference to religion are, however, somewhat enigmatical. His persecution of heretics may not have been entirely due to a desire to vindicate his orthodoxy before his Christian subjects; but although his ideas regarding freedom of conscience were either inconsistent or hampered in their action by a regard to expediency, his toleration of the Jews equally with the Mahometans prevents us ascribing his toleration of the latter either to secret sympathy with that form of faith or wholly to political considerations. He was in all probability a believer in astrology, and he shared in many of the other superstitious ideas of his time; but there is no indication that he dreaded any other than temporal consequences from the ban of the church; and if certain features of the Christian system had perhaps an attraction for him, yet both from his reported jests and serious conversation it is evident that his Christian belief, if he possessed one, bore little resemblance to that current in his age. In the extravagant accusations of cruelty, perfidy, and licentiousness with which the church has assailed his memory there is some nucleus of truth; but a candid judgment will arrive at the conclusion that few exposed to such pernicious influences have shown such a decided preference for goodness and truth, and that there have been almost none who against such immense difficulties have wrought to such wise purpose in behalf of human progress and enlightenment, or have fought such a resolute and advantageous battle in behalf of spiritual freedom. In this contest he was not an immediate victor; and indeed the dissolution of the imperial power in Italy which followed his death must be chiefly traced to the fact that his policy was governed by principles too much in advance of his age. But although the beneficial results of his reign are not at a first glance so palpable and undeniable as some of its injurious results, yet so far was he from being a mere untimely precursor of the new era which dawned in Europe more than two centuries after his death that, perhaps in a greater degree than any other, he was instrumental in hastening its arrival, both by sowing the first seeds of the Renaissance in Italy, and by giving to the old system of things a shock which was felt throughout Europe, and continued to work silently long after its reverberations had passed away.

After the death of Frederick the followers of Abbot Joachim continued to assert that he was still alive, and both in Sicily and Germany impostors sprang up who attempted to personate him. The superstition that the "emperor continued to haunt the castle of Kyffhäuser," at one time thought to refer to Frederick Barbarossa, has now been shown to have had its origin in the tradition that

Frederick II. still lived after he had ceased to exercise the functions of emperor.[1]

The contemporary documents bearing on the reign of Frederick are unusually numerous. Most of those not contained in the *Fœdera* of Thomas Rhymer, the *Annales eccles. post Baronium* of Raynaldus, or the historical collections of Muratori, Bouquet, Böhmer, or Pertz will be found in the great work of Huillard-Bréholles, *Historia Diplomatica Frederici Secundi*, 12 vols., Paris, 1852–1861. The principal ancient chronicles are the *Historia Major Angliæ* of Matthew Paris; the chronicle of the Franciscan monk Salimbene, first published in *Monumenta ad provincias Parmensem et Placentinam spectantia*, Parma, 1857; the *Life of Gregory IX.*, by the Cardinal of Aragon; the *Annales Mediolanenses, 1230–1402;* the *Chronicon Rerum per Orbem Gestarum* (1159–1242) of Richard de San Germano; and the *Chronicon Placentinum* and *Chronicon de rebus in Italia gestis,* published in one volume by M. Huillard-Bréholles, Paris, 1856, the former printed from the copy in the Imperial Library, Paris, and the latter never before published, and printed from the copy in the British Museum. The chief modern authorities are Muratori, Cherrier, Von Raumer, Milman, Freeman as above under FREDERICK I.; Giannone, *Storia del Regno di Napoli*, 1723; Hoeffer, *Kaiser Frederich II.*, Munich, 1844; the great work of Huillard-Bréholles, and also his *Vie et Correspondance de Pierre de la Vigne*, Paris, 1866; T. L. Kington, *History of Frederick the Second, Emperor of the Romans*, London, 1862; Schirrmacher, *Kaiser Friedrich II.*, 4 vols., Göttingen, 1859–65; Winkelmann, *Geschichte Kaiser Friedrichs II. und seiner Reiche*, vol. i., Berlin, 1863, vol. ii., Revel, 1865, and a continuation for the years 1239–41 in the *Forschungen zur deutschen Geschichte*, xii. 261–294, 521–566; A. del Vecchio, *La legislazione di Federico II. Imperatore*, Turin, 1874; and Reuter, *Geschichte der religiösen Aufklärung im Mittelalter*, vol. ii., Berlin, 1877. (T. F. H.)

FREDERICK III. (1286–1330), surnamed the Fair, son of King Albert I. of Germany, duke of Austria, and rival for the German crown with Louis IV. the Bavarian. See LOUIS IV.

FREDERICK IV. (1415–1493), German king, as emperor Frederick III., son of Duke Ernest of Styria, was born at Innsbruck, September 21, 1415. Along with his brother Albert the Prodigal he assumed in 1435 the government of Styria, Carinthia, and Carniola, and, having been elected in 1440 to succeed Albert II. as king of Germany, he was crowned at Aix-la-Chapelle in 1442. He devoted his chief attention to the study of astrology, alchemy, and botany, and was so undecided in his purposes and so deficient in energy and force of character that he almost passively submitted to the anarchy and petty external wars which during the whole of his reign disturbed the peace of the empire. At the beginning of his reign he was attacked by his brother Albert, who reigned in Upper Austria, and he found it necessary to pacify him by the payment of a large sum of money; in 1443 he was attacked by the Swiss, and called to his aid the Armagnacs from France, who, however, after their defeat by the Swiss at St. Jakob in 1444, joined his enemies against him, and in 1449 he was compelled to agree to an unfavorable treaty; from 1445 to 1452 Austria was invaded by the Hungarians; in 1447 Sforza successfully usurped the government of Milan; from 1449 to 1456 a war was carried on between Albert of Brandenburg and the city of Nuremberg assisted by the "Eidgenossen;" and from 1449 to 1462 a succession war raged in the Rhenish Palatinate. Frederick, who hoped by cultivating the friendship of the Papacy to win back some of the ancient imperial rights, concluded in 1448 the concordat of Vienna with Pope Nicholas V., and was crowned emperor in 1452. On the death of Ladislaus duke of Austria in 1457, he laid claim to the whole of Austria, and also to the crown of Bohemia and Hungary; but not only was George Podiebrad made king of Bohemia and Matthias Corvinus king of Hungary, but Sigismund of Tyrol obtained part of Carinthia, and Frederick's brother Albert, besides seizing Upper Austria in 1462, took possession of Vienna. On the death of Albert in 1463, Frederick obtained possession of the whole of Austria, with the exception of Carinthia. Nothwithstanding that Frederick in 1468 went to Rome to concert measures with the pope against the Turks, they in 1469 penetrated without resistance to Carniola, and in 1475 advanced nearly to Salzburg. In 1473 he suddenly broke off a negotiation with Charles the Bold at Treves for the marriage of Charles's daughter with his son Maximilian, but the marriage finally took place after the death of Charles, and Maximilian thus became king of the Netherlands. The changeful and crooked policy of the emperor in reference to Poland and Hungary led the kings of both countries to turn their arms against him, and in 1485 Matthias of Hungary drove him from his hereditary dominions, of which he did not regain possession till after the death of Matthias in 1490. Frederick died in 1493.

See Chmel *Regesta Friderici IV.*, Vienna, 1838–40; Kurz, *Oesterreich unter Kaiser Friedrich IV.*, Vienna, 1812; Chmel, *Geschichte Kaiser Friedrichs IV.*, Hamburg, 1840; *Archiv für Oesterr. Geschichtsquellen*, vols. x. and xi.; Müller, *Reichstagsstaat unter Friedrich III.*, 3 vols.

FREDERICK WILLIAM (1620–1688), elector of Brandenberg, was born in Berlin in 1620. He is usually called "The Great Elector," and next to Frederick the Great he was the chief founder of the power of Prussia. A man of immense energy and determination, he devoted himself to his country, missing no opportunity, whether by intrigue or by force of arms, of adding to its extent and its influence. When at the age of twenty (1640) he succeeded to the electorate, he found it almost ruined. His father, George William, being of feeble and vacillating character, had been unable to prevent the inroads of the contending armies during the Thirty Years' War; and they had laid waste nearly the whole land, and treated the inhabitants with horrible cruelty. Frederick William, by skilful management, succeeded in getting rid of these barbarous hordes, and by slow degrees collected an army of about 30,000 men, which very effectually secured for him the respect of his neighbors. It was universally admitted that he was the true heir of the dukes of Pomerania, whose line died out in 1637; but at the Peace of Westphalia the lion's share of their territory was ceded to Sweden, Frederick William receiving only the eastern half of the country, shorn of Stettin. But he also obtained the bishoprics of Halberstadt, Minden, and Camin, with a promise of the archbishopric of Magdeburg. In 1655 war broke out between Sweden and Poland. Charles Gustavus, king of Sweden, compelled Frederick William to join him, and to do homage for Prussia, which had formerly been held in fief of Poland. After a battle of three days at Warsaw, the Poles were defeated (1656). In the following year the elector turned round and concluded an alliance with the Poles, receiving, by the treaty of Wehlau, in return for the promise of his aid, an acknowledgment of the complete independence of Prussia. Charles Gustavus uttered fierce threats of vengeance, but was prevented by sudden death from attempting to execute them. Frederick William had much trouble in inducing the states of Prussia to do homage to him as their sole lawful sovereign; but by a happy mingling of severity and kindness, he overcame in the end all opposition. As duke of Prussia he was now an absolutely independent sovereign, although still owing allegiance to the emperor for his other dominions. In 1666 he received, by the settlement of the Jülich-Cleve dispute, the duchy of Cleve proper, and the counties of Mark and Ravenstein; while Jülich and Berg were to fall to Brandenburg in the event of the Pfalz-Neuburg line dying out. When Louis XIV. invaded the Netherlands in 1674, Frederick William saw the danger which threatened Germany, and his own territories in particular; he therefore persuaded the emperor, various German princes, and the king of Denmark to form an alliance against the French. He soon withdrew from this contest, but in the war which began with the second French invasion of the Netherlands in 1674 he took a leading part. The Swedes sided with France, and were persuaded by Louis XIV. to invade Brandenburg, which they easily overran and devastated. The elector was unable to leave the seat of war for some time, but at last, in the summer of 1675, set out from Franconia, hastening forward with his cavalry, directing the infantry to follow as speedily as possible. Halting at Magdeburg, he heard that the Swedes were divided into three parties, and that the middle party was not more than forty miles off. Although overtaken only by a small body of his infantry, he rapidly advanced on this middle party, and on June 18, at Fehrbellin, after a severe struggle, decisively defeated it. The rest of the Swedes were then easily disposed of. He drove them not only from Brandenburg but from Pomerania, of which he became complete master. Between three and four years afterwards (about Christmas,

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[1] Regarding the *Friedrichsage*, see papers by C. Voigt, S. Riezler, and M. Brosch, in the 26th, 32d, and 35th volumes of H. von Sybel's *Historische Zeitschrift*.

1678) they invaded Prussia, threatening Königsberg. In the dead of winter Frederick started from Berlin with a powerful force, and in the middle of January, 1679, finally beat them, crossing the Frische Haff with 4000 men on sledges. After all, however, he did not obtain Pomerania, for when the peace of St. Germain-en-Laye was concluded in 1679, Louis XIV. insisted on its being restored to his ally, the king of Sweden. Frederick William, indignant at Austria for allowing this, maintained for a time an alliance with France; but he had ultimately to cultivate the friendship of the emperor, from whom he hoped to obtain the Silesian principalities of Liegnitz, Brieg, and Wohlau, which, after 1675, he claimed as his by inheritance. He received the circle of Schwiebus, in Silesia (1686), on condition that he should withdraw his claim and send 8000 men to the help of the emperor in his war with the Turks. Two years afterwards he died. Although famous as a soldier, he was even greater as an administrator. He was the most economical ruler of his age, yet did no injustice to any branch of the state service. Among the most important of his public works may be named the canal between the Oder and the Spree, which still bears his name. After the revocation of the edict of Nantes, he welcomed large numbers of French refugees to his dominions; and long before that time he had offered every encouragement to Flemish settlers, thus giving a powerful impulse to industry and commerce. He was twice married,—his first wife, Louise Henrietta, being a pious and energetic lady, endowed with so clear and penetrating an understanding that her husband took no important step without consulting her.

See Puffendorf, *De rebus gestis Friderici Wilhelmi Magni* (Berlin, 1695); Förster, *Geschichte Friedrich Wilhelms* (4th ed., Berlin, 1855); W. Pierson, *Der Grosse Kurfürst* (Berlin, 1873); Carlyle, *History of Friedrich II. of Prussia.*

FREDERICK I. (1657–1713), the first king of Prussia, was born at Königsberg, 1657. He was the son of the Great Elector by his first marriage. In consequence of a fall from the arms of his nurse his spine was so seriously injured that he was deformed for life. His stepmother intrigued against him incessantly in the interests of her children; and she succeeded in persuading her husband to make a will whereby Frederick should receive only the electoral title and the electoral lands, the remaining territories being divided among his half-brothers. On his accession in 1688 this will was set aside, with the sanction of the emperor, whose support he had obtained beforehand by signing away in his father's lifetime his rights in Schwiebus, a proceeding which, he afterwards maintained, restored his claim to the Silesian principalities. Frederick, having a strong love of pomp and show, strove hard to make his court an imitation of that of Louis XIV. Although without his father's firmness and energy, he seized every occasion of increasing his dominions by purchase; and he obtained, partly in virtue of certain claims inherited from his mother, partly through the influence of William III. of England, the principality of Neufchatel. It had been the intention of the Great Elector to give William III. vigorous support both in his struggle for the English crown and in the wars with France which were seen to be inevitable. Frederick gave effect to this purpose, and his troops played an important part in the battle of the Boyne. In the course of his reign he exercised considerable influence on European politics by placing auxiliary forces at the disposal of friendly princes. The accession of Augustus the Strong of Saxony to the throne of Poland fired his ambition, and for years he endeavored to induce the emperor Leopold I. to recognize him as king of Prussia. At last, in November, 1700, the emperor consented, insisting, however, on various strict conditions, one of which was that in the approaching war of the Spanish succession Prussia should contribute a force of 10,000 men to the Austrian army. Immediately after receiving the imperial sanction, Frederick started with his whole court for Königsberg, where, on January 18, 1701, with much ceremony he crowned himself. He sent 20,000 men into the war of the Spanish succession, and a portion of them did excellent service at the battle of Blenheim. In 1706 Prince Leopold of Dessau led 6000 Prussians to victory at Turin. Frederick died on the 25th February, 1713. By his extravagance he not only exhausted the treasure amassed by his father, but burdened his country with heavy taxes. He was not, however, an unpopular sovereign, and by making Prussia a kingdom he undoubtedly advanced it several stages towards its future greatness. He founded the university of Halle and the Berlin Academy of Sciences, and was fond of protecting enlightened men who suffered persecution. He was three times married, his second wife, Sophie Charlotte, sister of George I. of England, being well known as the friend of Leibnitz and as one of the most cultivated princesses of the age.

See Puffendorf, *De rebus gestis Friderici III.* (Berlin, 1734); W. Hahn, *Friedrich, der erste König von Preussen* (3d ed., Berlin, 1876); Carlyle, *History of Friedrich II. of Prussia.*

FREDERICK WILLIAM I. (1688–1740), king of Prussia, son of Frederick I. by his second marriage, was born in 1688. He spent a considerable time in early youth at the court of his grandfather, the elector of Hanover. On his return to Berlin he was placed under General von Dohna, who trained him to the energetic and regular habits that ever afterwards characterized him. He was soon imbued with a passion for military life, and this was deepened by acquaintance with the duke of Marlborough and Prince Eugene, whom he visited during the siege of Tournay. In nearly every respect he was the opposite of his father, having frugal, simple tastes, a passionate temper, and a determined will. He intensely disliked the French, and highly disapproved the imitation of their manners by Frederick I. and his courtiers. When he mounted the throne, his first act was to dismiss from the palace every unnecessary official, and to regulate the royal household on principles of the strictest parsimony. In 1715 he was forced, in alliance with Russia, Saxony, and Denmark, into a war with Charles XII. of Sweden, in consequence of which, in return for two million thalers paid to Sweden, he obtained the islands of Wollin and Usedom, Stettin, and part of Swedish Pomerania. This was his only war. All through his reign he strenuously insisted on his right to Jülich and Berg in the event of the Pfalz-Neuburg line dying out (which it seemed certain to do), and his anxiety respecting these duchies gives the key to most of his foreign policy. For some time he inclined to an understanding with England and Hanover; but in 1726 he formed an alliance with Austria, and in the Polish war of succession (1733-35) aided her with 10,000 men. Ultimately, however, he perceived that the emperor was not acting honorably by him, and withdrew from the alliance, occupying himself solely with the internal affairs of his kingdom. He despised many things which the modern world holds in high esteem, and was often coarse, violent, and fond of hideous practical jokes. Nevertheless Prussia profited immensely by his reign. He saw the necessity of rigid economy not only in his private life but in the whole administration of the state; and the consequence was that he paid off the debts incurred by his father, and left to his successor an overflowing treasury. He did nothing for the higher learning, and even banished the philosopher Wolf at 48 hours' notice, "on pain of the halter," for teaching, as he believed, fatalist doctrines; but he established many village schools, and he encouraged industry by every means in his power, particularly agriculture. Under him the nation flourished, and although it stood in awe of his vehement spirit, it respected him for his firmness, his honesty of purpose, and his love of justice. He was devoted to his army, the number of which he raised from 48,000 to 83,500; and there was not in existence a more thoroughly drilled or better appointed force. The Potsdam guard, made up of giants collected from all parts of Europe, sometimes kidnapped, was a sort of toy with which he amused himself. The reviewing of his troops was his chief pleasure; but he was also fond of meeting his friends in the evening in what he called his "tobacco college," where he and they, amid clouds of tobacco smoke, discussed affairs of state. He died on the 31st May, 1740, leaving behind him his widow, Sophie Dorothea of Hanover, and a numerous family.

See Morgenstern, *Ueber Friedrich Wilhelm I.* (Brunswick, 1793); J. C. Droysen, *Friedrich Wilhelm I., König von Preussen* (2 vols., Leipsic, 1869); Carlyle, *History of Friedrich II. of Prussia.*

FREDERICK II. (1712–1786), king of Prussia, born on the 24th January, 1712, was the son of Frederick William I., and is usually known as Frederick the Great. He was brought up with extreme rigor, his father devising a scheme of education which was intended to make him a hardy soldier, and prescribing for him every detail of his conduct. So great was Frederick William's horror of everything which did not seem to him practical, that he strictly excluded Latin from the list of his son's studies. Frederick, however, had free and generous impulses which could not be restrained by the sternest system. Encouraged by his mother, and under the influence of his governess, Madame de Roucoulle, and of his first tutor Duhan, a French refugee, he acquired an excellent knowledge of French, and a taste for literature and music. He even received secret lessons in Latin, which his father had invested with all the charms of forbidden fruit. As he grew up he became extremely dissatisfied with the dull and monotonous life he was compelled to lead; and his discontent was heartily shared by his sister, Wilhelmina, a bright and intelligent young princess for whom Frederick had a warm affection. Frederick William, seeing the divergence of his son's tastes from his own, gradually conceived for him an intense dislike, which often found expression in violent outbursts of anger. So harsh was his treatment that Frederick frequently thought of running away and taking refuge at the court of his uncle, George II. of England; and he at last resolved to do so during a journey which he made with the king to South Germany in 1730, when he was eighteen years of age. He was helped by his two friends, Lieutenant Katte and Lieutenant Keith; but by the imprudence of the former the secret was found out. Frederick was placed under arrest, and the king abused him so cruelly on board a yacht at Frankfort that some courtiers had to interfere, and to separate them. Warned by Frederick, Keith escaped; but Katte delayed his flight too long, and a court martial decided that he should be punished with two years' fortress arrest. The king changed this sentence into one of death, and the young soldier was executed outside the fortress of Cüstrin, in which Frederick was kept a close prisoner. On the way to the place of execution Katte had to pass the crown prince's window. "Pardonnez moi, mon cher Katte," cried Frederick, who was broken-hearted at the fate he had brought upon his friend. "La mort est douce pour un si aimable prince," replied Katte. The same court-martial which had judged him decided that as a lieutenant-colonel attempting to desert, the crown prince had incurred the legal penalty of death. For some time the king actually thought of giving effect to the sentence; and he at last relented only in consequence of grave expostulations from the emperor and the kings of Sweden and Poland.

For about fifteen months Frederick now lived in the town of Cüstrin, having an establishment of his own, but serving as the youngest councillor at the Government board there. He took great care not to offend his father, and was partially restored to favor. In 1732 he was made colonel commandant of a regiment in Ruppin, and in the following year he married, in obedience to the king's orders, the Princess Elizabeth Christina, daughter of the duke of Brunswick-Bevern. The palace of Rheinsberg in the neighborhood of Ruppin was built for him, and there he lived until he succeeded to the throne. These years were perhaps the happiest of his life. He discharged his duties with so much spirit and so conscientiously that he ultimately gained the esteem of Frederick William, who no longer feared that he would leave the crown to one unworthy of wearing it. At the same time the crown prince was able to indulge to the full his personal tastes. He carried on a lively correspondence with Voltaire and other French men of letters, and was a diligent student of philosophy, history, and poetry. Two of his best known works were written at this time,—*Considérations sur l'état présent du corps politique de l'Europe* and his *Anti-Macchiavel.* In the former he calls attention to the growing strength of Austria and France, and insists on the necessity of some third power, by which he clearly means Prussia, counterbalancing their excessive influence. The second treatise, which was issued by Voltaire in Hague in 1740, contains a generous exposition of some of the favorite ideas of the 18th century philosophers respecting the duties of sovereigns.

In 1740 he became king. He maintained all the forms of government established by his father, but ruled in a far more liberal and enlightened spirit; he tolerated every form of religious opinion, granted considerable freedom to the press even in political discussion, was most careful to secure an exact and impartial administration of justice, and allowed every one with a genuine grievance free access to his presence. The Potsdam regiment of giants was disbanded, but the real interests of the army were as carefully studied by Frederick as by Frederick William. On the year of his accession, the emperor Charles VI. died. Frederick at once began to make extensive military preparations, and it was soon clear to all the world that he intended to enter upon some serious enterprise. He had made up his mind to take possession of Silesia. For this resolution he is often abused still by historians, and at the time he had the approval of hardly any one out of Prussia. He himself, writing of the scheme in his *Mémoires,* laid no claim to lofty motives, but candidly confessed that "it was a means of acquiring reputation and of increasing the power of the state." He firmly believed, however, that he had inherited lawful claims to the Silesian principalities; and although his father had recognized the Pragmatic Sanction, whereby the hereditary dominions of Charles VI. were to descend to his daughter, Maria Theresa, Frederick insisted that this sanction could refer only to lands which rightfully belonged to the house of Austria. He could also urge that, as Charles VI. had not fulfilled the engagements by which Frederick William's recognition of the Pragmatic Sanction had been secured, Prussia was freed from her obligation. Frederick cannot fairly be charged with having let loose the elements of war which desolated Europe during the next few years, for, independently of him, the elector of Bavaria instantly protested against the Pragmatic Sanction, and there can be no doubt that in any case France would have taken advantage of so favorable a chance of breaking the power of Austria.

Frederick sent an ambassador to Vienna, offering, in the event of his rights in Silesia being conceded, to aid Maria Theresa against her enemies. The queen of Hungary, who regarded the proposal as that of a mere robber, haughtily declined; whereupon Frederick immediately invaded Silesia with an army of 30,000 men. His first victory was gained at Mollwitz on the 10th of April, 1741. Under the impression, in consequence of a furious charge of Austrian cavalry, that the battle was lost, he rode rapidly away at an early stage of the struggle,—a mistake which gave rise for a time to the groundless idea that he lacked personal courage. A second Prussian victory was gained at Chotusitz, near Czeslau, on the 17th May, 1742, by which time Frederick was master of all the fortified places of Silesia. Maria Theresa, in the heat of her struggle with France and the elector of Bavaria, now Charles VII., and pressed by England to rid herself of Frederick, concluded with him, on the 11th June, 1742, the peace of Breslau, conceding to Prussia Upper and Lower Silesia as far as the Oppa, together with the county of Glatz. Frederick made good use of the next two years, fortifying his new territory, and repairing the evils inflicted upon it by the war. By the death of the prince of East Friesland without heirs, he also gained possession of that country. He knew well that Maria Theresa would not, if she could help it, allow him to remain in Silesia; accordingly, in 1744, alarmed by her victories, he arrived at a secret understanding with France, and pledged himself, with Hesse-Cassel and the palatinate, to maintain the imperial rights of Charles VII., and to defend his hereditary Bavarian lands. Frederick began the second Silesian war by entering Bohemia in August, 1744, and taking Prague. By this brilliant but rash venture he put himself in great danger, and soon had to retreat; but in 1745 he gained the battles of Hohenfriedberg, Sorr, and Hennersdorf; and Leopold of Dessau ("Der alte Dessauer") won for him the victory of Kesselsdorf in Saxony. The latter victory was decisive, and the peace of Dresden (December 25, 1745) assured to Frederick a second time the possession of Silesia.

Frederick had thus, at the age of thirty-three, raised himself to a great position in Europe, and henceforth he was the most conspicuous sovereign of his time. He was a thoroughly absolute ruler, his so-called ministers being mere clerks whose business was to give effect to his will. To use his own famous phrase, however, he regarded himself as but "the first servant of the state;" and during the next eleven years he proved that the words expressed his inmost conviction and feeling. All kinds of questions were submitted to him, important and unimportant; and he is frequently censured for having troubled himself so much with mere details. But in so far as these details related to expenditure he was fully justified, for it was absolutely essential for him to have a large army, and with a small state this was impossible unless he carefully prevented unnecessary outlay. Being a keen judge of character, he filled the public offices with faithful, capable, energetic men, who were kept up to a high standard of duty by the consciousness that their work might at any time come under his strict supervision. The Academy of Sciences, which had fallen into contempt during his father's reign, he restored, infusing into it vigorous life; and he did more to promote elementary education than any of his predecessors. He made canals between the Oder and the Elbe, and the Oder and the Havel, and all kinds of manufacture, particularly silk manufacture, owed much to his encouragement. To the army he gave unremitting attention, reviewing it at regular intervals, and sternly punishing negligence on the part of the officers. Its numbers were raised to 160,000 men, while fortresses and magazines were always kept in a state of readiness for war. The influence of the king's example was felt far beyond the limits of his immediate circle. The nation was proud of his genius, and displayed something of his energy in all departments of life. Lessing, who as a youth of twenty came to Berlin in 1749, composed enthusiastic odes in his honor, and Gleim, the Halberstadt poet, wrote of him as of a kind of demi-god. These may be taken as fair illustrations of the popular feeling long before the Seven Years' War.

He despised German as the language of boors, although it is remarkable that at a later period, in a French essay on German literature, he predicted for it a great future. He habitually wrote and spoke French, and had a strong ambition to rank as a distinguished French author. Nobody can now read his verses, but his prose writings have a certain calm simplicity and dignity, without, however, giving evidence of the splendid mental qualities which he revealed in practical life. To this period belong his *Mémoires pour servir à l'histoire de Brandebourg*, and his poem *L'Art de la Guerre*. The latter, judged as literature, is intolerably dull; but the former is a narrative of some value, throwing considerable light on his personal sympathies as well as on the motives of important epochs in his career. He continued to correspond with French writers, and induced a number of them to settle in Berlin, Maupertuis being president of the Academy. In 1752 Voltaire, who had repeatedly visited him, came at Frederick's urgent entreaty, and received a truly royal welcome. The famous Hirsch trial, and Voltaire's vanity and caprice, greatly lowered him in the esteem of the king, who, on his side, irritated his guest by often requiring him to correct bad verses, and by making him the object of rude banter. The publication of *Doctor Akakia*, which brought down upon the president of the Academy a storm of ridicule, finally alienated Frederick; while Voltaire's wrongs culminated in the famous arrest at Frankfort, the most disagreeable elements of which were due to the misunderstanding of an order by a subordinate official.

The king lived as much as possible in a retired mansion, to which he gave the name of Sanssouci,—not the palace so called, which was built after the Seven Years' War, and was never a favorite residence. He rose regularly in summer at five, in winter at six, devoting himself to public business till about eleven. During part of this time, after coffee, he would aid his reflections by playing on the flute, of which he was passionately fond, being a really skilful performer. At eleven came parade, and an hour afterwards, punctually, dinner, which continued till two, or later, if conversation happened to be particularly attractive. After dinner he glanced through and signed cabinet orders written in accordance with his morning instructions, often adding marginal notes and postscripts, many of which were in a caustic tone. These disposed of, he amused himself for a couple of hours with literary work; between six and seven he would converse with his friends or listen to his reader (a post held for some time by La Mettrie); at seven there was a concert; and at half-past eight he sat down to supper, which might go on till midnight. He liked good eating and drinking, although even here the cost was sharply looked after, the expenses of his kitchen mounting to no higher figure than £1800 a year. At supper he was always surrounded by a number of his most intimate friends, mainly Frenchmen; and he insisted on the conversation being perfectly free. His wit, however, was often cruel, and any one who responded with too much spirit was soon made to feel that the license of talk was to be complete only on one side.

At Frederick's court ladies were seldom seen, a circumstance that gave occasion to much scandal for which there seems to have been no foundation. The queen he visited only on rare occasions. She had been forced upon him by his father, and he had never loved her; but he always treated her with marked respect, and provided her with a generous income, half of which she gave away in charity. Although without charm, she was a woman of many noble qualities; and, like her husband, she wrote French books, some of which attracted a certain attention in their day. She survived him by eleven years, dying in 1797.

Maria Theresa had never given up hope that she would recover Silesia; and as all the neighboring sovereigns were bitterly jealous of Frederick, and somewhat afraid of him, she had no difficulty in inducing several of them to form a scheme for his ruin. Russia and Saxony entered into it heartily; and France, laying aside her ancient enmity towards Austria, joined the empress against the common object of dislike. Frederick, meanwhile had turned towards England, which saw in him a possible ally of great importance against the French. A convention between Prussia and Great Britian was signed in January, 1756, and it proved of incalculable value to both countries, leading as it did to a close alliance during the administration of Pitt. Through the treachery of a clerk in the Saxon foreign office, Frederick was made aware of the future which was being prepared for him. Seeing the importance of taking the initiative, and, if possible, of securing Saxony, he suddenly, on the 24th August, 1756, crossed the frontier of that country, and shut in the Saxon army between Pirna and Königstein, ultimately compelling it, after a victory gained over the Austrians at Lowositz, to surrender. Thus began the Seven Years' War, in which, supported by England, Brunswick, and Hesse-Cassel, he had for a long time to oppose Austria, France, Russia, Saxony, and Sweden. Virtually, the whole Continent was in arms against a small state which, a few years before, had been regarded by most men as beneath serious notice. But it happened that this small state was led by a man of high military genius, capable of infusing into others his own undaunted spirit, while his subjects had learned both from him and his predecessors habits of patience, perseverance, and discipline. In 1757, after defeating the Austrians at Prague, he was himself defeated by them at Kolin; and by the shameful convention of Closter-Seven, he was freely exposed to the attack of the French. In November, 1757, however, when Europe looked upon him as ruined, he rid himself of the French by his splendid victory over them at Rossbach, and in about a month afterwards, by the still more splendid victory at Leuthen, he drove the Austrians from Silesia. From this time the French were kept well employed in the west by Prince Ferdinand of Brunswick, who defeated them at Crefeld in 1758, and at Minden in 1759. In the former year Frederick triumphed, at a heavy cost, over the Russians at Zorndorf; and although, through lack of his usual foresight, he lost the battle of Hochkirchen, he prevented the Austrians from deriving any real advantage from their triumph, Silesia still remaining in his hands at the end of the year. The battle of Kunersdorf, fought on August 12, 1759, was the most disastrous to him in the course of the war. He had here to contend both with the Russians and the Austrians; and although at first he had some success, his army was in the end completely broken. "All is lost. Save the royal family," he wrote to his minister Friesenstein; "the consequences of this battle will be worse than the battle itself. I shall not survive the ruin of the Fatherland. Adieu for ever!" But he soon recovered from his despair, and in 1760 gained the important victories of Liegnitz and Torgau. He had now, however, to act on the defensive, and, fortunately for him, the Russians, on the death of the czarina Elizabeth, not only withdrew in 1762 from the compact against him, but for a time became his allies. On October 29 of that year he gained his last victory over the Austrians at Freiberg. Europe was by that time sick of war, every power being more or less exhausted. The result was, that, on February 15, 1763, a few days after the conclusion of the peace of Paris, the treaty of Hubertusburg was signed, Austria confirming Prussia in the possession of Silesia.

It would be difficult to overrate the importance of the contribution thus made by Frederick to the politics of Europe. Prussia was now universally recognized as one of the great powers of the Continent, and she definitely took her place in Germany as the rival of Austria. From this time it was inevitable that there should be a final struggle between the two nations for predominance, and that the smaller German states should group themselves around one or the other. Frederick himself acquired both in Germany and Europe the indefinable influence which springs from the recognition of great gifts that have been proved by great deeds.

His first care after the war was, as far as possible, to enable the country to recover from the terrific blows by which it had been almost destroyed; and he was never, either before or after, seen to better advantage than in the measures he adopted for this end. Although his resources had been so completely drained that he had been forced to melt the silver in his palaces and to debase the coinage, his energy soon brought back the national prosperity. Pomerania and Neumark were freed from taxation for two years, Silesia for six months. Many nobles whose lands had been wasted received corn for seed; his war horses were within a few months to be found on farms all over Prussia; and money was freely spent in the re-erection of houses which had been destroyed. The coinage was gradually restored to its proper value, and trade received a favorable impulse by the foundation of the Bank of Berlin. All these matters were carefully looked into by Frederick himself, who, while acting as generously as his circumstances would allow, insisted on everything being done in the most efficient manner at the least possible cost. Unfortunately, he adopted the French ideas of excise, and the French methods of imposing and collecting taxes,—a system known as the Regie. This system secured for him a large revenue, but it led to a vast amount of petty tyranny, which was all the more intolerable because it was carried out by French officials. It was continued to the end of Frederick's reign, and nothing did so much to injure his otherwise immense popularity. He was quite aware of the discontent the system excited, and the good-nature with which he tolerated the criticisms directed against it and him is illustrated by a well known incident. Riding along the Jäger Strasse one day, he saw a crowd of people. "See what it is," he said to the groom who was attending him. "They have something posted up about your Majesty," said the groom, returning. Frederick, riding forward, saw a caricature of himself: "King in very melancholy guise," says Preuss (as translated by Carlyle), "seated on a stool, a coffee-mill between his knees, diligently grinding with the one hand, and with the other picking up any bean that might have fallen. 'Hang it lower,' said the king, beckoning his groom with a wave of the finger; 'lower that they may not have to hurt their necks about it.' No sooner were the words spoken, which spread instantly, than there rose from the whole crowd one universal huzzah of joy. They tore the caricature into a thousand pieces, and rolled after the king with loud '*Lebe Hoch*, our Frederick for ever,' as he rode slowly away." There are scores of anecdotes about Frederick, but not many so well authenticated as this.

There was nothing about which Frederick took so much trouble as the proper administration of justice. He disliked the formalities of the law, and in one instance, "the Miller-Arnold case," in connection with which he thought injustice had been done to a poor man, he dismissed the judges, condemned them to a year's fortress-arrest, and compelled them to make good out of their own pocket the loss sustained by their supposed victim,—not a wise proceeding, but one springing from a generous motive. He once defined himself as "l'avocat du pauvre," and few things gave him more pleasure than the famous answer of the miller whose windmill stood on ground which was wanted for the king's garden. The miller sturdily refused to sell it. "Not at any price?" said the king's agent; "could not the king take it from you for nothing, if he chose?" "Have we not the Kammergericht at Berlin?" was the answer, which became a popular saying in Germany. Soon after he came to the throne Frederick began to make preparations for a new code. In the year 1749–51 his grand-chancellor, Von Cocceji, a man of wide knowledge and solid judgment, finished "The Project of the Corporis Juris Fridericiani," which was afterwards made the basis of a legal system drawn up by the grand-chancellor Von Cramer—a system that came into operation in 1794 under Frederick's successor.

Looking ahead after the Seven Years' War, Frederick saw no means of securing himself so effectually as by cultivating the good will of Russia. In 1764 he accordingly concluded a treaty of alliance with the empress Catherine for eight years. Six years afterwards, unfortunately for his fame, he joined in the first partition of Poland, by which he received Polish Prussia, without Dantzic and Thorn, and Great Poland as far as the Netzefluss. Prussia was then for the first time made continuous with Brandenburg and Pomerania. Frederick would have run great risks had he refused to take part in this arrangement; but it was none the less a shameful violation of international law, the full penalty for which has perhaps not even yet been paid.

The emperor Joseph II., being of an ardent and impulsive nature, greatly admired Frederick, and visited him at Neisse, in Silesia, in 1769, a visit which Frederick returned, in Moravia, in the following year. The young emperor was frank and cordial; Frederick was more cautious, for he detected under the respectful manner of Joseph a keen ambition that might one day become dangerous to Prussia. Ever after these interviews a portrait of the emperor hung conspicuously in the rooms in which Frederick lived, a circumstance on which some one remarked. "Ah yes," said Frederick, "I am obliged to keep that young gentleman in my eye." Nothing came of these suspicions till 1777, when, after the death of Maximilian Joseph, elector of Bavaria, without children, the emperor took possession of the greater part of his lands. The elector palatine, who lawfully inherited Bavaria, came to an arrangement, which was not admitted by his heir, the duke of Zweibrücken, afterwards King Maximilian I. of Bavaria. The latter appealed to Frederick, who, resolved that Austria should gain no unnecessary advantage, took his part, and brought pressure to bear upon the emperor. Ultimately, greatly against his will, Frederick felt compelled to draw the sword, and in July, 1778, crossed the Bohemian frontier at the head of a powerful army. No general engagement was fought, and after a great many delays, the treaty of Teschen was signed on the 13th May, 1779. Austria received the circle of Burgau, and consented that the king of Prussia should take the Franconian principalities. Frederick never abandoned his jealousy of Austria, whose ambition he regarded as the chief danger against which Europe had to guard. He seems to have had no suspicion that evil days were coming in France. It was Austria which had given trouble in his time; and if her pride were curbed, he fancied that Prussia at least would be safe. Hence one of the last important acts of his life was to form, in 1785, a league of princes (the "Fürstenbund") for the defence of the imperial constitution, believed to be imperilled by Joseph's restless activity. The league came to an end after Frederick's death; but it is of considerable historical interest, as the first open attempt of Prussia to take the lead in Germany.

Frederick's chief trust was always in his treasury and his army. By continual economy he left in the former the immense sum of 70 million thalers; the latter, at the time of his death, numbered 200,000 men, disciplined with all the strictness to which he had throughout life accustomed his troops. He died at Sanssouci on the 17th August, 1786; his death being hastened by exposure to a storm of rain, stoically borne, during a military review. He passed away on the eve of tremendous events, which for a time obscured his fame; but now that he can be impartially estimated, he is seen to have been in many respects one of the greatest figures in modern history.

He was rather below the middle size, in youth inclined to stoutness, lean in old age, but of vigorous and active habits. An expression of keen intelligence lighted up his features, and his large, sparkling, gray eyes darted penetrating glances at every one who approached him. In his later years an old blue uniform with red facings was his usual dress, and on its breast was generally some Spanish snuff, of which he consumed large quantities. He shared many of the chief intellectual tendencies of his age, having no feeling for the highest aspirations of human nature, but submitting all things to a searching critical analysis. Of Christianity he always spoke in the mocking tone of the "enlightened" philosophers, regarding it as the invention of priests; but it is noteworthy that after the Seven Years' War, the trials of which steadied his character, he sought to strengthen the church for the sake of its elevating moral influence. He cannot be truly described as an atheist, for he regarded the world as probably the creation of a demiurgus,—of a demiurgus, however, who could not be supposed to take interest in the petty affairs of men. In his judgments of mankind he often talked as a misanthrope. He was once conversing with Sulzer, who was a school inspector, about education. Sulzer expressed the opinion that education had of late years greatly improved. "In former times, your Majesty," he said, "the notion being that mankind were naturally inclined to evil, a system of severity prevailed in schools; but now, when we recognize that the inborn inclination of men is rather to good than to evil, schoolmasters have adopted a more generous procedure." "Ah, my dear Sulzer," replied the king, "you don't know this damned race" ("Ach, mein lieber Sulzer, er kennt nicht diese verdammte Race"). This fearful saying unquestionably expressed a frequent mood of Frederick's; and he sometimes acted with great harshness, and seemed to take a malicious pleasure in tormenting his acquaintances. Yet he was capable of genuine attachments. He was beautifully loyal to his mother and his sister Wilhelmina; his letters to the duchess of Gotha are full of a certain tender reverence; the two Keiths found him a devoted friend. But the true evidence that beneath his misanthropical moods there was an enduring sentiment of humanity is afforded by the spirit in which he exercised his kingly functions. Taking his reign as a whole, it must be said that he looked upon his power rather as a trust than as a source of personal advantage; and the trust was faithfully discharged according to the best lights of his day. He has often been condemned for doing nothing to encourage German literature; and it is true that he was supremely indifferent to it. Before he died a tide of intellectual life was rising all about him; yet he failed to recognize it, declined to give Lessing even the small post of royal librarian, and thought *Götz von Berlichingen* a vulgar imitation of vulgar English models. But when his taste was formed, German literature did not exist; the choice was between Racine and Voltaire on the one hand and Gottsched and Gellert on the other. He survived into the era of Kant, Goethe, and Schiller, but he was not of it, and it would have been unreasonable to expect that he should in old age pass beyond the limits of his own epoch. As Germans now generally admit, it was better that he let their literature alone, since, left to itself, it became a thoroughly independent product. Indirectly he powerfully promoted it by deepening the national life from which it sprang. At a time when there was no real bond of cohesion between the different states, he stirred among them a common enthusiasm; and in making Prussia great he laid the foundation of a genuinely united empire.

In 1846–57, Frederick William IV. caused a magnificent edition of Frederick's writings to be issued by the Berlin Academy, under the supervision of Preuss. It is in 30 volumes, of which 6 contain verse, 7 are historical, 2 philosophical, and 3 military, 12 being made up of correspondence.

See Carlyle, *History of Friedrich II. of Prussia*; Droysen, *Friedrich der Grosse* (2 vols., Leipsic, 1874–76, forming Part v. of his *Geschichte der Preussischen Politik*); F. Förster, *Friedrich der Grosse, geschildert als Mensch, Regent, und Feldherr* (4th ed., Berlin, 1860); Rigollot, *Frédéric II., Philosophe* (Paris, 1875); Schröder, *Friedrich der Grosse in seinen Schriften* (3 vols., Leipsic, 1875–76). (J. SI.)

FREDERICK WILLIAM II. (1744–1797), king of Prussia, was the nephew of Frederick the Great. His father, Augustus William, the second son of Frederick William I., having died in 1757, Frederick William was nominated by the king successor to the throne. He was of an easy-going nature, fond of pleasure, and without the capacity for hard work that characterized his foremost predecessors. His loose mode of life alienated from him the sympathies of his uncle, into whose presence he was not admitted for several years. In the war of the Bavarian succession in 1778, however, he received an expression of approval from Frederick in consequence of an act of personal courage. When he mounted the throne, Prussia held a high place on the Continent; her military fame was splendid; and the national finances were in a flourishing condition. The young king had some good impulses, and made himself popular for a time by lightening a few of the burdens of the people, abolishing the tyrannical method of collecting taxes which Frederick had instituted, and encouraging trade. He gave himself up, however, to the advice of unworthy favorites, and soon lost the goodwill both of his subjects and of Europe. For a time he continued the decided policy of his uncle towards Austria, vigorously supporting Turkey against her in 1790. But in the same year he concluded the Reichenbach convention, whereby a nominally good understanding was effected between the two countries, various difficulties being removed during a personal interview of Frederick William with the emperor Leopold II. at Pillnitz in 1791. In 1792, associating himself with the emperor in the war with France, Frederick William sent across the Rhine an army of 50,000 men under the duke of Brunswick. A separate peace was concluded by Prussia in 1795. The dilatoriness with which he prosecuted this war was due to jealousy respecting the policy of Austria and Russia towards Poland. He had formally recognized in 1790 the integrity of Poland; but in 1793, after a vast amount of intrigue, he took part with Russia in the second partition, gaining thereby what is now called South Prussia, with Dantzic and Thorn. The following year brought the third partition, which extended Prussia from the Niemen to Warsaw. Some time before these partitions, in consequence of an understanding with the margrave, signed December 2, 1791, the king had gained possession of the principalities of Baireuth and Anspach. The size and population of Prussia were thus largely increased under Frederick William II.; but, except in the case of Baireuth and Anspach, he attained his aims by means which the more intelligent class of his subjects did not approve, and by his vacillating policy he greatly lowered the state in the esteem of the world. He not only exhausted the resources accumulated by Frederick the Great, but imposed on the country a burden of debt; and he excited much ill-feeling by introducing a severe censorship of the press, and by subjecting the clergy to laws conceived in a spirit of the narrowest orthodoxy. He died on the 16th November, 1797. His first wife having been divorced in 1769, he married the Princess Louise of Hesse-Darmstadt, by whom he had five sons.

FREDERICK WILLIAM III. (1770–1840), king of Prussia, was the eldest son of Frederick William II., and was born on the 3d August, 1770. He was carefully trained under the supervision, in early youth, of his grand-uncle, Frederick the Great. As crown prince he accompanied his father in 1791, to the interview with the emperor at Pillnitz, and in the following year visited with him the army in the Rhine country which was making war with France. In 1793 he married the Princess Louise, daughter of the duke of Mecklenburg-Strelitz. She became a highly popular queen, and thoroughly deserved the affection and respect with which she was regarded. Simple and unostentatious in manner, she was of a refined and gentle disposition, yet endowed with a quick and keen intelligence, and with an heroic spirit which the greatest disasters could not break. Her husband's character was not nearly so interesting. He was rather dull and slow; but he had a sincere desire for the welfare of his people; was capable in emergencies of undertaking a great enterprise, and allowed himself to be freely influenced by the loftier impulses of his wife. When he succeeded to the throne he at once removed the principal grievances due to the weakness of his father, and called to his aid capable and honest ministers. By the treaty of Lunéville, in 1801, he was obliged to concede to Napoleon his territory on the left bank of the Rhine; but he received some compensations. In 1805 he was brought for a short time into conflict with England for accepting Hanover from Napoleon in return for certain concessions. Up to this time he had remained at peace with France; but the formation of the Confederation of the Rhine in 1806 filled him with alarm and indignation, and, giving way to a sudden impulse, he demanded that all French troops should forthwith quit German soil. The result was the battles of Jena and Auerstädt, followed by those of Eylau and Friedland; and on July 9, 1807, he had to sign the treaty of Tilsit, which deprived him of half his kingdom. Early in the war he had been obliged to leave Berlin with the queen, and not till the end of 1809 were they able to return. In 1810 the queen died. Meanwhile, under the guidance of the great minister Stein, who was succeeded by Hardenberg, he had begun thoroughly to reorganize the state; while, through the exertions of Scharnhorst and Gneisenau, the army, in which the traditions of a past age had survived too long, was raised to a state of high efficiency. The king was forced in 1812 to conclude an alliance with Napoleon, and to aid him with an auxiliary corps in his expedition to Russia; but seeing the disastrous retreat of the French from Moscow, Frederick William appealed to the country to undertake a war of liberation. In due time the appeal was followed by the battle of Leipsic and the battle of Waterloo. After the conclusion of peace he labored sincerely, with the aid of competent ministers, to undo many of the evils caused by the confusion of the previous years; but he forgot that in his time of need he had promised to set up a constitutional system of government. He only instituted (1817) provincial estates; and after the July Revolution he proved himself an uncompromising and bitter opponent of liberal ideas. He died on the 7th of June, 1840.

See W. Hahn, *Friedrich Wilhelm III. und Louise* (2d ed., Berlin, 1876); Duncker, *Aus der Zeit Friedrichs des Grossen und Friedrich Wilhelms III.* (Leipsic, 1876).

FREDERICK WILLIAM IV. (1795–1861), king of Prussia, the son of Frederick William III., was born on the 15th October, 1795. He took an active part in the War of Liberation, and in 1814 spent some time in Paris, in whose museums and picture galleries he acquired a warm love of art. On returning to Berlin he cultivated his artistic tastes under the guidance of Rauch and Schinkel, receiving at the same time instruction in jurisprudence and finance from Savigny and other distinguished teachers. He married Princess Elizabeth of Bavaria in 1823, but had no children. As he was known to be cultivated, intelligent, and generous, high hopes were formed respecting his reign; and these hopes were fostered by his first acts as king, for he conceded greater freedom of the press than had been allowed under his father, granted an amnesty to political prisoners, and invited to his capital some of the leading writers and artists of the day. He soon, however, disappointed popular expectations. He was a lover rather of large phrases than of great actions, being very willing to benefit his subjects, but on condition that they should accept what he offered them as the gift of an absolute ruler. In 1847 he assembled at Berlin a united diet, made up of representatives of the provincial diets established by his father, and created intense discontent by proclaiming that he would not allow a constitution to stand between him and his people. The revolutionary movement of 1848 took him wholly by surprise, and he was so alarmed that he not only promised to institute parliamentary government, but placed himself at the head of the agitation for the unity of Germany. When, however, in 1849 the national assembly at Frankfort offered him the title of emperor, he declined it. He formed an alliance with Hanover and Saxony for the purpose of creating a new German constitution, and summoned a national parliament at Erfurt. Austria insisted on the old Frankfort diet being re-established, and for a time war appeared to be imminent. Ultimately, by the treaty of Olmütz (1850) Austria prevailed. In 1850 the Prussian constitution was proclaimed, but it was interpreted in a narrow sense, and under the reactionary ministry of Manteuffel some of its most essential provisions were soon changed. In 1848 Neufchatel had been incorporated with Switzerland. Certain royalists having attempted in 1856 to secure it again for the king of Prussia, they were seized by the Swiss authorities and accused of high treason. After some angry negotiations they were given up, and Frederick William then formally resigned all claims to the country. On his way back from Vienna in the summer of 1857 he had a stroke of paralysis in Dresden; in October of the same year he had a second stroke in Berlin. From this time, with the exception of brief intervals, his mind was clouded, and the duties of government were undertaken by his brother William, who on October 7, 1858, was formally recognized as regent. The king spent the winter of 1858–59 in Rome, where his health occasionally improved, but when he returned to Berlin in November, 1860, his end was seen to be near, and he died at Sanssouci on the night of January 2, 1861.

See Varnhagen von Ense's *Blätter aus der Preussischen Geschichte* (5 vols., Leipsic, 1868–69); and *Briefwechsel Friedrich Wilhelms IV. mit Bunsen* (Leipsic, 1873).

FREDERICK I. (1369–1428), elector and duke of Saxony, surnamed the Pugnacious, eldest son of Landgraf Frederick the Severe of Thuringia and of Catherine countess of Henneberg, was born at Altenburg, March 29, 1369. On the death of his father in 1381, he and his two brothers succeeded to the inheritance under the guardianship of their mother, but were compelled to grant a portion of it to their father's two brothers. The death of one of their father's brothers in 1407 occasioned a renewal of the inheritance dispute with the remaining brother, and an amicable settlement was not arrived at till 1410. Previous to this Frederick had distinguished himself in wars against the Lithuanians, Hungary, and King Wenzel of Germany; and having in 1420 collected an army against the Hussites, he was for a time so uniformly successful, that in 1423 the emperor Sigismund, in recognition of his valuable services, created him elector and duke of Saxony. With these honors, however, Sigismund also laid upon him the whole burden of the Hussite war; and the result was that, by an overwhelming defeat at Aussig in 1426, nearly all the Saxons capable of bearing arms were either killed or placed *hors de combat.* Frederick did not long survive this disaster, dying at Altenburg, 4th January, 1428. The university of Leipsic was founded by Frederick in 1409.

See life by Spalatin in Mencke's *Scriptores rerum Germ.*; and life by Horn, Leipsic, 1733.

FREDERICK II. (1411–1464), elector and duke of Saxony, surnamed the Meek, son of the former and of Catherine of Brunswick, was born August 22, 1411, and succeeded his father in 1428. His reign is remarkable only for his long-continued dispute with his uncles and brothers regarding the partition of Saxony—a dispute which, though finally settled in 1451 by the interposition of the emperor in Frederick's favor, led, in 1455, to the famous attempt by a knight named Kunz von Kaufungen to abduct the two sons of Frederick, Ernst and Albert. A graphic description of the plot and its accidental frustration will be found in a paper on the "Prinzenraub" in Mr. Carlyle's *Miscellaneous Works.* Frederick died at Leipsic, 7th September, 1464.

For the literature connected with the "Prinzenraub," see W. Schäfer, *Der Montag vor Kiliani*, 1855; and J. Gersdorf, *Einige Actenstücke zur Geschichte des Sächsischen Prinzenraubes*, 1855.

FREDERICK III. (1463–1525), elector and duke of Saxony, surnamed the Wise, grandson of the preceding and son of Duke Ernst, was born at Torgau, January 17, 1463. On the death of his father in 1486, he succeeded him in the sole government of Saxony, but divided the other possessions of the Ernestine line with his brother John the Constant. Frederick founded the university of Wittenberg in 1502, and appointed Melanchthon and Luther to two of its chairs. Though he never formally adopted the principles of the Reformation, he granted to the Reformers his friendly countenance, and in 1521 he secured the safety of Luther during the diet of Worms, and afterwards sheltered him in the castle of Wartburg. In 1493 Frederick made a pilgrimage to the Holy Land, and was made in Jerusalem a knight of the Holy Sepulchre. He was three times imperial vicar, and on the death of Maximilian I. he was offered the imperial throne but declined it, and, in accordance with his recommendation, it was bestowed on Charles V. Frederick died at Lochau, 5th May, 1525.

See life published from Spalatin's manuscript by Neudecker and Preller, 1851, and another by Tutzschmann, 1848.

FREDERICK AUGUSTUS I., elector of Saxony. See Augustus II., of Poland, vol. iii. p. 74.

FREDERICK AUGUSTUS II., elector of Saxony. See Augustus III., of Poland, vol. iii. p. 74.

FREDERICK AUGUSTUS I. (1750–1827), king of Saxony, son of Elector Frederick Christian, was born at Dresden, 23d December, 1750, succeeded his father, under the guardianship of Prince Xavier, in 1763, and was declared of age in 1768. In the following year he married Princess Maria-Amelia of Deux-Ponts. On account of the claims of his mother on the inheritance of her brother, the elector of Bavaria, he sided with Frederick the Great in the short Bavarian succession war of 1778 against Austria; and he afterwards joined the league of German princes formed by that monarch. In 1791 he declined the crown of Poland. He refused to join the league against France in 1792, but when war was declared his duty to the German empire necessitated his taking part in it. He maintained his neutrality during the war between France and Austria in 1805, but in the following year he joined Prussia against France. After the disastrous battle of Jena he concluded a treaty of peace with Napoleon at Posen, 11th November, 1806, and, assuming the title of king, he joined the Rhenish confederation. Having taken part in the subsequent wars of Napoleon, he fell into the hands of the allies after the entry into Leipsic, 19th October, 1813; and although he regained his freedom after the congress of Vienna, he was compelled to give up the province of Wittenberg to Prussia. The remainder of his life was spent in developing the agricultural, commercial, and industrial resources of his kingdom, reforming the administration of justice, establishing hospitals and other charitable institutions, encouraging art and science, and promoting education. He had a special interest in botany, and originated the beautiful botanical garden at Pillnitz. His reign throughout was characterized by justice, probity, moderation, and prudence. He died May 5, 1827.

See lives by Weisse, Leipsic, 1811; Herrmann, Dresden, 1827; and Pölitz, Leipsic, 1830.

FREDERICK AUGUSTUS II. (1797–1854), king of Saxony, eldest son of Prince Maximilian and of Caroline-Maria Theresa of Parma, was born May 18, 1797. The unsettled times in which his youth was passed necessitated his frequent change of residence, but care was nevertheless taken that his education should not be interrupted, and he also acquired through his journeys in foreign states and his intercourse with men of eminence, a special taste for art and for natural science. He was twice married—in 1819 to the Duchess Caroline, eldest daughter of the emperor Francis I. of Austria, and in 1833 to Maria, daughter of Maximilian I. of Bavaria. In 1830 a rising in Dresden led to his being named joint regent of the kingdom along with King Antony; and in this position his popularity and his wise and liberal reforms speedily quelled all discontent. On June 1, 1836, he succeeded his uncle on the throne. Though he administered the affairs of his kingdom with enlightened liberality, Saxony did not escape the political storms which broke upon Germany in 1848; and an insurrection in Dresden in May, 1849, compelled him to call in the help of Prussian troops. From that time, however, his reign was tranquil and prosperous. His death occurred accidentally through the upsetting of his carriage between Imst and Wenns, in Tyrol, 9th August, 1854. Frederick devoted his leisure hours chiefly to the study of botany. He made botanical excursions into different countries, and *Flora Marienbadensis, oder Pflanzen und Gebirgsarten gesammelt und beschrieben*, written by him in conjunction with Goethe, was published at Prague in 1837.

FREDERICK I. (1425–1476), elector palatine, surnamed the Victorious, second son of Elector Louis III., was born in 1425. He inherited a part of the palatinate on the death of his father in 1439, but delivered it up to his brother Louis IV. On the death of Louis in 1449, he became guardian of the infant heir Philip, and administrator of the kingdom. In 1452, on account of the threatening relation in which the neighboring princes stood to the palatinate, he resolved to assume the office of elector for life, on the understanding that his children should not hold the rank of princes, and that his nephew should be his successor. This led to a combination against him headed by the emperor Frederick III., but he managed to defend himself against all attacks, and in 1462 defeated at Seckenheim a combined army sent against him under the command of elector Albert Achilles of Brandenburg, after which he remained in undisturbed possession of his kingdom till his death, 12th December, 1476. Under him the palatinate received an addition of more than 60 fortresses and towns. Through his marriage with the daughter of a citizen of Augsburg he had two sons, the elder of whom, Frederick, adopted the ecclesiastical profession, and the younger, Louis, was the founder of the family of the princes and counts of Löwenstein.

See lives by Kremer, in 2 vols., Frankfort and Leipsic, 1765; and by Menzel, from 1454 to 1464, Munich, 1861.

FREDERICK II. (1482–1556), elector palatine, surnamed the Wise, fourth son of Philip the Noble-minded, was born in 1482, and succeeded his brother Louis as elector in 1544. During the siege of Vienna by Sultan Soliman II. in 1529, he held the command of the army of the empire. In 1535 he married Dorothea daughter of Christian II., ex-king of Denmark. Through the persuasion of Melanchthon he embraced the principles of the Reformation and joined the Smalkald League, but he afterwards signed the Augsburg Interim, and became reconciled with Charles V. He died in 1556.

FREDERICK III. (1515–1576), elector palatine, surnamed the Pious, eldest son of John II., palatine of Simmern, was born in 1515, succeeded his father in 1556, and became elector palatine on the death of Otto Henry in 1559. On his marriage in 1537 to the Lutheran princess Maria of Brandenburg-Baireuth, he adopted the Protestant faith, and in 1560 he replaced the Lutheran confession and worship by that of the Reformed or Calvinistic, on which account an unsuccessful attempt was made in 1566 by several of the Lutheran princes to obtain an imperial edict against him. He died 26th October, 1576.

See Kluckhohn, *Friedrich der Fromme*, Nördlingen, 1878. Two volumes of his letters were previously edited by Kluckhohn.

FREDERICK IV. (1574–1610), elector palatine, surnamed the Upright, son of Elector Louis VI. and of Elizabeth of Hesse, was born in 1574, succeeded his father under the guardianship of his uncle John Casimir in 1583, and after the death of the latter in 1592 ruled as independent governor. His reign is chiefly of importance for the steadfast and firm support he rendered to the Protestant cause. Under his auspices the Protestant union of Germany was formed in 1601. Mannheim, which had greatly increased through the influx of Protestant refugees, was raised by him to the rank of a town. He died in 1610

FREDERICK V. (1596–1632), elector palatine and king of Bohemia, son of Frederick IV. and of Louisa Julia, daughter of William of Orange, was born in Amberg in 1596, and succeeded his father in 1610, under the guardianship of Duke John of Deux-Ponts. In 1613 he married Elizabeth, daughter of James I. of England; and on undertaking the government of his palatinate two years afterwards, he became the head of the Protestant union of German princes, on which account, and because of his connection with England, he was in 1619 chosen king of Bohemia. He shrank from this difficult position, but at last accepted it, partly owing to his wife's influence, but mainly in deference to the entreaties of a number of landless princes who had great power over him. When his forces were confronted at Prague, November 8, 1620, by those of the emperor under Tilly, his courage so utterly forsook him that he fled in panic from the field before the battle had commenced, and ignominiously took refuge in Holland from the dangers and difficulties of his position—the general ridicule with which he was regarded being indicated by dubbing him with the title "Winter-King." The remainder of his life was spent in vain endeavors to enlist the help of various European sovereigns to enable him to wrest his palatinate from Duke Maximilian of Bavaria, who had been invested with its sovereignty by the emperor. Frederick died at Mainz, November 19, 1632.

FREDERICK CITY, the capital of Frederick county, Maryland, U. S., is situated on Carroll's Creek, a tributary of the Monocacy, 45 miles N.W. of Washington. It is well and regularly built, and most of its houses are of brick or stone. It has a considerable agricultural trade, and its industries include iron, wood, leather, paper, and the preserving of fruit and vegetables. Among its educational institutions are the college established by the State in 1797, the female seminary, the academy connected with the convent of the Visitation nuns, and the deaf and dumb institution. During the civil war the city was occupied on different occasions by the opposing armies. The population of Frederick in 1860 was 8142, and in 1870, 8526, of whom 1822 were colored.

FREDERICKSBURG, a city of Spottsylvania county, Virginia, U. S., on the S.W. side of the Rappahannock river, 110 miles above its mouth in Chesapeake Bay, and 61 miles N. of Richmond. The river, which is tidal up to this point, is here closed by a dam 900 feet long. It supplies motive-power for flour and other mills, and affords facilities for transportation of grain, marble, and freestone. Near the city is an unfinished monument, begun in 1833, over the grave of the mother of Washington. At Fredericksburg the Federal troops sustained a repulse by the Confederate forces, December 13, 1862. The population in 1860 was 5022, and in 1870, 4046, of whom 1331 were colored.

FREDERICKSHALD, or FREDERICKSHALL, a maritime town of Norway, stift of Christiania, at the junction of the Iddefjord with the Tistedals, 57 miles S.S.E. of Christiania. It has an excellent harbor, and considerable trade in tobacco, sugar, iron, and wood. A regular line of steamers connects it with Christiania. Frederickshald is noted for its strong castle of Fredericksteen, which stands on a perpendicular rock 350 feet high overhanging the sea, and is considered one of the strongest fortresses in Europe. It was at the siege of this fortress that Charles XII., king of Sweden, was killed on 11th December, 1718. The town itself is not walled. Its old name was Halden, and it received the addition of Frederick from Frederick III. of Denmark and Norway after its successful defence against the Swedes in 1665. It was almost totally destroyed by fire in 1759, and has since been rebuilt in a neat and regular manner. The castle surrendered to the Swedish crown-prince Bernadotte in 1814, and its capture was speedily followed by the conquest of the kingdom and its union with Sweden. The population in 1875 was 9956.

FREDERICKSTAD, a fortified town of Norway, stift of Christiania, is situated at the mouth of the Glommen, 48 miles S.E. of Christiania. The principal buildings are the church, the town-hall, the arsenal, and the magazine. It has manufactures of hardware, pottery, and brandy, and a considerable shipping trade and commerce in wood. About a mile and a half distant is the fall of the Glommen known as Sarpfos. Frederickstad was founded by Frederick II. in 1567. It was for a long time strongly fortified, and in 1716 Charles XII. of Sweden made a vain attempt to capture it. The population in 1875 was 9562.

FREDERICTON, a city and port of entry of New Brunswick, Canada, capital of the province, is situated on the St. John river, 88 miles from its mouth. It stands on a plain bounded on one side by the river, which is here three-fourths of a mile broad, and on the other by a range of hills which almost encircle the town. It is regularly built with long and straight streets, and contains some handsome public buildings, among which are the province hall, the government house, the county court-house, the cathedral church, the university, and several other educational establishments. Fredericton is the principal commercial entrepôt with the interior of the province, and has also a large trade in lumber. The river is navigable for large steamers up to the city, and above it transport is effected in vessels of lighter draughts. A steam-ferry across the river connects the city with the town of St. Mary. Fredericton was incorporated in 1849. Population in 1852, 4458, and in 1871, 6006.

FREE CHURCH OF SCOTLAND, THE, is the name of a well-known ecclesiastical organization which includes a considerable proportion of the inhabitants of Scotland. In one sense the Free Church dates its existence from the Disruption of 1843, in another it claims to be the rightful representative of the National Church of Scotland as it was reformed in 1560.[1] In order to indicate the nature of the grounds on which this claim is made, it will be necessary briefly to point out how the leading facts of the ecclesiastical history of Scotland during the last 320 years are accentuated and construed by those who read them in a Free Church sense.

In that history the Free Churchman sees three great reforming periods. In his view these deserve to be called reforming on many accounts, but most especially because in them the independence of the church, her inherent scriptural right to exercise a spiritual jurisdiction in which she is responsible to her Divine Head alone, was both earnestly asserted and practically maintained. The first reformation extended from 1560, when the church freely held her first General Assembly, and of her own authority acted on the First Book of Discipline, to 1592, when her Presbyterian order was finally and fully ratified by the parliament. The second period began in 1638, when after 20 years of suspended animation, the Assembly once more shook off Episcopacy, and terminated in 1649, when the parliament of Scotland confirmed the church in her liberties in a larger and ampler sense than before. The third period began in 1834, when the Assembly made use of what the church believed to be her rights in passing the Veto and Chapel Acts. It culminated in the Disruption of 1843.

The fact that the church, as led first by Knox and afterwards by Melville, claimed an inherent right to exercise a spiritual jurisdiction is notorious. More apt to be overlooked is the comparative freedom with which that right was actually used by the church irrespective of state recognition. That recognition was not given until after the queen's resignation in 1567;[2] but, for several years before it came, the church had been holding her Assemblies and settling all questions of discipline, worship, and administration as they arose, in accordance with the first book of polity or discipline, which had been drawn up in 1560. Further, in 1581 she, of her own motion, adopted a second book of a similar character, in which she expressly claimed an independent and exclusive jurisdiction or power in all matters ecclesiastical, "which flows directly from God and the Mediator Jesus Christ, and is spiritual, not having a temporal head on earth, but only Christ the only king and governor of his church;" and this claim, though directly negatived in 1584 by the "Black Acts," which included an Act of Supremacy over estates spiritual and temporal, continued to be asserted by the Assemblies, until at last it also was practically allowed in the Act of 1592.[3] This legislation of 1592, however, did not long remain in force. An Act of Parliament in 1606, which "reponed, restored, and reintegrated" the estate of bishops to their ancient dignities, prerogatives, and privileges, was followed by several Acts of various subservient assemblies, which, culminating in that of 1618, practically amounted to a complete surrender of jurisdiction by the church itself. For twenty years no Assemblies whatever were held. This interval must necessarily be regarded from the Presbyterian point of view as having been one of very deep depression. But a second reformation, characterized by great energy and vigor, began in 1638. The proceedings of the Assembly of that year, afterwards tardily and reluctantly acquiesced in by the state, finally issued in the Acts of Parliament of 1649, by which the Westminster standards were ratified, lay-patronage was abolished, and the coronation oath itself framed in accordance with the principles of Presbyterian church government. Another period of intense reaction soon set in. No Assemblies were permitted by Cromwell after 1653; and, soon after the Restoration, Presbytery was temporarily overthrown by a series of rescissory Acts. Nor was the Revolution Settlement of 1690 so entirely favorable to the freedom of the church as the legislation of 1649 had been. Prelacy was abolished, and various obnoxious statutes were repealed, but the Acts rescissory were not cancelled; presbyterianism was re-established, but the statutory recognition of the Confession of Faith took no notice of certain qualifications under which that document had originally been approved by the Assembly of 1647;[4] the old rights of patrons were again discontinued, but the large powers which had been conferred on congregations by the Act of 1649 were not wholly restored. Nevertheless the great principle of a distinct ecclesiastical jurisdiction, embodied in the Confession of Faith, was accepted without reservation, and a Presbyterian polity effectively confirmed both then and at the ratification of the treaty of Union. This settlement, however, did not long subsist unimpaired. In 1712 the Act of Queen Anne, restoring patronage to its ancient footing, was passed in spite of the earnest remonstrances of the Scottish people. For many years afterwards (until 1784) the Assembly continued to instruct each succeeding commission to make application to the king and the parliament for redress of the grievance. But meanwhile a new phase of Scottish ecclesiastical politics commonly known as Moderatism had been inaugurated, during the prevalence of which the church became even more indifferent than the lay patrons themselves to the rights of her congregations with regard to the "calling" of ministers. From the Free Church point of view, the period from which the secessions under Erskine and Gillespie are dated was also characterized by numerous other abuses on the Church's part which amounted to a practical surrender of the most important and distinctive principles of her ancient Presbyterian polity.[5] Towards the beginning of the present century there were many circumstances, both within and without the church, which conspired to bring about an evangelical and popular reaction against this reign of "Moderatism." The result was a protracted struggle, which is commonly referred to as the Ten Years' Conflict, and which has been aptly described as the last battle in the long war which for nearly 300 years had been waged within the church itself, between the friends and the foes of the doctrine of an exclusive ecclesiastical jurisdiction. That final struggle may be said to have begun with the passing in 1834 of the "Veto" Act, by which it was declared to be a fundamental law of the church that no pastor should be intruded on a congregation contrary to the will of the people,[1] and by which it was provided that the simple dissent of a majority of heads of families in a parish should be enough to warrant a presbytery in rejecting a presentee. The question of the legality of this measure soon came to be tried in the civil courts; and it was ultimately answered in a sense unfavorable to the church by the decision (1838) of the Court of Session in the Auchterarder case, to the effect that a presbytery had no right to reject a presentee simply because the parishioners protested against his settlement, but was bound to disregard the veto (see CHALMERS, vol. v. pp. 326, 327). This decision elicited from the Assembly of that year a new declaration of the doctrine of the spiritual independence of the church. The "exclusive jurisdiction of the civil courts in regard to the civil rights and emoluments secured by law to the church and the ministers thereof" was acknowledged without qualification; and continued implicit obedience to their decisions with reference to these rights and emoluments was pledged. At the same time it was insisted on "that, as is declared in the Confession of Faith of this National Established Church, 'the Lord Jesus Christ, as King and Head of the church, hath therein appointed a government in the hand of church officers distinct from the civil magistrate;' and that in all matters touching the doctrine, discipline, and government of the church her judicatories possess an exclusive jurisdiction, founded on the Word of God, which power ecclesiastical" (in the words of the Second Book of Discipline) "flows immediately from God and the Mediator the Lord Jesus Christ, and is spiritual, not having a temporal head on earth, but only Christ, the only spiritual King and Governor of His Kirk." And it was resolved to assert, and at all hazards defend, this spiritual jurisdiction, and firmly to enforce obedience to the same upon the office-bearers and members of the church. The decision of the Court of Session having been confirmed by the House of Lords early in 1839, it was decided in the Assembly of that year that the church, while acquiescing in the loss of the temporalities at Auchterarder, should reaffirm the principle of non-intrusion as an integral part of the constitution of the Reformed Church of Scotland, and that a committee should be appointed to confer with the Government with a view to the prevention, if possible, of any further collision between the civil and ecclesiastical authorities. While the conference with the Government had no better result than an unsuccessful attempt at compromise by means of Lord Aberdeen's Bill, which embodied the principle of a dissent with reasons, still graver complications were arising out of the Marnoch and other cases, the nature of which has been briefly indicated in vol. v. as above.[2] In the circumstances it was resolved by the Assembly of 1842 to transmit to the Queen, by the hands of the lord high commissioner, a "claim, declaration and protest," complaining of the encroachments of the Court of Session,[3] and also an address praying for the abolition of patronage. The home secretary's answer (received in January, 1843) gave no hope of redress. Meanwhile the position of the evangelical party had been further hampered by the decision of the Court of Session declaring the ministers of chapels of ease to be unqualified to sit in any church court. A final appeal to parliament by petition was made in March, 1843, when, by a majority of 135 (211 against 76), the House of Commons declined to attempt any redress of the grievances of the Scottish Church.[4] At the first session of the following General Assembly (18th May, 1843) the reply of the non-intrusion party was made in a protest, signed by upwards of 200 commissioners, to the effect that since, in their opinion, the recent decisions of the civil courts, and the still more recent sanction of these decisions by the legislature, had made it impossible at that time to hold a free Assembly of the church as by law established, they therefore "protest that it shall be lawful for us and such other commissioners as may concur with us to withdraw to a separate place of meeting, for the purpose of taking steps for ourselves and all who adhere to us—maintaining with us the Confession of Faith and standards of the Church of Scotland as heretofore understood—for separating in an orderly way from the Establishment, and thereupon adopting such measures as may be competent to us, in humble dependence on God's grace and the aid of His Holy Spirit, for the advancement of His glory, the extension of the gospel of our Lord and Saviour, and the administration of the affairs of Christ's house according to His holy word." The reading of this document was followed by the withdrawal of the entire non-intrusion party to another place of meeting, where the first Assembly of the Free Church was constituted, with Dr. Thomas Chalmers as moderator. This Assembly sat from the 18th to the 30th of May, and transacted a large amount of important business. On Tuesday the 23d, 396[5] ministers and professors publicly adhibited their names to the Act of Separation and Deed of Demission by which they renounced all claim to the benefices they had held in connection with the Establishment, declaring them to be vacant, and consenting to their being dealt with as such. By this impressive proceeding, the signatories voluntarily surrendered an annual income amounting to fully £100,000.

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[1] "It is her being free, not her being established, that constitutes the real historical and hereditary identity of the Reformed National Church of Scotland." See *Act and Declaration*, etc., of Free Assembly, 1851.

[2] In the Act *Anent the true and holy Kirk, and of those that are declared not to be of the same*. This Act was supplemented by that of 1579, *Anent the Jurisdiction of the Kirk*.

[3] The Second Book of Discipline was not formally recognized in that Act; but all former Acts against "the jurisdiction and discipline of the true Kirk as the same is used and exercised within the realm" were abolished; and all "liberties, privileges, immunities, and freedoms whatsoever" previously granted were ratified and approved.

[4] The most important of these had reference to the full right of a constituted church to the enjoyment of an absolutely unrestricted freedom in convening Assemblies. This very point on one occasion at least threatened to be the cause of serious misunderstandings between William and the people of Scotland. The difficulties were happily smoothed, however, by the wisdom and tact of Carstares.

[5] See *Act and Declaration* of Free Assembly, 1851.

The first care of the voluntarily disestablished church was to provide incomes for her clergy and places of worship for her people. As early as 1841 indeed the leading principle of a "sustentation fund" for the support of the ministry had been announced by Dr. Candlish; and at "Convocation," a private unofficial meeting of the members of the evangelical or non-intrusion party held in November, 1842, Dr. Chalmers was prepared with a carefully matured scheme according to which "each congregation should do its part in sustaining the whole, and the whole should sustain each congregation." Between November, 1842, and May, 1843, 647 associations had been formed; and at the first Assembly it was announced that upwards of £17,000 had already been contributed. At the close of the first financial year (1843–44) it was reported that the fund had exceeded £61,000. It was participated in by 583 ministers; and 470 drew the full equal dividend of £105. Each successive year showed a steady increase in the gross amount of the fund; but owing to an almost equally rapid increase of the number of new ministerial charges participating in its benefits, the stipend payable to each minister did not for many years reach the sum of £150 which had been aimed at as a minimum. Thus in 1844–45 the fund had risen to £76,180, but the ministers had also increased to 627, and the equal dividend therefore was only £122. During the first ten years the annual income averaged £84,057; during the next decade £108,643; and during the third £130,246. The minimum of £150 was reached at last in 1868; and since then the balance remaining after that minimum has been provided has been treated as a surplus fund, and distributed among those ministers whose congregations have contributed at certain specified rates per member. In 1878 the total amount received for this fund was upwards of £177,000; in this 1075 ministers participated. The full equal dividend of £157 was paid to 766 ministers; and additional grants of £36 and £18 were paid out of the surplus fund to 632 and 129 ministers respectively.[1]

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[1] This principle had been asserted even by an Assembly so late as that of 1736, and had been invariably presupposed in the "call," which had never ceased to be regarded as an indispensable prerequisite for the settlement of a minister.

[2] According to the Free Church "Protest" of 1843 it was in these cases decided (1) that the courts of the church were liable to be compelled to intrude ministers on reclaiming congregations; (2) that the civil courts had power to interfere with and interdict the preaching of the gospel and administration of ordinances as authorized and enjoined by the church; (3) that the civil courts had power to suspend spiritual censures pronounced by the courts of the church, and to interdict their execution as to spiritual effects, functions, and privileges; (4) that deposed ministers, and probationers deprived of their license, could be restored by the mandate of the civil courts to the spiritual office and status of which the church courts had deprived them; (5) that the right of membership in ecclesiastical courts could be determined by the civil courts; (6) that the civil courts had power to supersede the majority of a church court of the Establishment in regard to the exercise of its spiritual functions as a church court, and to authorize the minority to exercise the said functions in opposition to the court itself and to the superior judicatories of the church; (7) that processes of ecclesiastical discipline could be arrested by the civil courts; and (8) that without the sanction of the civil courts no increased provision could be made for the spiritual care of a parish, although such provision left all civil rights and patrimonial interests untouched.

[3] The narrative and argument of this elaborate and able document cannot be reproduced here. In substance it is a claim "as of right" on behalf of the church and of the nation and people of Scotland that the church shall freely possess and enjoy her liberties, government, discipline, rights, and privileges according to law, and that she shall be protected therein from the foresaid unconstitutional and illegal encroachments of the said Court of Session, and her people secured in their Christian and constitutional rights and liberties. This claim is followed by the "declaration" that the Assembly cannot intrude ministers on reclaiming congregations, or carry on the government of Christ's church subject to the coercion of the Court of Session; and by the "protest" that all Acts of the Parliament of Great Britain passed without the consent of the Scottish church and nation, in alteration or derogation of the government, discipline, rights, and privileges of the church, as also all sentences of courts in contravention of said government, discipline, rights, and privileges, "are and shall be in themselves void and null, and of no legal force or effect."

[4] The Scottish members voted with the minority in the proportion of 25 to 12.

[5] The number ultimately rose to 474.

To provide for the erection of the buildings which, it was foreseen, would be necessary, a general building fund, in which all should share alike, was also organized, and local building funds were as far as possible established in each parish, with the result that at the first Assembly a sum of £104,776 was reported as already available. By May, 1844, a further sum of £123,060 had been collected, and 470 churches were reported as completed or nearly so. In the following year £131,737 was raised, and 60 additional churches were built. At the end of four years considerably more than 700 churches had been provided.

During the winter session 1843–44 the divinity students who had joined the Free Church continued their studies under Dr. Chalmers and Dr. Welsh; and at the Assembly of 1844 arrangements were made for the erection of suitable collegiate buildings. The New College, Edinburgh, was built in 1847 at a cost of £46,506; and divinity halls have subsequently been set up also in Glasgow and Aberdeen. In 1878 there were 13 professors of theology, with an aggregate of 230 students,—the numbers at Edinburgh, Glasgow, and Aberdeen respectively being 129, 69, and 32.

A somewhat unforeseen result of the Disruption was the necessity for a duplicate system of elementary schools. At the 1843 Assembly it was for the first time announced by Dr. Welsh that "schools to a certain extent must be opened to afford a suitable sphere of occupation for parochial and still more for private teachers of schools, who are threatened with deprivation of their present office on account of their opinions upon the church question." The suggestion was taken up with very great energy, and with the result that in May, 1845, 280 schools had been set up, while in May, 1847, this number had risen to 513, with an attendance of upwards of 44,000 scholars. In 1869 it was stated in an authoritative document laid before members of parliament that at that time there were connected with and supported by the Free Church 598 schools (including two normal schools), with 633 teachers and 64,115 scholars. The school buildings had been erected at a cost of £220,000, of which the committee of privy council had contributed £35,000, while the remainder had been raised by voluntary effort. Annual payments made to teachers, etc., as at 1869, amounted to £16,000. The total sum expended by the Free Church since the Disruption, for educational purposes, has been not less than £600,000. In accordance with certain provisions of the Education Act of 1872 most of the schools of the Free Church were voluntarily transferred, without compensation, to the local school boards.

It has been already seen that during the period of the Ten Years' Conflict the non-intrusion party strenuously denied that in any one respect it was departing from acknowledged principles of the National Church. It continued to do so after the Disruption. In 1846, however, it was found to have become necessary, "in consequence of the late change in the outward condition of the church," to amend the "questions and formula" to be used at the licensing of probationers and the ordination of office-bearers. These were amended accordingly; and at the same time it was declared that, "while the church firmly maintains the same scriptural principles as to the duties of nations and their rulers in reference to true religion and the Church of Christ for which she has hitherto contended, she disclaims intolerant or persecuting principles, and does not regard her Confession of Faith, or any portion thereof when fairly interpreted, as favoring intolerance or persecution, or consider that her office-bearers by subscribing it profess any principles inconsistent with liberty of conscience and the right of private judgment." The main difference between the "formula" of the Free Church and that of the Established Church is that the former refers to the Confession of Faith simply as "approven by General Assemblies of this Church," while the latter describes it as "approven by the General Assemblies of this National Church, and ratified by law in the year 1690, and frequently confirmed by divers Acts of Parliament since that time." The former inserts an additional clause,—"I also approve of the general principles respecting the jurisdiction of the church, and her subjection to Christ as her only Head, which are contained in the Claim of Right and in the Protest referred to in the questions already put to me;" and also adds the words which are here distinguished by italics,—"And I promise that through the grace of God I shall firmly and constantly adhere to the same, and to the utmost of my power shall in my station assert, maintain, and defend the said doctrine, worship, discipline, and government of this church by kirk-sessions, presbyteries, provincial synods, and general assemblies, *together with the liberty and exclusive jurisdiction thereof;* and that I shall, in my practice, conform myself to the said worship and submit to the said discipline [and] government, *and exclusive jurisdiction*, and not endeavor directly or indirectly the prejudice or subversion of the same."[2] In the year 1851 an Act and Declaration anent the publication of the subordinate standards and other authoritative documents of the Free Church of Scotland was passed, in which the historical fact is recalled that the Church of Scotland had formally consented to adopt the Confession of Faith, catechisms, directory of public worship, and form of church government agreed upon by the Westminster Assembly; and it is declared that "these several formularies, as ratified, with certain explanations, by divers Acts of Assembly in the years 1645, 1646, and particularly in 1647, this church continues till this day to acknowledge as her subordinate standards of doctrine, worship, and government."[3]

In 1858 circumstances arose which, in the opinion of many, seemed fitted to demonstrate to the Free Church that her freedom was an illusion, and that all her sacrifices had been made in vain. Mr. John Macmillan, minister of Cardross, accused of immorality, had been tried and found guilty by the Free Presbytery of Dumbarton. Appeal having been taken to the synod, an attempt was there made to revive one particular charge, of which he had been finally acquitted by the presbytery; and this attempt was successful in the General Assembly. That ultimate court of review did not confine itself to the points appealed, but went into the merits of the whole case as it had originally come before the presbytery. The result was a sentence of suspension. Mr. Macmillan, believing that the Assembly had acted with some irregularity, applied to the Court of Session for an interdict against the execution of that sentence; and for this act he was summoned to the bar of the Assembly to say whether or not it was the case that he had thus appealed. Having answered in the affirmative, he was deposed on the spot. Forthwith he raised a new action (his previous application for an interdict had been refused) concluding for reduction of the spiritual sentence of deposition, and for substantial damages. The defences lodged by the Free Church were to the effect that the civil courts had no right to review and reduce spiritual sentences, or to decide whether the General Assembly of the Free Church had acted irregularly or not. Judgments adverse to the defenders were delivered on these points; and appeals were taken to the House of Lords. But before the case could be heard there, the lord president took an opportunity in the Court of Session to point out to the pursuer that, inasmuch as the particular General Assembly against which the action was brought had ceased to exist, it could not therefore be made in any circumstances to pay damages, and that the action of reduction of the spiritual sentence, being only auxiliary to the claim of damages, ought therefore to be dismissed. He further pointed out that Mr. Macmillan might obtain redress in another way, should he be able to prove malice against individuals. Very soon after this deliverance of the lord president, the case as it had stood against the Free Church was withdrawn, and Mr. Macmillan gave notice of an action of a wholly different kind. But this last was not persevered in. The appeals which had been taken to the House of Lords were, in these circumstances, also departed from by the Free Church. It is perhaps to be regretted, from the legal point of view, that the case did not advance sufficiently to show how far the courts of law would be prepared to go in the direction of recognizing voluntary tribunals and a kind of secondary exclusive jurisdiction founded on contract.[1] But, whether recognized or not, the church for her part continued to believe that she had an inherent spiritual jurisdiction, and remained unmoved in her determination to act in accordance with that resolution "notwithstanding of whatsoever trouble or persecution may arise."[2]

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[1] Congregations, it ought to be noted, are permitted, and indeed expected, by collections or otherwise, each to "supplement" the income which its pastor derives from the general sustentation fund.

[2] It may be added that, while the Free Church requires elders to subscribe the same formula as ministers, the Established Church requires them to sign an older and shorter one.

[3] By this formal recognition of the qualifications to the Confession of Faith made in 1647 the scruples of the majority of the Associate Synod of Original Seceders were removed, and 27 ministers, along with a considerable number of their people, joined the Free Church in the following year.

In 1863 a motion was made and unanimously carried in the Free Church Assembly for the appointment of a committee to confer with a corresponding committee of the United Presbyterian Synod, and with the representatives of such other disestablished churches as might be willing to meet and deliberate with a view to an incorporating union. Formal negotiations between the representatives of these two churches were begun shortly afterwards, which resulted in a report laid before the following Assembly. From this document it appeared that the committees of the two churches were not at one on the question as to the relation of the civil magistrate to the church. While on the part of the Free Church it was maintained that he "may lawfully acknowledge, as being in accordance with the Word of God, the creed and jurisdiction of the church," and that "it is his duty, when necessary and expedient, to employ the national resources in aid of the church, provided always that in doing so, while reserving to himself full control over the temporalities which are his own gift, he abstain from all authoritative interference in the internal government of the church," it was declared by the committee of the United Presbyterian Church that, "inasmuch as the civil magistrate has no authority in spiritual things, and as the employment of force in such matters is opposed to the spirit and precepts of Christianity, it is not within his province to legislate as to what is true in religion, to prescribe a creed or form of worship to his subjects, or to endow the church from national resources." In other words, while the Free Church maintained that in certain circumstances it was lawful and even incumbent on the magistrate to endow the church and on the church to accept his endowment, the United Presbyterians maintained that in no case was this lawful either for the one party or for the other. Thus in a very short time it had been made perfectly evident that a union between the two bodies, if accomplished at all, could only be brought about on the understanding that the question as to the lawfulness of state endowments should be an open one. The Free Church Assembly, by increasing majorities, manifested a readiness for union, even although unanimity had not been attained on that theoretical point. But there was a minority which did not sympathize in this readiness, and after ten years of fruitless effort it was in 1873 found to be expedient that the idea of union with the United Presbyterians should for the time be abandoned. Other negotiations, however, which had been entered upon with the Reformed Presbyterian Church at a somewhat later date proved more successful; and a majority of the ministers of that church with their congregations were united with the Free Church in 1876.

The total income of the Free Church for the year 1877–78 was £575,718. This included (1) sustentation fund, £177,659; (2) local building fund, £99,480; (3) missionary and educational, £91,895; (4) congregational and miscellaneous, £190,775. Since 1843 an aggregate amount of nearly £13,000,000 has been raised. In 1878 the number of congregations was 997, with a total membership of 270,000. 1075 ministers participated in the equal dividend. There were also 59 missionaries employed at 21 principal mission-stations in India, Africa, Syria, and Polynesia.

Literature.—An authorized edition of the *Subordinate Standards* of the Free Church, including the *Claim of Right* and *Protest*, was published in 1851 in an easily accessible form, along with the *Act and Declaration* of that year. Of these "standards" (the Holy Scriptures being held supreme as the "rule of faith and manners") the most important is the *Confession of Faith*, which alone is imposed by subscription. The *Catechisms* (*Larger* and *Shorter*) are "sanctioned as directories for catechising;" and the *Directory for Public Worship*, the *Form of Church Government*, and the *Directory for Family Worship* are "of the nature of regulations rather than of tests." A practical application of the doctrine of the *Confession*, called the *Sum of Saving Knowledge*, is also included among the "standards." The general subject of Scottish church history is handled in a considerable number of well-known works, which need not be enumerated here. Among books professedly dealing with the Free Church question, the most valuable are Sydow's *Die Schottische Kirchenfrage* (Potsdam, 1845), and *The Scottish Church Question* (London, 1845); Buchanan's *Ten Years' Conflict* (1849); Hanna's *Life of Chalmers* (1852); and Taylor Innes on *The Law of Creeds in Scotland* (1867). See also Cockburn, *Memorials of His Time* (Continuation, 1874); Walker, *Dr. Robert Buchanan: an Ecclesiastical Biography* (1877); *Annals of the Disruption* (published by authority of a committee of the Free Church, 1876–77). (J. S. BL.)

FREEHOLD, in the English law of real property, is an estate in land, not being less than an estate for life. An estate for a term of years, no matter how long, was considered inferior in dignity to an estate for life, and unworthy of a freeman (see ESTATE). "Some time before the reign of Henry II., but apparently not so early as Domesday, the expression *liberum tenementum* was introduced to designate land held by a freeman by a free tenure. Thus freehold tenure is the sum of the rights and duties which constitute the relation of a free tenant to his lord."[3] In this sense freehold is distinguished from copyhold, which is a tenure having its origin in the relation of lord and villain (see COPYHOLD). Freehold is also distinguished from leasehold, which is an estate for a fixed number of years only. By analogy the interest of a person who holds an office for life is sometimes said to be a freehold interest. The term *customary freeholds* is applied to a kind of copyhold tenure in the north of England, viz., tenure by copy of court-roll, but not, as in other cases, expressed to be at the will of the lord.

FREE IMPERIAL CITIES is the ordinary English translation of *Freie Reichs-Städte*, a technical expression in German history. In Germany, as in other countries of Europe, a considerable number of towns succeeded, in the midst of the dynastic confusion of the Middle Ages, in maintaining or acquiring more or less complete independence of the state or sovereign within whose territory they were situated. This they effected partly by forming defensive leagues with each other, and partly by procuring, in return for service or money, privileges and protection from the successive occupants of the imperial throne. Of these free towns a certain proportion rose by commerce and industry to a position of great influence, and ultimately took rank along with kingdoms and principalities as integral members of the body politic of the empire. They first appear distinctly in this character in the reign of Henry VII. (1308–1313). Their number was continually fluctuating, for their liberties were almost as easily lost as they were with difficulty acquired. Most of them had to maintain a continual conflict by war or diplomacy with the ecclesiastical or secular potentates of their district, and not unfrequently their interests were betrayed by the emperors themselves. Mainz, which in the 13th century was at the head of the *Rheinisches Städtebund*, or confederation of the cities of the Rhine, was conquered in 1462, and subjected to the bishop's see; Zwickau, Altenburg, and Chemnitz, put in pawn first by Frederick II. and afterwards by several of the later emperors, thus fell into the hands of the dukes of Saxony; other free cities placed themselves of their own accord under the control of prince or bishop; some, as Donauworth, were deprived of their privileges by the emperors on account of real or alleged offences; others again were separated from the empire by foreign conquest, as Hainault or Hagenau, Colmar, Schlettstedt, Weissenburg, Landau, and Besançon by Louis XIV.; and Basel notably preferred to cast in its lot with the rising confederation of Switzerland. At the diet of Augsburg in 1474 the free imperial cities divided themselves for the first time into two benches, the Rhenish and the Swabian, the former also including those of Alsace, Wetterau, Thuringia, and Saxony, and the latter those of Franconia. They were formally constituted the third collegium of the diet by the peace of Westphalia in 1648. At the time of the French Revolution they still numbered 51,—the Rheuish bench comprising Cologne, Aix-la-Chapelle or Aachen, Lübeck, Worms, Spires, Frankfort-on-the-Main, Goslar, Bremen, Hamburg, Mühlhausen, Nordhausen, Dortmund, Friedberg, and Wetzlar; and the Swabian bench, Ratisbon or

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[1] See Taylor Innes, *Law of Creeds in Scotland*, p. 258 *seq.*

[2] The language of Dr. Buchanan, for example, in 1860 was (*mutatis mutandis*) the same as that which he had employed in 1838 in moving the Independence resolution already referred to.

[3] Digby's *History of the Law of Real Property*.

Regensburg, Augsburg, Nuremberg, Ulm, Esslingen, Reutlingen, Nördlingen, Rothenburg on the Tauber, Schwäbisch-Hall, Rothweil, Ueberlingen, Heilbronn, Gmünd, Memmingen, Lindau, Dinkelsbühl, Biberach, Ravensburg, Schweinfurt, Kempten, Windsheim, Kaufbeuern, Weil, Wangen, Isny, Pfullendorf, Offenburg, Leutkirchen, Wimpfen, Weissenburg in the Nordgau, Giengen, Gengenbach, Zell on the Hammerbach, Buchhorn, Ahlen, Buchau, Bopfingen. A large proportion of these towns had then at least as little claim to their exceptional position as the pocket-burghs of England before the passing of the Reform Act. By the decision of the imperial deputation of 1803 (*Reichsdeputationshauptschluss*) Cologne, Aix-la-Chapelle, Worms, and Spires were assigned to France; only six, Hamburg, Lübeck, Bremen, Augsburg, Frankfort-on-the-Main, and Nuremberg were allowed to retain their *Reichsfreiheit*, or, in other words, to hold directly of the empire. On the dissolution of the empire in 1806, Augsburg and Nuremberg were given to Bavaria, and Frankfort was made the seat of Count Dahlberg, the archbishop and electoral prince of Mainz, who was appointed primate of the confederation of the Rhine. On the establishment of the German confederation in 1815, Hamburg, Lübeck, Bremen, and Frankfort were recognized as free cities, and the first three still hold that position in the new German empire; but Frankfort, in consequence of the part it took in the war of 1866, has been degraded to the rank of an ordinary Prussian town.

In the earlier centuries of their existence the free cities of the empire were under the jurisdiction of two imperial officers, one of whom, the imperial advocate or *Reichsvogt*, took charge of criminal cases, and the other, the imperial procurator or *Reichs-Schultheiss* or *Schuldheiss*, dealt with the civil cases. As time went on many of the cities purchased the right of filling these offices with members of the principality; and in several instances the imperial authority fell practically into desuetude except when it was roused into action by peculiar circumstances, such as a dispute between the citizens and their magistrates. The internal constitution of the cities was organized after no common type; but there were several of them whose privileges were drawn up in imitation of those of Cologne, which had been one of the very first to assert its independence.

See J. J. Moser, *Reichsstädtisches Handbuch*, Tübingen, 1732; D. Hänlein, *Anmerkungen über die Geschichte der Reichsstädte*, Ulm, 1775; A. Wendt, *Beschreibung der kaiserl. freien Reichsstädte*, Leipsic, 1804; G. W. Hugo, *Die Mediatisirung der deutschen Reichsstädte*, Carlsruhe, 1838; Waitz, *Deutsche Verfassungsgeschichte*.

FREEMASONRY (*Fr.* Franc-maçonnerie, *Ger.* Freimaurerei) is the name given to that system of ritual and rules which Freemasons observe. It may also be applied to the masonic art, or the practice of masonic ritual and rule. The institution is not older than the beginning of the 18th century, but it has been lately said to include more than 10,000 lodges and more than 1,000,000 members. Before considering the history and actual position of the modern society itself, however, a few words are due to the really interesting and much-debated question of its origin and antecedents. It is, of course, easy to point out vague analogies between Freemasonry and the great secret organizations having social aims, which existed in antiquity. The Pythagoreans, the Eleusinians, the Essenes, and the Carmathites and Fedavi (the mystic Rationalists of Islam) have all been appealed to by uncritical masonic writers in the hope of giving to their craft the doubtful authority and prestige of ancient descent. If the resemblances were more numerous and striking than they are, they would not prove an historical connection between organizations so widely removed from one another in time, and they would admit of explanation by the general doctrine of psychical identity, one of the most important results of anthropological science. Besides this, the superficial resemblances are accompanied by radical differences. The mere conception of Freemasonry implies cosmopolitan brotherhood, and was therefore impossible in the ancient world. If indeed the genuine legends of the craft were followed, its origin would be traced to the creation, the flood, or at least the building of Solomon's temple. Accordingly, one of the most popular and voluminous masonic writers of the 19th century, the Rev. George Oliver, informs the world that Moses was a grand master, Joshua his deputy, and Aholiab and Bezaleel grand wardens. Again, a likeness, sometimes real and sometimes fanciful, between the sets of symbols and ceremonies used has led many writers to see an organic connection between Freemasonry and the Assassins, the Rosicrucians, the Templars, the Illuminati, the Carbonari, and the Hetairia, and other social and political secret societies, old and young, of the most widely differing aims. It is possible that Freemasonry copied an older ritual, which was again imitated by younger societies, who also endeavored to utilize masonic lodges as stations for proselytizing work. But these facts themselves show discontinuity of life. The true historical precursors of the modern fraternity of Freemasons were the mediæval building corporations. Of these the most distinctive type is to be found in the stone masons (*Steinmetzen*) of Germany. It is a further and more difficult question what were the relations between these mediæval societies and the Roman collegia not struck at by the law *De Collegiis Illicitis*, D. 47, 22. Krause in his *Die drei ältesten Kunsturkunden der Freimaurerbrüderschaft*[1] points out that these collegia had an exchequer, an archive, patrons, religious ceremonies, an oath, a benefit and burial fund, and a register. They had such officers as magistri, decuriones, tabularii, censores, and they instructed their apprentices to a certain extent in secret. No doubt such *sodalitia* existed for centuries in Gaul and Britain, and they may have deposited in the civilization of these countries some of their ideas and habits. Again, at a later period, there was a distinct invitation sent from the West to the building corporations of Byzantium; the movement westward was increased by the iconoclasm of Leo. But the European building societies were undoubtedly distinct growths. The *cæmentarii* or *liberi muratores* at first grouped themselves round the monasteries, especially of the Benedictine order. The abbots were in many cases the architects who employed the masons on ecclesiastical buildings and repairs. As architecture developed, and with increasing wealth the church gradually undertook larger and nobler works, these societies of craftsmen also assumed a more definite and more durable form. The taste and science of Gothic architecture were to a large extent the possession of the *Bauhütten*, or wooden booths where the stone-cutters during the progress of the work kept their tools, worked, held their meetings, and probably also took their meals and slept. In the 12th century there are distinct traces of a general association of *Bauhütten* throughout Germany, acknowledging one set of *Ordnungen* or craft laws, one set of secret signs and ceremonies (*Heimlichkeiten*) and to a certain extent one central authority in the Haupthütte of Strasburg.[2] Albertus Magnus (1205-1280) is supposed to have introduced many of the Jewish and Arabian symbols which were popular in the craft. The privileges which a *Bauhütte* was able to give to its masters, parlierer (speakers), and journeymen, were chiefly "a share in the administration of justice, in the election of officers, in the banquets, and in works of charity." The trade customs and symbolic forms of these associations have been described by Fallou in his *Mysterien der Freimaurer* (1859), Winzer in his *Deutschen Brüderschaften des Mittelalters* (1859), and Fort, *Early History and Antiquities of Freemasonry* (Philadelphia, 1877). The initiation is said to be copied from a Benedictine consecration. Instruction was given to all apprentices in both architecture and its allegory. When he had served his time and finished his "Wanderjähre," every man was entitled, if of good character, to receive the *Wortzeichen* or *der Gruss*. He took the oath of secrecy on the Bible, the compass, and the square, and drank the *Willkommen*. The three great lights,[3] the hammer or gavel, the gold, azure, and white colors, the sacred numbers 3, 5, 7, and 9, and the interlaced cords, all had their traditional meaning. The obligation to secrecy, however, probably applied to the apprentice even before initiation. See the *Constitutions of Masonry* (Halliwell's edition, l. 279-282)—

> "The prevystye of the chamber telle he no mon,
> Ne yn the logge whatsever they done;

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[1] See also Rebold, *Hist. Gén. de la Franc-maçonnerie*, 1851, of which there is an American translation by Brennan, Cincinnati, 1868.

[2] The importance of this was first pointed out in Abbé Grandidier's letter, which forms App. xvii. to De Luchet's *Essai sur la Secte des Illuminés*, Paris, 1789.

[3] These candles have been derived from the cabalistic triangle formed of the *Sephiræ*, splendors or attributes proceeding from the Yodh, the En-Soph, or central point of light (see Ginsburg *On the Cabala*). The masonic MS. attributed to Henry VI. refers to the faculty of Abrac, *i. e.*, of the adorable name worshipped by the Basilidian heretics.

> Whatsever thou heryst, or syste hem do,
> Tell hyt no mon, whersever thou go.”

It has been observed by Brentano,[1] that the working arrangements of the building trades at this time differed when a cathedral or palace was being built, the architect being then master of the lodge with foremen under him; and when a dwelling-house was built, the owner then engaging both masters and workmen. There was thus a nearer approach to the modern factory system; and in fact the well-known English statutes against combinations, congregations, and chapters of workmen (34 Edw. III. c. 9, and 3 Hen. VI. c. 1) were directed against the excessive wages of journeymen. The separate interests of this class found expression in the contemporary French institution of Compagnonnage.[2] The atmosphere of these societies seems, even at an early date, to have been favorable to liberty of thought and religious toleration. Hence they were prohibited by the council of Avignon in 1326. The authority of the *Haupthütte* was recognized at the great assemblies of Ratisbon and Strasburg in 1459, the statutes of which received imperial confirmation. It was legally destroyed by an edict of 1731, long before which time its practical vitality had ceased. England imported much of her lodge organization and learning from Germany. The York charter, on which she based her claim to a native system in the time of Athelstan, is a much later document. This charter contains the famous legend of the craft which derives the seven liberal sciences (masonry being a part of geometry) from the family of Lamech. This science, preserved on a stone pillar from the flood, was taught by Euclid to the Egyptians, and carried by Israel to the building of the temple. Maymus Græcus brought it to Charles Martel and to England. The early history of the English mason lodges has been illustrated by the works of Wm. J. Hughan,—*Constitutions of the Freemasons, History of Freemasonry at York*, etc.[3] The first instance of a gentleman or amateur being “accepted” is that of the antiquary Elias Ashmole (afterwards Windsor Herald under Charles II.), who, along with Colonel Manwaring, was entered at Warrington in 1646. The causes which led to the introduction of a new class of members, and gradually converted operative into speculative masonry, are well stated by Findel, the learned editor of the German masonic journal *Die Bauhütte*, whose *History of Freemasonry* (translated into English in 1869) is by far the most scientific and complete work upon the subject. In the first place the old secrets of Gothic masonry were rendered less valuable by the spread of Augustan and Renaissance architecture, which Inigo Jones and his patron Lord Pembroke had been studying on the Continent. Jones was patron of the Freemasons from 1607 to 1618. He invited several Italian artists to join the body. Then the disorder of the civil wars prevented meetings and broke up the masonic connection. Again the growing spirit of the Reformation in religion gave men a freedom of speech which superseded the marks and caricatures in which the old masons exposed the vices of the church. Toleration was soon a political fact. Science, too, took a new departure from the time of Bacon. The interrogation of nature was preferred to legend and allegory. At the same time a perfectly distinct current of ideas was originated by the Arabian mysticism of Paracelsus and Rosenkreuz, which, after being popularized on the Continent by one of its most decided opponents, Valentine Andreæ, was preached to the people of England by Robert Fludd in his *Tractatus Theologico-Philosophicus*. Works like Bacon's *New Atlantis* and Depuy's “History of the Condemnation of the Templars” (in his *Traitez concernant l'Histoire de France*, 1651) fostered the idea of a new humanitarian society, and at the same time suggested the adoption of ancient symbols of fellowship. The same thing is seen in the *Pantheisticon* of Toland. It was under the impulse thus communicated that a general assembly of masons was held in 1663, at which the old catechisms were revised, and a series of new statutes passed. The reconstruction of London after the fire, the building of St. Paul's, and the patronage of Sir Christopher Wren, kept up the interest in the movement; and at last a formal resolution was passed that the masonic privileges should no longer be confined to operative masons.

England.—Modern or speculative masonry may be said to have begun in London on June 24, 1717, “the high noon of the year, the day of light and of roses,” when the four London lodges, having erected themselves into a grand lodge, named their first grand master. The leading spirits in this revival were Desaguliers, the well-known popularizer of natural science, and James Anderson, a Scotch Presbyterian minister, who compiled the *Book of Constitutions*, containing the ancient regulations and charges of the craft. This book is quite uncritical. It is said that the mechanical tastes and the Huguenot principles of Desaguliers are both traceable in the subsequent organization of the society. From this time new lodges could be formed only by warrant from the grand lodge, but they were empowered to create masters and fellow crafts. In 1721 the duke of Montagu was elected grand warden. He was the first noble who obtained that office. In the strange society of Gormogones, subject to the “sub-œcumenical volgi” at Rome, it is supposed that the Jesuits made a final effort to secure English Freemasonry as a channel for their political influence. At this time, also, the committee of charity was formed, which has since raised and expended very large sums for the relief of distressed brethren, and built the boys' and girls' masonic schools at Battersea Rise and Tottenham. Provincial grand masters were appointed, and charters granted to many foreign lodges. In the latter part of the 18th century the ancient York Lodge, backed by several old masons who had been indulging in irregular initiations, put forward a rival claim to be grand lodge or supreme authority. This claim was rested on the fable of an assembly at York in the year 926. The York people had also a new ritual, described in the *Book of Laws or Ahiman Rezon*, and also in *Jachin and Boaz, The three distinct Knocks*, and *Hiram Adonham or the Grand Master Key*[4] (1762). On the orthodox or London side appeared the well-known *Illustrations of Masonry*, by Preston, the pupil of Ruddiman. The schismatics introduced the red color of the royal arch degree, which they represented as something more exalted than the blue degrees of St. John. It belongs to the order of Templars, the legend referring to the second building of the temple. Another branch of Templarism, the grand chapter of Harodim, was founded in London in 1787. Just at the end of the century the publication of Abbé Barruel's *Memoirs pour servir à l'histoire du Jacobinisme*, translated into English by Clifford (who applied his author's principles to the United Irishmen and other Corresponding Societies of the time) and of Professor Robinson's *Proofs of a Conspiracy*, translated into French and German, made Freemasonry the subject of considerable suspicion.[5] The Act of 1799 directed against seditious societies, however, makes an exception in favor of the masonic lodges, which, according to the Act, meet chiefly for benevolent purposes. In 1813 a union was at last brought about by the dukes of Sussex, Kent, and Athole between the rival grand lodges of London and York, henceforth known as the United Grand Lodge of England. This patronage of aristocratic blood gave an impetus to Freemasonry, and in 1832 Mr. Crucefix, the editor of the *Freemason's Quarterly Review*, succeeded in founding the Freemason's Asylum. The brotherhood showed their good sense in deciding about this time that Jews might become members of the craft. They also built a hall, established their archæological institute and “The London Literary Union,” and started the *Freemason's Magazine* and the *Freemason*, in which periodicals a record may be found of the most recent masonic opinion and history. Besides 60 provincial grand lodges and 1200 lodges, England has a grand chapter for the royal arch degree, a grand lodge for the mark masters, a grand conclave of the knights templars, and a superior grand council of the ancient and accepted rite of the 33 degrees.

Ireland.—The first Irish lodge of speculative masonry seems to have been opened at Dublin in 1730. The English constitutions were adopted wholesale. Nothing of interest occurs in the Irish history. A characteristic liking is shown for the most sonorous of the high degrees:—the knights of the sword, the east, and the sun, the rosicrucian or mason prince, the kadosh or philosophical mason, and the grand general inspector. Power to grant these degrees was absurdly enough obtained from "Mother Kilwinning," a Scotch lodge which has always laid claim to a fabulous antiquity. The disputes between the grand chapter and grand consistory of Dublin have been frequent and violent. Ireland has now 350 lodges. The grand lodge, which supports two orphan schools, has an income of about £4000. A statement of the Ultramontane argument in modern Ireland will be found in Gargano's *Irish and English Freemasons*, Dublin, 1878, which is largely founded on Mgr. Dupanloup's *Study of Freemasonry* and *Secret Warfare against Church and State*. Gargano strongly urges the injustice done by the secret preference given by masons to one another in the ordinary civil and commercial relations of life. His book also contains an explanation of the pass-grip and real-grip for the three ordinary degrees, and for the mark master, the royal arch, and the knight templar, and a minute description of the modern initiation, with the text of the oaths.

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[1] *History and Development of Guilds*, London, 1870, p. 80.

[2] C. G. Simon, *Étude historique et morale sur le Compagnonnage*, Paris, 1853.

[3] See also Dallaway, *Historical Account of Master and Freemason.*

[4] The Jewish legend of the assassination of and search for Hiram, which still appears in the business of a lodge, resembles the Scandinavian story of Baldur.

[5] The earliest book of this class was Abbé Larudan's *Franc-maçon Écrasé*, 1746.

Scotland.—In Scotland the history of Freemasonry closely resembles what took place in England. Before the 16th century there is not much trace of special legislation about masons.[1] Like the other crafts they enjoyed, under the Act of 1424, the right of nominating their own deacon or master-man. The deacon gave place to the warden, who represented rather the public than the trade interest. In 1493 the masons and wrights are denounced as oppressors of the lieges, because they had agreed that "they sall have fee alsweill for the haile day as for the wark day," and "that quair ony begiennis ane mannis warke ane uther sall not end it." A severe blow was struck against their privileges by an Act of 1540, which rendered legal the employment of unfreemen builders, but Queen Mary restored the jurisdiction from the trade visitors to the deacons, and confirmed their ancient right of self-regulation. In 1598–99 we have the celebrated statutes and ordinances to be observed "by all master masons, set down by William Shaw, master of work to his majesty, and general warden of the craft." These documents, one of which was preserved in the charter chest of the Eglinton family, are printed in Mr. Murray Lyon's learned *History of Freemasonry in Scotland*, Edin., 1873. They are confined to trade regulation, and do not deal with benefits. They fix the number of apprentices, the examination on entrance, the subscription to the box, the election of officers, provision for the safety of craftsmen, etc. The "Old Buik" of the Kilwinning Lodge was not really a Scotch document. It was a version of the English masonic legend and charges. The ceremony of initiation was at this time very simple; but the speaking plack, the dinner, and the pitcher of ale were exacted. The system of degrees was not developed. There was probably a pass-word, such as the squaremen word used in the "brithering" of the wrights and slaters. The individual "marks" chosen by entrants were carefully registered, but they did not indicate status. The mark degree, revived in 1869, and made the subject of a conference in 1871, was not known before 1789. In fact, the apprentices were originally present at and concurred in most of the business of the lodge. This word "lodge" occurs for the first time in a "statute anent the government of the master mason of the College Kirk of St. Giles," 1491, which is to be found in the burgh records of Edinburgh. It would appear that the deacon of the civil trade incorporation was often *ex officio* head of the lodge. The quartermaster and the intender or instructor were also officers in the old lodge. *Cowans, i.e.*, strangers, were stringently provided for in Shaw's *Statutes*. The traces of female membership are explained by the custom of the widows and daughters of freemen being admitted, at least to finish the contracts of the deceased. The Hay MSS. in the Advocates' Library contain two charters or letters of jurisdiction, dated in 1601 and 1628, by the freemen masons and hammermen in favor of the St. Clairs of Rosslyn, in virtue of which the head of that family for a long time acted as the patron, protector, and judge of the early masonic lodges. This has sometimes been inaccurately represented as a heritable conveyance of a grand mastership. As in England, there are traces of amateurs or non-operative members being gradually admitted to full privileges even in the 17th century, though such persons were charged higher entrance fees. This was called the theoric or geomatic as opposed to the domatic or operative element. Boswell of Auchinleck was a member so early as 1600. The first years of the 18th century were marked by movements of insubordination among the journeymen, who considered themselves entitled to a larger share of control over the common purse. The original theory of the lodge was that only masters, and not fellowcrafts or apprentices, were members. In 1721 the enthusiastic Desaguliers appeared in Edinburgh; and on November 30, 1736, the first general assembly of symbolical masons was held, and a grand lodge for Scotland formed. The representative of the St. Clair family then resigned his hereditary office and was elected first grand master. St. Andrew's day was substituted for the day of St. John the Baptist. Provincial grand masters were soon added, and there was a general adhesion of Scotch lodges to the new organization. The subsequent history of the brotherhood is not eventful. In Scotland they have been more remarkable for conviviality, or "refreshment," as it is technically called, than for comprehensive charity. Their gloves, aprons, sashes, and jewels are well known in festival or funeral processions. Their political relations have been peaceful. In 1757 the Associate Synod excommunicated all persons taking the secret oath, but this was only a part of the general defiance which Cameronianism gives to civil duty. In 1800, when intercourse with some Irish regiments had introduced the templar degrees to some of the Ayrshire lodges, an attempt was made by the law officers of the crown to convict certain templars at Maybole of sedition and the administration of unlawful oaths. The case only resulted in the disclosure of the extremely absurd ceremonies connected with the two degrees of this royal order, viz., Heredom of Kilwinning and Rosy Cross. One of them consisted in drinking porter out of a human skull. Again, when political feeling ran high at the beginning of the present century, the authority of the grand lodge was seriously shaken by the revolt of the associated lodges headed by Canongate Kilwinning. The Court of Session, Lawson *v.* Gordon, July 7, 1810, F. C., refused to recognize a masonic lodge as a corporation, and in another case they rejected the argument that lodges certified by the grand lodge were alone entitled to the protection of the excepting clause in the Act of 1799. The quarrel was speedily arranged. In 1811 a supreme grand royal arch chapter of Scotland was founded at Edinburgh, but its degrees were denounced and have never been recognized by the grand lodge. Scotland has altogether 400 lodges.[2]

France.—The astronomer Lalande, in his article on this subject in the *Encyclopédie*, says that the first masonic lodge in France was founded by Lord Derwentwater at Hurre's Tavern, Paris, in 1725. The movement was at first largely patronized by the nobility. Louis XV. attempted to suppress it in 1737, and next year Clement XII. issued the bull *In Eminenti*, which denounces the *liberi muratori* and all secret societies, as the council of Trent had done before (xxv. c. 20). It is amusing to trace through the later bulls the inflated phrase of papal indignation,—*Providas* issued by Benedict XIV. in 1751, which, oblivious for the moment of the Society of Jesus, says, "honesta semper publica gaudent;" *Ecclesia a Jesus*, by Pius VII. in 1814, which refers especially to the Carbonari; *Quo Graviora*, by Leo XII. in 1826, which mourns over the corruption of the universities; and *Quanta Cura* by Pius IX. in 1864, which says, briefly but emphatically, *damnantur clandestinæ societates*. In France the tone of masonry was low. Admissions were sold at a fixed price without inquiry as to character. Salé invented a Freemason's dance for six. The order of *La Felicité* was disorderly; and the *Mopses* was invented to evade the papal prohibition. The Chevalier Ramsay in his *Relation Apologique* introduced the nonsensical *hauts grades*, with *novices*, *profès*, and *parfaits*, which he said were derived from the knights St. John of Malta, and had been preserved by "Mother Kilwinning." All this was probably a Jacobite propaganda. The nine high degrees, including Irish architect and Scotch apprentice, though discountenanced by the *Grande Loge Anglaise de France* in 1743, became very popular. The *Parfait Maçon* was published in 1744, and next year the *Maçonnerie Adonhiramique Devoilée* disclosed the intricacies of the "strict observance." There is a tradition that Prince Charles Edward himself founded the *Chapitre Primordial de Rosecroix* at Arras. The Clermont ritual, which was elaborated under Jesuit influence, added three French degrees, which were founded on the story of the templars having taken refuge from the persecution of Philip IV. in the island of Mull. One of these degrees was *Chevalier de l'Aigle Élu*. In 1766, under the auspices of a new *Grande Loge Nationale* of France, afterwards called the *Grand Orient*, a representative system was at last adopted in which the "Souverain Conseil" was merged, and some degree of subordination among the various lodges was obtained. The confusion at this time between Dresden and Scotch rituals, between the old and simple forms of St. John and the wildest complications of Rosicrucian superstition, was increased by the appearance of Cagliostro and other systematic impostors. Cagliostro, as every one knows from Carlyle's famous essay, was the *Grand Cophta*[1] of the Egyptian system, a product of his own fertile brain. With the view of weeding the brotherhood of such rascals, the *Grand Orient* in 1777 introduced the *Mot de Semestre*, or biennial pass-word. The rivalry of such romantic systems as Martinism[2] was still, however, keenly felt, and in 1781 the Grand Orient adopted four of the higher degrees, viz., *élu*, *chevalier d'orient*, *écossais*, and *chevalier rosecroix*. All this while an active hostility was kept up between the Orient and the original Grand Lodge, each of which was supported by a separate Rosicrucian organization besides its own proper lodges. The work of both was suspended during the Revolution, but in 1799 a national union was effected by Roettiers. No sooner, however, was this done, and the statutes, originally based on the English constitutions, thoroughly revived, than French masonry again suffered from an invasion of mysticism,—first, in the form of the Scottish Philosophic Rite (including such profundities as the luminous ring and the white and black eagle), and, secondly, in the American Ancient and Accepted Scotch Rite of 33 degrees, which the charlatan De Grasse-Tilly expounded with great success, but which in 1804 was amalgamated with the *Grand Orient*, the great marshals Masséna and Kellermann being then the leading members of the two bodies. The union did not last, as Napoleon disliked the constitution of the *Suprême Conseil*, which was largely influenced by the aristocracy. His brother Joseph, assisted by Murat and Cambacérès, was allowed to take office in the older organization. An order of templars appeared in 1804, and was followed by the absurd *Rite Misraim*, which contains 90 degrees of the most fantastic kind. The French clergy in their denunciations of Freemasonry set an example of bigotry, which the masons themselves followed in their treatment of Clavel, author of *Histoire Pittoresque de la Franc-maçonnerie*, one of the few rational books on the subject in the language. During the reactionary Catholic policy of the grand master Murat the younger (1852-62), the liberties of the *Orient* were greatly interfered with and its funds almost exhausted. Since then it has slowly recovered. It has now 292 lodges; and the *Suprême Conseil*, which has become more democratic in constitution, has 50. The *Grand Orient* has lately ceased to require belief in a personal God as a test of membership.

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[1] As may be seen from the "marks" on Melrose Abbey, the older Scotch churches owe much to the skill of the Frenchman John Moreau and other foreign masons.

[2] An insight into the practical working of Freemasonry in Britain may be got from Oliver's *Institutes of Masonic Jurisprudence*, London, 1859, and from the other works of that prolific author. The *Freemason's Magazine and Masonic Mirror* is published weekly.

Space does not admit of a detailed description of the advances of Freemasonry in other parts of Europe and in America. In Germany, where the chief lodge at Berlin is known as the grand royal mother lodge, *Zu den drei Welt-Kugeln*, it was patronized by Frederick the Great, and opposed by Maria Theresa. Its relations with the illuminati of Weishaupt are of extreme historical interest; and the question of the higher degrees was discussed at the great conference of Wilhelmsbad in 1782. The cause was helped by the adhesion of such great men as Lessing in his *Ernst und Falk, Gespräche für Freimaurer;* Herder in his *Adrastea;* Fichte in his *Briefe an Constant* and *Eleusinians of the 19th Century;* and Goethe, who wrote several masonic songs, and whose *Wilhelm Meister* is a favorite book among the craft. Germany has now 314 lodges, some of them, however, under the Swedish rite. The critical history of the institution and much of its general literature has been written there. The chief historians are Schröder, Krause, Fessler, and Findel. Kloss has published a bibliography which is supplemented by the American Barthelmess and by Findel. Marbach, Ritterhaus, and Löwe are the poets of the order in Germany, as Morris is in America. One of the most recent German publications is *Sarsena, oder der Vollkommene Baumeister*, Leipsic, 1874. As regards America it is sufficient to refer to the great anti-masonic movement of 1826, which was caused by the kidnapping and supposed murder by masons of a man called Morgan of Batavia, and which continued for some time to influence the presidential elections. Convictions for abduction were obtained. There have for more than a century been negro lodges in the United States. In Brazil in 1876 the hostility between masonry and the Catholic Church was shown in the production of the play *Os Mason e os Jesuitas*, in which the dishonesty of the priest is contrasted with the manly virtue of the mason.

As regards the future of Freemasonry, it is impossible, at least for outsiders, to say much. The celebration of the brotherhood of man, and the cultivation of universal good-will in the abstract, seem rather indefinite objects for any society in this unimaginative age. There is, on the one hand, a tendency to degenerate into mere conviviality; while, if schools, or asylums, or other charities are supported, to that extent of course the society becomes local and even exclusive in its character. In the mean time, masonry is to blame for keeping afloat in the minds of its members many of the most absolutely puerile ideas. A more accurate knowledge of its own singular and not undignified history would tend more than anything else to give worth and elevation to its aims. No one now believes the stupid slander that freemasons are engaged in any definite conspiracy against the state, religion, or social order. There is, however, something in their fundamental principles, the fraternity of men and their indifference to theological belief, and also in their recent movements, which perhaps justifies the suspicion, and even hatred, with which they are regarded by the Ultramontane party. Masonry in each country of course takes its coloring from the state of thought and feeling by which it is surrounded. But it cannot be disputed that the German, Dutch, Belgian, and French magazines of the craft occasionally exhibit a tone which is not favorable to Christianity regarded as a special revelation. The tendency of political opinion in such an association is also necessarily democratic; and while it would be absurd to make the brotherhood answerable for the opinions of Mazzini or the outrages of the commune, and while the majority of brethren are loyal subjects, and probably also orthodox Christians (in the theological sense), the institution itself undoubtedly "makes for" liberty in matters both civil and spiritual.

The singular myth that modern freemasonry is derived through Scotland from the historical order of the Templars has been treated in great detail and finally destroyed by Wilcke in his *History* of the Order, 2 vols., Halle, 1860. The claim was rested on (1) the *Charta transmissionis* or *tabula aurea Larmenii*, alleged to have been written in 1324 by Larmenius, the successor of grand-master Molay, who suffered in the persecution; (2) an old parchment copy of Templar statutes; (3) several alleged relics of the martyred Templars—all preserved in the archives of the Masonic Templars at Paris. An abstract of the controversy will be found in the appendix to Findel's *History*, which also contains the form of examination of a German Steinmetz, the Constitutions of the Masons of Strasburg (1459), including the Statutes of Parlierers and Fellows, and the Regulations of Apprentices; the Examination of the English Masons; a series of the old English Charges or Exhortations; the General Regulations of 1721; and the spurious Cologne Charter. The appendix of Mr. Fort's work contains the *Règlements sur les Arts et Métiers de Paris*, of the 13th century, as collected by Étienne Boileau, provost under Louis IX. The masonic legend of *Die heiligen vier Gekrönten* is supposed to relate to the martyrdom, in the time of Diocletian, of four stonecutters named Claudius, Nicostratus, Sinforiamus, and Simplicius, to whose memory the small church *Quattro Santi Coronati* at Rome was sacred. In the second part of Mr. Fort's work will be found an accumulation of interesting facts relating to the early organization of masonic societies, their ceremonies, crypts and lodges, or places of meeting, and costumes; the payment of wages by warden, and the power of superintendence by master; the symbolic meaning of the hammer, the columns, the cord, the shoe; and the various uses of marks.

The word freemason has been derived from the Norman

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[1] See Goethe's comedy of this name.

[2] Martin was connected with the *Chevaliers Bienfaisants*, *Amis Réunis*, and *Philosophes Inconnus*. He was a disciple of Jacob Boehme, and believed masonry to be divinely inspired. The system resembled that invented by the *Philalèthes*, of which Court de Gebelin, the Camisard historian, was a member.

French *Frère Maçon*, brother mason, and also from the expression freestone mason. The origin of the word mason is itself uncertain. The low Latin *macio* may be the German *Metz;* but Diez regards it as a modification of *marcio*, from *marcus*, a hammer. Littré suggests that the Latin *maceria*, a stone wall, may contain a radical *mac*, from which *macio* has been formed. This is rendered more probable by the Italian *macine* or *macigno*, a stone lap mill, where the root idea of mace or hammer, used for pounding corn, is referred to. Tiler, the name of a masonic officer stationed at the door of the lodge, obviously comes from *tailleur de pierre*, the lapidicine of several mediæval charters.

(W. C. S.)

FREEPORT, a city of Illinois, United States, the capital of Stephenson county, is situated on the Pekatonica river, 110 miles W.N.W. of Chicago. It is a rapidly increasing town, and possesses woollen and carpet manufactories, a foundry, a tannery, a beet-root sugar factory, and various kinds of agricultural instrument factories. The principal buildings are the court-house and the Presbyterian college, which was instituted in 1872. The population in 1850 was 1436, and in 1870, 7889.

FREETOWN, a town of West Africa, capital of the British colony of Sierra Leone, stands on the south side of the estuary of the Sierra Leone river, about 5 miles from the cape of that name in 8° 29′ N. lat. and 13° 10′ W. long. It is situated on a plain which slopes up gradually from the river, and is closed in behind by a succession of wooded mountains. The town is divided into several quarters, the best of which is inhabited by Europeans, half-castes, and immigrants, who are either tradesmen or artificers, and the remainder solely by the black population, who congregate together in separate tribes. From the fact that both the houses in the best quarter and also the negro huts are surrounded by a court-yard or garden, the town covers an unusually large amount of space for the number of its inhabitants. The decomposed vegetable matter which is carried down the river, and driven back to the town by the tide, renders it very unhealthy, and unsuited for European residents, of whom there are only a small number. Freetown is the chief seat of the Sierra Leone trade, and a considerable sum of money has lately been expended on the construction of a new wharf. The principal buildings are the governor's residence and government offices, the barracks, the cathedral, the missionary institutions, and the grammar school. About two miles above Freetown, at Fourah Bay, the English Church Missionary Society has its principal West-African College, built in 1840, the ground having been purchased in 1827, and the work commenced in a temporary building. In 1876 the college was reorganized and affiliated to Durham university. The population is about 18,000.

FREE TRADE. This expression has been appropriated, in a somewhat technical manner, to denote an unimpeded intercourse between such manufacturing and commercial communities as, having reciprocal interests, are under separate governments, and thereupon have separate financial systems. Thus the term is not applied to the facilities which town and country, laborer and capitalist, have obtained for reciprocal exchange, though these facilities have been acquired only in comparatively recent times. It is not used to describe the commercial intercourse of the three kingdoms, though restraints on the trade between Scotland and Ireland on the one side and England on the other were remitted, long after a political union between the three kingdoms had been effected, very grudgingly and very cautiously. Again, if we speak of free trade in land or free trade in banking, we use the term in a different sense from that in which it has been employed since the time of Adam Smith. But the phrase is technically used to designate such a commercial intercourse between any particular country, its colonies, and foreign countries, as gives the maximum of facilities for reciprocal exchange, and in the least degree attempts to make a fiscal system the means for stimulating and assisting domestic industry by protective enactments.

Free trade in the sense given to it above is advocated on two principal grounds, the one economical, the other political; and all arguments alleged in favor of it can be brought under one or other of these topics. It is resisted similarly for economical and political reasons,—not, indeed, in contradiction to those which are adduced in its favor, for these are absolutely irrefragable, but on the grounds that the industries of a country ought not to be defined by merely economical reasons, and that there are political interests which will not indeed annul, but must materially modify the universal and undeviating application of the free-trade principle. It will be the object of the present article to give a brief account of the controversy between the advocates of commercial freedom and those of commercial restraint, and to show how events, due to opinions which have long become obsolete, have strengthened the position of those who urge that the restraint of trade is and should be part of the function of Government. It is perhaps necessary, however, to meet an objection at once which might be taken, if it were not anticipated. Every civilized Government rightly and properly undertakes the supervision of contracts,—prohibiting some altogether, regulating others with less or greater strictness, and assuming the right to give an equitable interpretation to all; the application of the principles of equity to contracts being the most important improvement which modern civilization has induced on jurisprudence. Thus the law of civilized nations forbids any contract which would reduce one of the contracting parties to permanent slavery, though it compels the fulfilment of bargains which involve the temporary servitude of one of the parties. Again, it nullifies immoral bargains, though it does not profess to follow the consequences which a bargain that is *prima facie* innocent may have. Again, it subjects some callings to a police, either by exacting, in the case of certain professions, evidence of the individual's capacity, or by guarding continuously against any abuse which may arise from the exercise of a calling specially open to abuse, as in the case of houses for public entertainment, and the issue of paper money by banks. Furthermore, it subjects even simple contracts to revision—as, for example, cases in which exorbitant charges are made for loans. In these instances, and in others like them, a Government is only carrying out its primary duty in protecting its people from force or fraud, by controlling the free action of those who may inflict a serious injury on others. To define the extent indeed, to which such interference is necessary or desirable, is one of the hardest questions in what may be called the casuistry of politics. A country may be so over-governed by a watchful administration as to lose, to a greater or less extent, the spirit of enterprise or initiation, and thereby to be weakened in the legitimate rivalry of nations. But, on the other hand, it may be still more seriously weakened by the destruction of credit or confidence,—a result which is very likely to ensue when fraud is successful and unpunished.

Similarly a Government may control or prohibit intercourse between nations. If individuals have rights at all, one of the most obvious and important of these rights is that of choosing a market for their labor. But a Government would be admittedly justified in prohibiting the emigration of such artisans as are employed in the manufacture of munitions of war to a country with which itself was at war. It does more when it does not allow its harbors to be a refuge or a market for belligerents' ships, and prevents private individuals from supplying munitions of war to combatants. *A fortiori*, it would not allow its subjects to sell such goods to its enemies as might enable those enemies to protract their defence. It is a question whether it is not entitled to prohibit, or at least restrain, the exportation of that over which it is able to exercise a monopoly, though it is very seldom, if, indeed, it is ever the case, that any country is in so advantageous a position. And, lastly, it is allowed that a Government may make the commercial intercourse of its subjects a matter of bargain with the Government of other countries, though such expedients, from an economical point of view, have been subjected to very adverse criticism. Free trade, then, must be innocuous and not hostile to the general public good.

Between nations, free trade represents the well-known principle of the Division of Employments. The advantages which result from the natural or spontaneous division of employments, and the loss which ensues from a forced division of employments are the commonplaces of economists. But the fact that exactly the same principle rules the distribution of production over such parts of the world as are occupied by industrial agents is not so frequently insisted on. That there are several commodities which a country cannot produce at all, or can only produce under circumstances so disadvantageous as to involve disproportionate expense or loss, is admitted by every Government, however anxious it may be to develop native industry by protective regulations. No European Government, however imperfectly civilized, would attempt to direct its home industries into the production of tea, coffee, and chocolate, or to domesticate elephants for the sake of their ivory, or to breed ostriches for the sake of their plumes, or to maintain a race of wild hogs in order to obtain a due supply of bristles from native sources. But there are in most countries a number of industries the continuity of which Governments have attempted, and still attempt, to promote, by hindering the free entrance of foreign-made articles of the same kind. It will be found that, historically, this practice has had its origin in what is now understood to be a delusion as to the true functions of the currency.

The restraint of production and trade was a policy which ancient civilization never adopted. The great statesman of Athens congratulates his audience on the fact that, thanks to the extended commerce of their country, they are as familiar with the use of foreign products as they are with those of domestic industry, and use them even as freely as the country of their origin does. The public opinion of Greece was profoundly shocked when, as a measure of political animosity, Athens excluded a Greek city, Megara, from its market. The oldest public document preserved in the Roman archives was a commercial treaty with Carthage (Polybius, xii. 22), in which Roman merchants are indeed restrained from traffic in certain districts, more, we may be certain, from fear of the Carthaginian occupation of Italy than for other reasons, for the treaty expressly exempts traffic from tolls, and prescribes that Carthage shall build no factories in Latium. Nor is there any record of restraint put upon the distribution of the precious metals, except in one oration of Cicero, where the orator, defending his client from a charge of extorting money from the Asiatic Jews, comments on the public policy of hindering this people from disturbing the money market by sending great remittances of specie to Jerusalem.

Perhaps the explanation of the fact that the civilization of antiquity did not interfere with the process of international exchange is to be found in the prevalence of slavery. Setting aside for a moment the historical origin of modern protection, the influence and apparent truth of the mercantile system of which we shall speak immediately, there is a radical difference between ancient and modern civilization,—that in the former slavery was deemed natural, in the latter it has been seen to be mischievous and felt to be detestable. In modern societies, therefore, the free laborer is a factor in the interpretation of economical forces; in ancient ones he counted for nothing, or next to nothing. To have prohibited free trade in the products of foreign labor at Athens would have been to give advantage to one class of slave-holders in opposition or in contrast to another class of slave-holders, and was not to be thought of. To prohibit free trade between England and France, or England and the United States, is, in appearance at least, to assist the home labor of the country which adopts protection against the rivalry of free labor in another country which might undersell its rivals. Protection in ancient times would have been seen to be naked selfishness; in modern times it may seem to be a genuine and disinterested patriotism. And it may be observed that, for this and for other reasons, most slave-holding countries have been indifferent to protective regulations, or even unfriendly to them. This fact is sufficiently illustrated by the contrast of opinion in the northern and southern States of the American Union before the war of secession.

The control of production and trade in modern Europe is historically due to the development of what Adam Smith called the Mercantile System, *i.e.*, the effort of Government to secure as far as possible the largest possible amount of specie within the country whose affairs it administered. It is easy to discover the origin of this policy. To a Government which spends, but does not produce, the possession of treasure is of the greatest utility and service. To an individual who produces and trades, still more to one who trades only, treasure is, as a rule, the least valuable instrument of traffic, as it is an article from which, as it is affected by the least possible variation in value, the least amount of profit can be anticipated by those who deal in it as an article of trade. A trader in the Middle Ages would have readily accepted the doctrine that money was wealth as far as regarded every one but himself; as far as he was concerned, he wished to get rid of his money as soon as he could, in exchange for goods, on which he might secure his profits. The doctrine that the machinery of international trade supplied the process by which the precious metals were distributed, and that therefore, if trade were to exist, the attempts of Government to restrain the exportation of money were mischievous or nugatory, was argued as early as the middle of the 14th century by Sanuto the Venetian, and by Oresme the bishop of Lisieux, in language as precise as any used by Turgot or Adam Smith. The reasonings, however, by which protective theories were upheld, the mean and malignant arguments of restraint, as Adam Smith calls them, were always strengthened in England up to thirty years ago, by suggesting the hideous consequences which would come on the nation from a drain of gold. Protection had its origin in the reputed duty of Government towards the currency. Once established, it created artificial interests whose existence was a loss to the whole community, but whose maintenance seemed to be the satisfaction of a contract entered into between the Government and the industry which the Government had called into being or had stimulated.

It will be clear that if any particular industry is of such a character as to be very conveniently carried out by the inhabitants of a particular community or district, if the producer fears no rival in the home market, and still more if he dreads no competition in a foreign market, any protection accorded to his industry must be wholly superfluous. He might even contemplate an export duty with equanimity, though of course an export duty would be destructive of his foreign market if he had real rivals, and he would generally find that such a duty would not only limit the consumption of his produce, but would call a rivalry into existence. It is equally clear that if a protective duty were imposed on the importation of foreign commodities into a country which has already a marked superiority over other countries in these commodities, the regulation would have no effect in increasing either the profits of the producer or the cost of the article to the consumer,—that, in short, the enactment would be absolutely nugatory. It will be also plain that, in every country, there are certain commodities which are effectually shielded from foreign rivalry by the cost of carriage, and that such commodities possess the superiority which other products enjoy from the peculiar facilities which a particular country has in manufacturing them. A protective system then is inevitably concerned with such products as are liable to foreign rivalry, and a foreign rivalry can only be defeated at the cost of the consumer. But as the protective regulation can affect prices in that country only which imposes the regulation, it is obvious that the only person who can be made to bear the increased cost which the protective restraint imposes will be the home consumer. If the produce could find a market at home, there would be no need of the assistance; if it cannot subsist at home without a machinery which guarantees the profit of the producer, the domestic consumer is the only person who can be made to contribute the fund from which the profit is made.

The positions stated above receive a significant but complete illustration from the economical history of England. A century ago the English landowners were free traders, the English merchants protectionists. Adam Smith rested all his hopes of a better system on the former class, but despaired of any co-operation from the latter. Twenty years after the *Wealth of Nations* was published, the mercantile and manufacturing classes, with few exceptions, were free traders; the landowners, with few exceptions, were protectionists. The explanation of the change in sentiment is to be found in the change of interests. Up to the middle of the 18th century England exported considerable quantities of agricultural produce,—sometimes naturally, at other times under the wholly indefensible stimulus of a bounty on exportation. Now it needs very little intelligence to discover that the profits of an exporter, or at any rate the extension of his trade, depend largely on the variety of imports which he can obtain in exchange for his goods. A country which puts no hindrance on imports always deals to the greatest advantage, and the advantage decreases with restraint. If a country refused to admit any import but one, *i.e.*, money, it would sell its exports in the worst possible market, and for the least possible value, receiving in return an article which the machinery of its trade takes the most effectual possible means to depreciate. Hence the landowners of the 18th century, like the agriculturists of the western and southern States of America now, were free-traders, because free trade was their best hope of profit. The manufacturers, on the other hand, were profoundly afraid of foreign rivalry, even the rivalry of the British colonies, even the rivalry of Ireland. Perhaps the most grotesque illustration of this fear was the law which directed under strict penalties that the dead should be buried in woollen, in order to encourage the woollen manufactures.

The change of sentiment was due to the great mechanical industries of the 18th century. The discoveries of Arkwright, of Watt, of Hargreaves, of Crompton, gave England a practical monopoly of textile fabrics, and subsequently of other products nearly as important. No doubt the Berlin and Milan decrees interfered with the Continental trade of England, though it is well known that Napoleon's soldiers were clothed, in spite of these decrees, in the produce of north-eastern and west country looms. But in other parts of the world England had no rivals, while her supremacy on sea, after the great victory of Trafalgar, guaranteed her traffic. Hence, when the merchant and manufacturer, especially the latter, discovered that protection had ceased to be an advantage to them, and discovered also, for the reasons given above, that the restraint of imports was a disadvantage to production and exportation, the principles of free trade made rapid progress in the manufacturing districts of England. But on the other hand, the very reverse opinion influenced the minds of the landowners. Owing partly to the succession of late harvests, partly to the rapid growth of population consequent upon manufacturing enterprise, partly to the restriction of Continental supply, the result of war, of the great drain which war made on the agricultural population of Europe, and of hindrances put on the import of food,—rents and farmers' profits rose with amazing rapidity, and the Corn Law of 1815 was enacted in order to secure, if possible, the permanence of such rents and profits. The partisans of free trade and protection were only by accident allied to the great historical parties of English public life. The struggle for free trade was really one between town and country, as hereafter efforts in the same direction will get their advocates from the same classes.

It may be believed that, in England at least, the question of protection to manufactures is finally settled, though there are not wanting persons who advocate reciprocity, co-ordinate taxation on foreign products, retaliatory duties on reputed bounties, and the like. But the traditions of legislation are too firmly fixed, and the benefits of free trade experienced during the past thirty years are so generally admitted, that the advocacy of the exploded theory of protection is looked on as a harmless whim which has no chance of popularity. It is not perhaps equally clear that the English people are quite safe against the revival of protection to agriculture under the pretence of sanitary restraint, for that which is the inevitable result of protection to manufacture, the limitation of voluntary consumption, is not so markedly developed from the protection which may be accorded to articles of necessary consumption.

When trade is restrained in those articles of foreign origin which may be produced, though under less advantageous circumstances, at home, and the product is an article in which the use may, to a limited extent only, be economized, the following results ensue:—Prices rise, and profits rise,—of course, at the expense of the consumer; wages, however, do not rise, for in so far as wages are determined by the competition of employers for services, the tendency is towards a reduction of wages, seeing that the use of the product is not increased but rather stinted. Now, the extra profits which protection accords might be secured to those who are already employed in the particular industry thus favored only if the producers have a natural monopoly in the produce of their calling, as was practically the case with the English landowners during the existence of the corn laws, or if the law restrains other persons from competing against them, as was the case in England with Eastern produce during the continuance of the East India Company's chartered trade. If such an advantage be not accorded, capital makes its way to the favored industry; or, to be more accurate, an increasing number of employers compete for the exceptional profit. Such an operation may in some degree raise the rate of wages, though here again, unless the labor be protected by some arrangement, such as apprenticeship, or by the machinery of a strict trade union, the same cause which attracted the energies of the employer will rapidly, even more rapidly, supply what may be needed in the way of labor. Generally, indeed, the check to such a decline in wages is supplied by trades unions, which are, as the industrial experience of the United States has proved, the inevitable outcome of a protective system in a country where combinations of labor are not prohibited by law. In England up to 1824 they were prohibited.

In course of time then, and generally at an early period, the advantage which the protective system accorded to a special industry ceases, by being distributed among a larger number of producers. To this rule there is but one exception, protection accorded to the produce of land. Here, if the commodity produced be one which cannot be dispensed with, and for which no substitute is found, the fact that the supply procurable falls short of the demand may greatly increase the value of the article, and through the farmer's profits raise rents. But the advantage is soon found to be only partial. In civilized and fully settled countries, agriculture is a complex process, in which success depends upon a just balance being struck between tillage proper and stock-keeping. An excessive price of corn, or rather of wheat, due to the machinery of a protective system, apart from the extraordinary fluctuations in price which it induces on the price of wheat, discourages the use of meat, and even of the inferior kinds of grain; for it is a law in prices that any notable exaltation in the value of one of the items which contribute to a joint product invariably depresses the value of the other items; just as it is an equally invariable law in prices that when there is a notable scarcity of any commodity the greatest rise in price always takes place in that form or quality of the article which was cheapest before. Hence there is always a natural remedy, though it is by no means a compensating one to the consumer, for any artificial exaltation in the value of agricultural produce. The principles referred to may be proved by the analysis of facts. Since the repeal of the English corn laws the price of agricultural land has steadily risen; for though the average price of wheat has fallen, that of other kinds of grain, as is found by the tithe averages, has risen, while meat and dairy produce have much more than doubled in value since the period referred to.

It is chiefly, however, in relation to manufactures that the operation of protective regulations is significant or important, for most countries have abandoned all or nearly all restraint on the importation of food. The employer gets no advantage from the regulation, nor the laborer, and the consumer suffers a loss. But the removal of protection would, however great, in most cases be a benefit to the consumer, and inflict considerable loss on employers and laborers, since they would be subjected to a competition in which it is probable they would be worsted; for it may be concluded that the manufacturer cannot, or believes he cannot, subsist without protection, since he would repudiate it if he saw that it was superfluous. Hence it is exceedingly difficult and invidious to alter a system to which capital and labor have accommodated themselves; and it may be stated generally that all the arguments by which an existing protection is defended, however plausible and convenient they may be, are mere sophistry, though very often unconscious sophistry; while the prospect that the sudden suspension of protection to manufactures would seriously disturb the relations of employers and laborers, and would very probably lead to a great destruction of property, points to a real difficulty, which the advocates of free trade will always find confronting them. In practical politics, in so far as they are connected with economical subjects, the difficulty is enormous, for the defence of imperilled interests is always more watchful and energetic than attack on them, and can always count on a co-operation and concentration which is far less fully developed in those who criticise or challenge the privilege. There is a well-known passage in Mr. Mill's political economy in which this author conceives it expedient that protection should be given to certain industries in new countries, provided that the country had good natural resources for the successful prosecution of such an industry, and the protection accorded be only temporary. But apart from the fact that new countries never possess a superfluity of capital and labor, and therefore are least of all well advised in directing these elements of wealth into channels where they would be less advantageously employed than they would be in others; apart from the considerations that all countries have a natural protection in the cost of carriage, and in the comparative ease with which they can interpret demand; and apart from the fact that good natural advantages for any particular industry are sure to suggest that industry at the very earliest time at which it will be expedient to undertake it,—the circumstances which invariably affect a protected industry render it impossible that Mr. Mill's rule of a temporary protection should be applicable. Who is to determine at what time the protection should be removed? Not the consumer, as represented in the legislature, for he would naturally object to the protection from the beginning, since the regulation inflicted a loss on him at the very instant that it came into operation. Not the manufacturer, for until the time comes in which he dreads no rivalry, he believes that the regulation is the guarantee of his ordinary profit, and that its removal will expose him to certain loss. The probability that he may come to such a state as to render the protection manifestly superfluous depends on his making some great, sudden, and lasting stride in the efficiency of the industry which he exercises. But protection discourages all kinds of improvement, and indeed it does not appear that the phenomenon of sudden, vast, and permanent progress has ever been witnessed in economical history except during the latter half of the 18th century in England. Not the laborer who is engaged in producing the favored product, for the wages of labor are adversely affected, in the fall of prices, at an earlier stage than any other object into which gross value is distributed, and are advantageously affected, on the other hand, at a later period than that in which any other interest, other than that of manual labor, is benefited. Loaned or floating capital is most easily extricated from a declining trade, and most easily attracted to a growing trade; fixed capital, and such capital as gives efficiency to fixed capital, is attracted less easily, and by parity of reasoning, is less easily accumulated or appropriated; while the supply of labor is decreased with the greatest loss to the laborer, and increased with the smallest gain.

It may be concluded then that, while Mr. Mill has given a doubtful defence for the adoption of a temporary protection, his limits to the protection so accorded will be found to be practically nugatory, and that in fact the adoption of the system will confer the minimum of good, while the abolition or abandonment of it will inflict the maximum of injury. This result then,—the creation of factitious industries, which cannot be assisted by the operations of Government without loss to the consumer, but which cannot be abandoned by Government without ruin real or apparent to the consumers,—is substantially the apology and defence for the protective systems of Continental Europe. For there is nothing which characterizes modern systems of government more than the tenderness which all parties show towards imperilled interests. There is a growing disposition towards treating them as vested,—that is, as equitably entitled to compensation if their continuity is disturbed or even threatened. Of course there must be a limit to this consideration, for no Government has yet ventured on admitting, however democratic may be its institutions, the vested interests of manual labor, or allowed that it should be compensated, if events required that a change be made in legislation which might interfere with the continuity of its wages. But if the project which is in favor with certain schools of socialism in France and Germany, that the state should assist labor (and of course it could assist only special kinds of labor) with Government subventions, the doctrine of vested interests would assuredly be applied to such assisted callings. It was, perhaps still is, a contention with some public men in England that poor-law relief is of the nature of a vested interest to labor, or that it is the indefeasible heritage of the poor.

It has been very fairly shown by Mr. Fawcett, in his recently published essay on free trade, that many circumstances assisted towards making the acceptance of this great political change in the United Kingdom,—notwithstanding the vehement passions which were excited against those who carried on the struggle for the repeal of all taxes on food. Mr. Fawcett has not by any means exhausted all the facts which aided the advocates of this change, nor has he enumerated all the motives which influenced those who gradually became reconciled to the change, and who even, from being opponents, were converted into partisans of the movement. For the principles of free trade had been accepted by Lord Liverpool in 1820, and had been cautiously tried by Mr. Huskisson in certain directions and with marked success. In fact, the first modifications of the tariff were agreeable to the landowners and the farmers, were acceptable to the manufacturers and small traders, and were objected to, as similar reforms were objected to in Walpole's time, by the great mercantile houses, who were enabled by their capital to retain almost a monopoly of the wholesale trade as against less opulent dealers. But even here a significant law of prices, never indeed formulated, but recognized, effectively enough reconciled the great houses to the remission of taxation on raw materials and on those foreign products against which no home production competed. It is that a remission of taxation, in all consumable articles, and notably in those of extended demand, is followed by a rise in the price of the untaxed articles. This law is a constant refutation of the policy which imposes taxes on imports, and operates still more emphatically when taxes on exports are imposed, as they sometimes are by ignorant and needy Governments. Hardly a voice, therefore, was raised against the bold measures which Peel adopted between 1842 and 1846. They could not possibly harm the landowners; they were a positive boon to the manufacturers and the consumers. So much was this the case that for some time, as has been already stated, the remission of a vast number of small taxes on consumption was made the apology for retaining the income tax.

But the case was very different when the taxes on food produced abroad, and in competition with that produced at home, and on sugar imported from other places than the British colonies, were assailed by the logic of the English free-traders. Here it was seen at once that the most powerful interests were imperilled. For very obvious reasons, the landed interest in England has always wielded far more power, political and financial, than any other. During the Middle Ages it controlled the monarchy, deposed kings, altered the succession, till, up to the beginning of the 17th century, the general appellation which Continental nations gave the English was that of "disloyal." The landed gentry and free-holders fought the wars of the Long Parliament, and subverted the monarchy. The Restoration was a compromise between them and the courtiers, and one of the first results of the Restoration was the enactment of stringent provisions against the importation of foreign food. For centuries the policy, the legislation, the finance of England had been defined by the interests, real or supposed, of the landed gentry, the yeomanry, and the tenant farmers. They were now threatened with a complete reversal of this traditionary policy, and such a reversal seemed to purpose their ruin. Those who lived through this time will easily recall to mind how violent were the passions which the anti-corn law movement excited; how Whigs of the Melbourne school denounced the free-trade movement as folly; how such a man as Lord Brougham, who was conceived, ten years or more before, to have carried the reform agitation to the very verge of sedition, now declared, and perhaps with perfect good faith, that the movement in favor of free trade was unconstitutional; how Sir Robert Peel believed that the opponents of protection were the instigators of a plot against his life; and how, long after the victory was won, it was a commonplace to accuse the leaders of the movement with the most sinister designs against property. And yet the tax on food was in the last degree invidious. It was avowedly imposed in the interest of the landowners, and with a view to maintaining rents. It was allowed that free trade in the abstract was just, protection in the abstract indefensible. There were of course reasons alleged in favor of protection, analogous to those which are now current in the United States and elsewhere, as to the wisdom of a nation being self-supporting; as to the disturbance of the exchanges in the presence of bad harvests; as to the incapacity of domestic industry to compete against the low-priced labor of semi-barbarous countries; as to the destruction of national industries, and the extinction of the best and most patriotic of English craftsmen. But these alarms were either heedless or interested rhetoric, never put forward by really competent critics. Nearly thirty years ago, Mr. Gladstone informed the writer of this article that he never had but one objection to the repeal of the corn law, during the early period of his connection with Peel's Government, and that was the fear that he entertained as to the consequences which would ensue to an interest which seemed, and seemed naturally, to be the very centre of English national life. Statesmen may well be excused from venturing on economical changes of a vast and extended character, even though the propriety of the change may be proved to demonstration; for a period of change, however beneficient it may be in the end, is almost invariably accompanied by temporary and severe loss.

Already, however, there were far-sighted men who predicted that this loss, if loss did ensue from the change, would be a minimum. They discovered or anticipated this in pursuance of that other fundamental law of prices already hinted at. When the products of any industry are numerous, and all are in demand, such an alteration in the cost of producing one of these products as makes it, from being the most profitable branch of the calling, the least, is followed by an exaltation in the value of the other products. Thus it is constantly the case that the bye-products of a complex industry are found to be the sole source of business profits. Such at least is said to be the fact in the manufacture of gas and soda ash, and it is alleged that even if a substitute be found for gas as a means of lighting, the value of the bye-products in the manufacture is so great, and the use of them so indispensable in the economy of society, that the manufacture would still be necessary and profitable. But there is no illustration of the law which is so exact and invariable as that supplied by agriculture. During the existence of the corn laws, the profits of the farmer and the rents of the landowner were estimated in wheat. It was from the probable decline in the value of wheat that all the sinister predictions as to the future of the landed interest were derived. So entirely did grain, especially wheat, form the measure of agricultural values that ten years before the repeal of the corn laws the commutation of tithes took no account of any other kind of agricultural produce than the three principal cereals, although in that commutation interests, lay and clerical, of not less, in capital value, than 150 millions sterling were involved. Even here, however, the tithe-owner has suffered no loss by the change, for though the price of wheat has fallen, the decline has been more than compensated by the upward movement in the price of barley and oats. Since the repeal of the corn laws, the tithe rent charge has been 2½ per cent. above par value. Far greater, however, has been the consequence of the change on the price of other agricultural products, especially meat and dairy produce, the value of which has nearly, if not quite, doubled during the last forty years. Now this result was anticipated in a rough manner by the shrewder heads among landowners and occupiers, and therefore reconciled many whose interests might seem to be imperilled to a change, which, while it threatened a superficial and temporary loss, might easily determine in a permanent and increasing profit. And finally, the farmers learnt by demonstration and experience that, whoever might gain by restrictions on the trade in food, they did not; and that in some unexplained manner the machinery of a law which seemed to be intended for their profit either turned out to be a loss, or was wholly inadequate to secure the results intended. And yet, though the people were starved, manufacture was unprofitable, foreign trade was declining, and the revenue had been constantly insufficient for the expenses of government, it needed the catastrophe of the Irish famine in order to give effect to an agitation more prolonged, more costly, and more popular than any which has happened in the history of a civilized nation, to effect a peaceful repeal of laws, which did no person whatever any good, which were no advantage whatever to the parties for whose special benefit they were enacted, and which inflicted prodigious losses on the two most important classes in the community, the producer and the consumer.

The history of the movement which led to the repeal of the English corn laws in 1846 has been sketched at some length, in order to show that if, in a case where the impolicy and the injury of the law was proved to demonstration, it was so arduous a task to effect a change, the difficulty is far greater in those countries where it is not possible to array such formidable forces against the continuance of a protective system. It is easy to show that the law of prices above referred to applies with the same cogency to the collective industries of any country whatever as it does to such industries as necessarily supply varied products, and that any artificial attempts to direct the home and foreign trade of a country into special channels are sure to bring about a factitious exaltation of one set of values, and a factitious depreciation of another set of values. Various Governments in Europe, in the New World, and in the British colonies have striven to start special industries. They will succeed in the attempt, however injudicious the attempt may be, if there be a demand for the product which they determine to artificially foster. But from two consequences they cannot escape. The consumer of the produce thus stimulated into an unnatural or premature existence must pay for the policy of the Government in enhanced prices, and the producer of goods must offer more of his goods for sale in order to effect an exchange in that which the Government permits to be imported, but hinders either in kind or quality with a protective tax. But it by no means follows that, when the consequence of this policy is exhibited, when its mischief is demonstrated, when its futility is exposed, nay, even when it is proved that, on pretence of doing a special service to the Government and the people which it is intended to aid, it deliberately gives the maximum of advantage to the foreign exporter, and inflicts the maximum of loss on the domestic consumer, the country which makes the discovery will reverse its policy. For, apart from the considerations which have been dwelt on above, the fact, namely, that the revocation of a protective duty which is efficient in raising prices must be followed by a loss to the producer, the existing practice may always be defended by a number of plausible arguments, held, it should admitted, with perfect good faith by those who promulgate them, however shallow and erroneous they may seem to others, whose passions and interests are not stimulated to defend such a practice. With the same sincerity of conviction the defence may be further supplemented by appeals to an irrelevant patriotism, or by an imputation of sinister motives on the part of assailants, or by a bold assertion that the social condition of other countries differs radically from that of the district in which protection is maintained. And finally, in all political and economical movements, it must be repeated, the forces of defence are far more manageable than those of attack. For, as the defenders are in possession, and the sentiment of civilized societies is always favorable to existing interests, the defence can urge, if not with truth, at least with great effect, that it is dangerous to relinquish what is actual, and under which society has long existed, for that which is hypothetical, problematical, experimental; and it can always threaten its assailants with the indefinite danger of the discontent which may come from a great and far-reaching change. Those who remember the history of the free-trade movement in England are well aware that all these expedients were used against the promoters of the movement, though the position which the defence occupied was singularly untenable. But it is certain that in countries which have adopted protection the defence will be more stubborn, and the struggle more protracted than it was in England more than thirty years ago. And in illustration of this fact, it may be observed that it took all the forces at the disposal of the personal Government of the second French empire, and all the threats of a power which was then at the highest of its reputation for military prowess and domestic control, to impose upon the French manufacturers, even in view of great reciprocal advantages to the most important and natural among the domestic industries of France, the very moderate concessions of the commercial treaty with England. The Government of Napoleon actually went to the length of informing the iron manufacturers of France that they would be held personally responsible for the effects of any discontent that might arise by any act of theirs towards their workmen which might be taken in view of the contemplated changes; and the menace was effectual, because it was not doubted that it would be followed by action, and that this action would be irresistible.

As the origin of protective enactments was a desire that a nation should profit by the losses of another nation, and as the extension of this feeling is the primary motive of war, so a permanent or persistent division of international interests, with the object of sustaining or promoting municipal or rather particular interests, is a fruitful source of international difficulties. It is, in fact, what Thucydides calls, speaking of the caution with which commercial intercourse was carried on in the days which preceded the great Peloponnesian war, an unproclaimed war. Many forms of patriotism, falsely so called, have inflicted grievous and ineffaceable injuries on mankind. The war for empire between the old and new notions of government, which was at the root of the Peloponnesian war, was the ruin of Greek civilization. But each of the combatants appealed to the patriotism of race, and the defence of repugnant institutions. The Thirty Years' War threw back Europe for two centuries, and left behind it memories, jealousies, policies, the effects of which are even now dominant in the attitude of the great European powers, and in the forms of European government. Still the Thirty Years' War was a struggle between anarchy and despotism, interminable disunion and forcible unity, and could appeal to some noble passions in the midst of a mass of ignoble aims, to some generous purposes in the confusion of a host of sordid and mean impulses. But wars for the monopoly of trade and production have done nothing but mischief, have not been varied by any worthy purpose, have been, as Adam Smith described them with honest energy and undeniable truth, mean and malignant. Not much better is the temper which carries on a furtive war against the general industry and the general good of mankind under the spurious name of a patriotic protection. But it must be admitted that no tendency of civilized societies is so inveterate, because none is defended with more ingenious and more unconscious sophistry, and none appears to be more necessary for the maintenance of existing interests.

Nations accommodate themselves, but with losses which may be easily described, though they cannot perhaps be numerically calculated, to protective restraints on trade. But it is a penalty on having been in the right that any departure from the right into the wrong is more mischievous than it is to remain in the wrong. The people of England are, as far as manufactures and trade are concerned, fairly committed to free trade. The world admits that England has prospered under free trade; indeed, it is difficult to deny the fact, and equally difficult to assert that the prosperity which the country has reached has been achieved in spite of free trade. It might be shown that the very circumstances which, thirty years ago or more, were adduced as conditions under which free trade would be ruinous to England have now been alleged in order to explain why it has been exceptionally beneficial. The growth of population has given a practical refutation to the alarms of Malthus, though it has not rebutted and could not rebut the abstract principles on which that theory was founded. The repeal of the corn laws has modified the Ricardian theory of rent, and has reduced it to the explanation of the cause which measures the difference between the rent paid for the same superficial extent in two pieces of ground. The same fact has been a cure for the currency crazes which the old sliding scale used to foster, for the notion that we might be impoverished by a drain of gold, and for the dread that the country would be ruined if the balance value in the imports exceeded that of the exports. A thousand economical fallacies still dominant in the minds of those who are in the darkness of protection have been dissipated in the light of free trade. The English people were, as far as the fundamental principles of social economy were concerned, in the cave of Plato, mistaking shadows for realities, and constrained to get their impression of the shadow from the false mirror of an artificial system. But free trade has put English industry into the daylight, and with the daylight the country has gradually become familiar. More or less violent reconstructions of society, the socialism with which much of civilized Europe is pestered, the paternal theory of government in its most grotesque form under which the American republic attempts to control and distribute the occupation of its free citizens, are to Englishmen as extinct as the animal worship of Egypt, the nature worship of Greece, and the other strange beliefs, which have been popular in the infancy of the world and of its knowledge. That English trade and manufactures are open to dangers which may check or diminish their prosperity must be admitted, but those dangers are of a totally different kind from those which menace the progress of such countries as imagine that protection is a safeguard.

The great advantage which free trade has bestowed on English manufacture consists in the fact that it has enabled the producer to interpret accurately the cost of production, and therefore to discover the prospect which his industry has of a remunerative market. It is superfluous to protect an industry which is strong enough to assert itself in the rivalry of competition. It is similarly superfluous to protect an industry the products of which, by reason of their bulk and cheapness, are shielded from competition by the costs of carrying the same products from foreign parts, or even from remote districts within the same political system. It may be inferred, therefore, that protection is not demanded except in cases where the industry would be exposed to the dangerous or successful rivalry of the foreign manufacturer, and therefore is carried on under circumstances which, by increasing the cost of production, render the employment of labor and capital on the industry in question a less advantageous outlay than they could be in other objects. If it comes to pass that under favorable circumstances the protected industry can cope with unprotected rivals in a common market, it is clear that the necessity for protection has passed away, and that the existence of the restraint is needless and vexatious. Thus, for example, if it be true that American cotton cloth can successfully compete against Manchester goods in China, or Japan, or Central Africa, it can, *a fortiori*, compete successfully against Manchester goods in the United States themselves. But it also follows that, if this position be not attained, the existence of the restraint is a constant impediment to its being attained, because the industry, as estimated by the cost at which its product is attained, invariably accommodates itself to the circumstances which naturally or artificially control its production, especially in reference to the amount of capital and labor devoted to it, and the rate of profit which the manufacturer enjoys. There is no reason to believe that in the protected manufactures of Germany, France, and the United States the profit of the manufacturers is greater than is derived from unprotected industries,—that, for example, the French ironmaster or cotton-spinner gains a greater advantage from his calling than the wine-grower does. On the contrary, the loudest complaints of declining trade, and the baneful influence of foreign rivalry, are heard from the industries which have successfully demanded the assistance of protective duties. It is always the case, and it always will be the case, that the opulence and prosperity of a country will depend on the success with which its natural industries are prosecuted, and on the prudence which it shows in hitting the proper time in which other industries may be attempted with a reasonable prospect of remunerative profit. For just as weakly plants and animals are the first to succumb to those climatal or atmospheric conditions which are unfavorable to health and vigor, as in the struggle for existence feeble stocks disappear and more energetic forms occupy their place, so industries which need artificial support are the first to feel commercial adversity, and the last to recover from it. It is stated, and the statement is not seriously controverted, however much the true interpretation of the facts is disguised or resisted, that during the period of commercial depression which began after 1874, the countries in which the greatest efforts have been made to sustain artificial industries have suffered more than England, which has conceded no such assistance whatever.

But it is not only in the fact that the producer is able in an atmosphere of free action to interpret the prospects of his own market best, and to solve most readily the problem as to what is the relation between cost of production and possible profit, that the value of free-trade principles is discerned. The same principles which in England have been happily recognized as fundamental have indirectly done more to soften the differences between employer and laborer than anything else. No civilized country has had more reason to fear the consequences of hostility between capital and labor than England has. For nearly five centuries the legislature of this country strove to regulate the rate of wages in the interest of employers. To the numberless and severe statutes of laborers, which began with 1350 and were continued in full force up to 1825, when they were relaxed rather than repealed, we owe the English poor law in the first place and the trade union in the second. It was natural, when the English Government had been attempting for so long a time to keep down wages by law, and looked with so much hostility on any organization among the working classes which seemed likely to better their lot, that when the severity of these laws was relaxed the laborers should eagerly adopt the machinery from the use of which they had been so long debarred. But deplorable as has been the combat between labor and capital, and blameworthy as many acts have been on both sides, no one who has given any attention to the subject can fail of noticing that the aims of the trade unions are simple and intelligible, that the representatives of these combinations court debate, criticism, and sympathy from the public to which they appeal, and that the struggle is carried on with increasing mildness and forbearance. The English unions do not aim at reconstructing society, nor demand subventions from the state as a means by which they may resist the power of the capitalist, nor adopt those projects which give from time to time such trouble to Continental Governments. The fact is, the English parliament has withdrawn all artificial aids from the capitalist, and the workman is content to stand on the same level with his employer as far as the state is concerned. But where, as in other parts of the civilized world, the state, for some reason or the other, has determined on fostering the existence of an industry which cannot exist without state help, or does not think it can, the workman is sure to attempt, with what success he can, either to appropriate a part of the extraordinary profit which the Government in the early stages of its action accords to the capitalist, or to demand that an analogous benefit should be conferred on him by the operation of law. The protective system of Continental Europe is the source and the strength of European socialism, and is responsible for its fallacies and its excesses. Those Englishmen who lived through and watched the simultaneous energies of the Chartist movement and the free-trade agitation had abundant opportunities for inferring what turned out to be the fact, that the success of the latter movement would be a death-blow to the former project. When at the outbreak of the civil war in the United States a rigidly protective tariff was imposed on the Union in lieu of a more moderate system, those who had busied themselves with the phenomena of production and the social relations of economical forces were able to predict that, apart from the more obvious evils which ensue from a false step in the political economy of a nation, the attitude of labor towards capital would be aggressive, distrustful and menacing, and that the mischief, when once generated, would be growing and permanent. Government in England interferes very little with the action of individuals, but this is possible because Government in England abstains as much as possible from meddling with those relations which can be made to adjust themselves. In England the adage of Mr. J. S. Mill, that "the best remedy for the evils of liberty is more liberty," may be a wise generalization, but when the liberty of labor is curtailed, it is not quite so clear that a Government can with safety to itself dispense with that control from which English social life is happily free.

The adoption of protectionist principles in civilized and industrial communities is undoubtedly an injury to such other communities as have adopted free-trade principles, because it curtails their market and induces an uncertainty as to whether the produce of their labor will find a sale. This mischief is exaggerated when the prohibitory or protecting tax is a variable amount. Thus during the existence of the English corn laws the foreign agriculturist was unable to foresee whether the demand for his produce in England, under the pressure of scarcity, would be admissible for him at remunerative rates, and he was consequently deterred from anticipating this demand. If indeed the demand did arise, his gains might be enormous, provided he had it in his power to satisfy the demand. For example, at one time the sliding scale was fixed so high that foreign corn was admitted duty free only when the market prices in England marked 84s. a quarter. If such a price were reached and the importer was in possession of a considerable stock, which he had been able to store in bond at 35s., he could instantly take advantage of the situation and greatly to his own advantage. It is true that such an occasional contingency did not compensate for the general insecurity of his industry, and the risk which he ran in waiting on a market into which he might never be able to enter. Hence the repeal of the English corn laws has given a very powerful stimulant to agricultural industry over the whole world.

Fixed duties do not operate so disastrously on foreign trade, even when the fixed duty is levied on such products as vary in quantity, and therefore in price, with the seasons. For in the vast majority of products values conform generally to the cost of production, and even in those which, like food, are determined also by the relations of demand and supply the wider the area is from which they are derived, the less are they liable to variation in supply, the element of demand being nearly a uniform quantity. Still it must be remembered that all duties on imports check consumption, and, by implication, discourage production. The proof of this is seen in the fact that the reduction of any duty on an article in general demand is always followed by a rise in price, which continues till supply corresponds to the new demand. If therefore duties levied for the purposes of revenue have this effect, then, *a fortiori*, duties designedly imposed for the sake of protection will have a similar effect. If the protective enactment has any force at all, it must diminish the market of the country against which it is levelled. It may not be wholly effective, but it must have some effect. Thus, when under the Berlin and Milan decrees the first Napoleon strove to expel all British manufactures, and all the produce of the British colonies, from such parts of Europe as he could control, it is unquestionable that these decrees were a hindrance to British commerce, though to a considerable extent English manufacturers were able to elude them.

Still the country which adopts free trade has a great advantage in trade over such countries as adopt protection even in its commercial intercourse with them. There is no country which wishes to curtail the export of its raw materials, in the production of which it has natural advantages, and of course it is equally willing to export its protected manufactures. Now it is plain that it would prefer to deal with a country which, unlike itself, imposes the least possible restraint on importation, and that the most advantageous market would be that in which no restraint at all was put. In order to use this market then, it will be content to offer its goods on the most favorable terms, and under the conditions of the strictest competition. It knows that a country which adopts free trade is best able to interpret its own demands, and its own power to satisfy the demand of other countries. Hence a free-trade country is a national entrepôt, in which foreign goods are procurable at the lowest rates. In addition, as has been stated before, the country which puts no artificial restraint on its power of general purchase has always a great advantage in all commercial transactions over a country which does put such a restraint on itself.

Free trade then, as understood in England, means such a liberty of production and exchange as is unfettered by any of the restraints which have been imposed, in order that special industries may be artificially stimulated, by the machinery of a fiscal system. But there are other uses of the term which may be touched on, and in particular the application of it to labor and land. It was stated at the commencement of this article that Governments, in pursuance of their standing duty, that of protecting the weak against the strong, may and should put limits on free action as regards labor. and it is alleged that the expression free trade in land is a misnomer. We shall attempt, in concluding this article, to give a brief explanation of the historical and other circumstances which have brought about the present state of things in England, and to define the economical conditions under which the relations of labor to production, and land to agriculture, are capable of an economical estimate.

As the policy of ancient states did not attempt to control trade in the interest of their own citizens, so it did not hinder the individual in the prosecution of any industry. There is no evidence that the professions were practised by persons specially licensed for that purpose, and it is certain that the craftsmen of antiquity were not compelled to pass through a period of apprenticeship before they could follow their calling. In modern times, however, the practice of licensing the members of certain professions, and of exacting a period of servitude in all crafts and trades, under the name of apprenticeship, has been nearly universal. Up to comparatively recent times the same legal instrument was employed as a preliminary to the study of law and physic as was demanded from the trader and the artisan. The origin of the custom, which was assailed on principle by Adam Smith, is to be found in the history of the charters which were obtained by towns. These charters were purchased from sovereigns or such lay and spiritual proprietors as possessed towns in fee. The privileges which such instruments conferred were considerable and valuable, were eagerly sought after and guarded with jealousy. Among the most important of these in England was the right of assuring, after a short uninterrupted residence within a walled town, the franchise of a free man to the resident serf. It was therefore expedient, and in order to avoid arousing any suspicion that the franchises of the town were abused, that some significant limit should be put on the acquisition of these privileges by individuals. Hence, at a very early period, guilds were established in chartered towns; enrolment in some guild became a necessary prelude to sharing the franchises of the town; and apprenticeship was made the condition under which persons could ordinarily enter the guild and practise the craft or trade. There is reason to believe that the customs of these trading companies put it into the power of those who administered the affairs of these companies to exercise a large and arbitrary control over all the members of the guild. The practice of apprenticeship began, in all likelihood, at an early date, but the earliest instruments which the writer has seen are of the 15th century. It is only, of course, by accident that any have been preserved, since they had only a temporary and personal interest. In course of time the legislature exacted the condition of apprenticeship from all artisans and traders, notably by the 6th of Elizabeth, for during a long period it was the policy of the English parliament to put every possible hindrance on the migration of the agricultural laborer to the towns, and the most successful expedient by which this migration could be checked was that of imposing the servitude of apprenticeship on every one besides the agricultural laborer. A custom then, which commenced with the interest which the trading company had in its chartered monopoly, and which closely resembled the machinery of the regulated companies for foreign trade, was strengthened and finally enforced by the parliament itself. In course of time the legislature abandoned its ancient policy, except in so far as it exacted from certain professions the equivalent of apprenticeship, on the ground that by so doing it protected the public against incompetence and fraud. The retention of apprenticeship in certain kinds of manual labor is due to the action of trade unions, voluntary associations which occupy a somewhat similar position to the guild companies of the Middle Ages, and which exercise an influence over a far larger number of persons than are formally contained in the association. The object of apprenticeship in handicrafts is to maintain a high rate of wages by stinting the number of persons who are engaged in the occupation. Hence, and for the same reason, artisans object to the importation of foreign labor, especially in such callings as are protected by apprenticeship. On no other ground, at least, would it be consistent to acquiesce in the importation of the products of labor and, by free trade in food, of what may be called the raw material of labor, and to object to the free circulation of labor itself.

It is a question of merely speculative interest to ask whether a Government does wisely in restraining the practice of certain callings to those who have been certified to have passed through a preparatory training for the calling. It is only a little over sixty years since it put the restraint on medical practice, and the limits which have similarly been imposed on the legal profession originated in the recognition of certain persons only in certain courts of law. But there is no theoretical defence for the privilege accorded to such certified persons, except it be that by these means the public is protected from the danger of employing incompetent practitioners. The police which the legislature exercises over unlicensed persons must not be supposed to be in the interests of those who are permitted to practise, but in that of those who employ professional services. There is, however, a tendency towards increasing the area over which this police is exercised, and latterly some public teachers, for example, who are employed in primary schools are made liable to the obligation of satisfying some public authority as to their competence for the work which they undertake. On the other hand, there are writers who argue that all such restraints are mischievous, not only because they control the choice of occupation, and are, therefore, invasions of natural and innocent liberty, but because they do not and cannot supply any proof of practical ability on the part of those who are certified, and because they weaken the habit of caution and prudence which all persons should possess as far as possible in selecting those in whom they may place their confidence. Why, it may be asked, they say, should a lawyer be certified to carry on his calling on the ground that the trust reposed in him makes it expedient that the law should exercise a control over this calling, and a similar restraint be not extended over bankers, whose relations to their customers are even more delicate and confidential than those of lawyers?

Again, there are callings in which no restraint is put on the choice of the calling, but an energetic control is exercised over the practice of the calling, a control which sometimes extends so far as to prohibit some practices which are historically connected with the calling. Thus, since 1844, no new English bank is allowed to issue and circulate notes payable to bearer, such a note being virtually a cheque payable at sight, and drawn by the banker on his own assets. The motive for putting this disability on bankers was to prevent the undue extension of a paper currency. But even though it may be doubted whether such a result was effected, or even that there was danger of such a result, the restraint on free action can be defended on the ground that the acceptance of such a note puts a risk on the holder to which he should not be subject, and that the refusal to accept such notes suggests a suspicion that the issuing parties are of doubtful solvency. Again, there are certain callings over which a police is exercised in the interests of the revenue, as on those persons who are engaged in the manufacture of excisable articles. There can be no doubt that such a supervision is a hindrance to trade, and some persons who advocate direct taxation have alleged, as one of the strongest arguments in favor of their theory, that the abandonment of all excise and customs regulations would make England a free port for the whole world, would greatly extend its commerce and its manufacturing energy, and widen its markets. And lastly, there are certain callings which are permitted, but watched and controlled in the interests of morality. Of these the most notable is the occupancy of houses where intoxicating liquors are sold, and of other places of public entertainment. Few persons doubt that an efficient and incessant supervision should be exercised over these places, though they differ widely as to the extent and character of the control, and the agencies by which the control should be put into operation. The regulation of public houses is the oldest form of domestic police over occupations in England, for it can be traced back to the manorial inspection which was general after the Conquest, even if it did not exist in the Anglo-Saxon village. English law, therefore, exercises a control or restraint of trade over industries which are laudable, or innocent, or legal, because it is found, or is thought to be found, that they may be abused to serious public inconvenience or mischief. Some amusing illustrations of the extent to which the privilege of unlimited issue of bankers' paper may be abused are afforded in the history of what was called "wild-cat banking" in the Western States of the American Union. It is remarkable that the United States, which have adopted, and to a great extent with evident sincerity, extreme views in favor of the policy of protection against foreign rivals, have also permitted from time to time, and with scarcely any check, extreme license in the conduct of business within the limits of the Union itself.

With the exception of these and analogous instances,—when the safety and morals of the public justify, to a larger or smaller extent, the supervision of the state over the free choice of industry,—the concession of that free trade in labor which puts the minimum of hindrance on the field of employment and the character of employment which the producer selects is quite as important to the wellbeing of a state as the concession of a free agency to its capital and a free market for its products. For as all wealth is the produce of labor, and as the efficiency of labor is the first and last condition of national progress, as the efficiency of labor is primarily brought about by the division of employments, and as the division of employments knows no limit as long as the market of products is extended, so it is of the highest interest to the efficiency of labor that the field of its operations should be as open and free as possible. But here it is to the purpose to observe that the natural distribution of labor very often masks the effect of a mischievous economical system. There is no country in which this fact has been so systematically ignored as in the American Union. In the United States, economists who have steadily maintained, with the best arguments at their disposal, that the growth and progress of their country have been assisted by the adoption of a protective system, have omitted, in all their estimates of what constitutes the material progress of the Union, the fact that, in whatever other directions they have regulated industry and commerce on a protectionist basis, they have always, and to an extent that no other country has done, accepted and insisted on free trade in labor. They have not only welcomed all comers,—some little irritation at Irish labor, and a more serious objection to Chinese immigration excepted,—but they have imposed no tariff on the importation of labor, nor even contemplated such an extension of protection to American industry. It would not, however, be difficult to show that, on the grounds ordinarily taken by American statesmen and publicists, they would be consistent in denouncing the immigration of aliens. They have, however, with a happy inconsistency, not only not taken this step, but they have wisely and advantageously insisted that the Old World notion of indefeasible allegiance shall be relaxed, at least on behalf of those who have made the United States their home. Here they have been free traders without stint. And it has been fortunate for America that they have not extended such prohibitions to alien humanity as they have to the products of that labor which alien humanity has offered them for sale. For several years the United States received about 200,000 emigrants annually from the Old World. It is a moderate estimate that each of these persons represented an outlay of at least £150 in his bringing up, or in other words that, had he been born in the United States, he would have cost at least as much as this sum to bring him into that state of efficiency which he carries to his new home. The Old World has therefore been bestowing a voluntary tribute of £30,000,000 annually on the United States, a contribution which is quite sufficient to balance the mischievous effects of economical fallacies, though it is possible that these fallacies may be so disastrous as to neutralize the value of this branch of American imports, or even to check the importation altogether. Not, indeed, that the effects of unwise economical action are easily or rapidly discovered. The present advantage of restraint for the benefit of the producer is obvious; the consumer is left out of sight, and is commonly unconscious of the process which is narrowing his powers. At last, when the consequences do come, sophistry and self-interest are both active in assigning the facts to other causes than those which are really dominant, and in resenting and resisting all change.

When it is said that the principles of free trade should be applied to land, it is meant that a natural object, the products of which are of supreme necessity to mankind, is not rendered accessible to purchasers, or not rendered so profitable to occupiers as the interest of the public requires. Land in populous countries is, relative to the community, very limited in amount, and as it is the *locus standi* of all industries, its distribution, as is alleged, should not be so restrained as to induce a restraint on the efficiency of industry. No economist worthy of the name has ever disputed the sacredness of private property. To do so would be to undermine the very foundations of his science. No economist, even though he may be betrayed into heresies as to the nature and extent of free exchange, has ever doubted that within certain geographical limits the fullest freedom of innocent production and trade should be accorded. No American protectionist has yet argued that it is expedient, in order to develop at the earliest period the possible manufactures of the Western States, that these States should be allowed to restrain by prohibitive duties the cotton and hardware of New England. All discussions therefore about free trade in any commodity, and among others in land, must presuppose that property should be respected, and exchange should be free. If the so-called economist denies the name of property to that which must be secured to its owner, in order that industry may be exercised in the best possible way, he has abandoned the principles of his science. And if, on the other hand, it be insinuated that, while he is seeking to point out the manner in which industry may be most productive, he is assailing the ownership of that kind of property on which all industry is exercised, the criticism is invidious and unfair. It needs no proof that the success of industry and the material progress of society cannot be expected, except under the guarantee of private property in land, as well as in its products. And furthermore, there is no reason for objecting on economical grounds to the process by which the distribution of land in England is restrained, unless it can be shown that the existing system is a check to industry, or a hindrance to supply, or an impediment to the effective development of agricultural skill.

It cannot be denied that, if the claim to free trade in land is intended to imply that, under existing circumstances, a very small portion of that which would be distributed by sale is brought into the market, the fact corresponds with the statement. The custom of primogeniture directly tends towards the restraint of distribution, and the power of settlement acts more energetically in the same direction. Nor can any one doubt that there are circumstances under which the custom and the power operate disadvantageously. When the owner of land is virtually bankrupt, it would clearly be far better if the estate which he cannot improve were in the hands of those who can improve it, for the misuse of a necessary industrial instrument has worse effects on the economy of society than the ill use of the products of industry. The one is the same as inducing artificial barrenness on a portion of that which is limited in amount and is of supreme utility, and the other is the waste of that which is practically unlimited, and which can be supplemented from other sources. Again, the ill use of land is a total loss; but the prodigality of one who squanders the produce of labor is only a partial waste, for much of the wealth which seems to be expended on the pleasures and follies of individuals is really transferred to those who are capable of making a better use of it than its original possessor does. Hence, when land is in the hands of bankrupt proprietors to such an extent as seriously to hinder its adequate occupancy, it has not been thought a violation of the rights of property to dispossess the bankrupt owner by a compulsory sale, and to put a new and more competent proprietor in his place. Such a step was taken, and with very satisfactory results, in Ireland, and there is reason to believe that similar powers might on many occasions be exercised with advantage in England. In a minor degree charges on land are a hindrance to its adequate improvement, for the means of the proprietor of a burdened estate are diminished, while if the land were in other hands its resources would be developed. Analogous to these inconveniences are the costs of conveyance, and the demand of superfluous guarantees of title.

But the phrase "free trade in land" has been obscured by its connection with another aspect of the relations between the owner of land and its adequate cultivation, the interpretation, namely, which divers disputants give to the freedom which accompanies contracts for the occupancy of land. In England, as is well known, the owner and the occupant of land are, unlike the case in most other countries, almost universally different persons. Such a difference began very early in English society, that is, towards the latter end of the 14th century, and has no doubt become more marked by the peculiar customs which affect the ownership of land in England. Now it is alleged that under existing circumstances no true freedom of contract exists on the part of the occupant,—that the power which custom has given to the owner, and which law has strengthened, is so great that the occupier is virtually helpless; that the legitimate progress of agriculture is checked; and that a supply which skill could make almost indefinite, and which might be made to satisfy the wants of the population, is wholly inadequate for the purpose, the deficiency being wastefully supplemented from foreign importations. For it is asserted that one of the contracting parties has it in his power, by the extent of his resources, to reduce the other party to the most disadvantageous terms of a precarious occupancy, and that, though the occupant may be blamed for submitting to such terms, or at least be held responsible for the bargain which he has voluntarily made, the public is interested to a very serious extent in a better and freer relation between owner and occupier. And it is further urged that freedom of contract is not to be limited to the moment in which the bargain is struck, but must in continuous relations be so continuously present that neither of the contracting parties should be able to inflict a permanent loss on the other,—or, in other words, that contracts cannot be called free unless they are constantly liable to an equitable revision. The controversy has been carried on in England and Scotland in the form of an attack in the latter kingdom on the local law of hypothec, in the former, and to a less extent in the latter, under the claim of compensation for unexhausted improvements. As yet no legislation of a practical character has been the result of a controversy in which some intelligent tenant farmers on the one hand, and principally on the other the duke of Argyll, have been the disputants.

It is probable that on the whole successful agriculture, that is, the production of the largest quantity in value from the soil at the least cost, has made more progress in the

United Kingdom than in any other country. This has been especially the case with stock breeding, the pre-eminence of the United Kingdom being marked and admitted in this department of agriculture. But this fact itself, as the occupier is less within the power of the owner as a stock-breeder than he is as a mere cultivator, seems to suggest that the relations of the two parties need a better understanding than they have yet received, or that their contracts will at some time or the other require the interpretation of law. The difficulties, however, of any question as to the limits and control of freedom in the contracts entered into between the subjects or citizens of the same Government are great and nice. There is but little difficulty in showing that the best interests of the whole human race are consulted when the fullest freedom is given to the exchange of products, however much the process is hindered by passion or self-interest, and however great may be the practical hindrances in the way of a principle which few men have the hardihood to deny in the abstract. But there are serious difficulties in interpreting the relations in which capitalist and laborer, owner and occupier, stand to each other, and in deciding how the just rights of property may be harmonized with the just claims of industry, and the paramount consideration of the public good. (J. E. T. R.)

FREEWILL BAPTISTS, a denomination of Baptists in the United States and Canada, holding similar doctrines to those of the General Baptists of England. Founded in 1780 by Benjamin Randall, a Baptist preacher, who had been censured for teaching anti-Calvinistic doctrines, it soon made considerable progress, and in 1827 a general conference, meeting every three years, was instituted. Besides erecting numerous schools of different grades, the Freewill Baptists have established three colleges, one at Lewiston, Me., one at Ridgeville, Md., and a third at Hillsdale, Mich., to which both sexes, and colored people as well as whites, are admitted. A fourth college is being erected at Rio Grande, Ohio. In 1877 the denomination had 1464 churches in the United States, with 1295 preachers, and 74,651 communicants. In Nova Scotia and New Brunswick there is a separate conference, the membership connected with which is upwards of 9000.

FREIBERG, or FREYBERG, a town of Saxony, is situated on the Münzbach, not far from its confluence with the Mulde, and 19 miles S. W. of Dresden. It is well built, and is still surrounded by its old walls. It is the seat of the general administration of the mines throughout the kingdom, and its celebrated academy of mines, founded in 1765, is frequented by students from all parts of Europe. Connected with the academy are extensive collections of minerals and models, a library of 18,000 volumes, and in a separate building laboratories for chemistry, metallurgy, and assaying. Among its distinguished scholars it reckons Werner (who was also a professor there), Humboldt, Mohs, and Jameson. Freiberg has extensive manufactures of gold and silver lace, woollen cloths, linen and cotton goods, iron, copper, and brass wares, shot, gunpowder, and white-lead. It has also several large breweries. In the vicinity are numerous mines of silver, lead, copper, and cobalt, affording employment to about 6000 miners. The old castle of Freudenstein or Freistein, situated in one of its suburbs, is now used as a corn magazine. In the grounds of the castle a monument was erected to Werner in 1851, and one to those who fell in the Franco-German war was erected in 1874. The cathedral, an elegant Gothic edifice, founded in the 12th century, and rebuilt in the 15th century, after its almost complete destruction by fire, has a richly adorned portal in the Byzantine style, called the Golden Gate. It contains numerous monuments, among which is one in memory of Prince Maurice of Saxony, who fell in the battle of Sievershausen in 1553. In the lady chapel adjoining are the remains of Henry the Pious and his successors down to John George IV. who died in 1694. Among the other public buildings are the old town hall, dating from the 15th century, the gymnasium, the real school, the female burgher school, the new law courts, the cavalry barracks, the antiquarian museum, and the natural history museum. Freiberg owes its rise to the discovery of its silver mines in the 12th century. The castle of Freudenstein was erected for its defence about 1175, and the town was surrounded by walls in 1187. It was a long time one of the summer residences of the Saxon princes. The population in 1875 was 23,559.

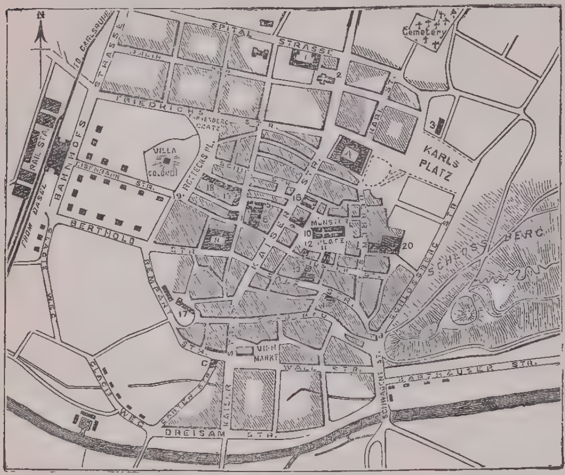
FREIBURG, or FRIBOURG (the French form of the name), a canton of Switzerland, is situated in the district to the S. E. of the Lake of Neuchâtel and the N. E. of the Lake of Geneva. At no point do its boundaries actually touch on the Lake of Geneva, but in two places they come within two or three miles of its shores. Owing to the refusal of the cantonal authorities in 1802 to incorporate the Reformed districts of Payerne and Avenches, it has a very irregular outline towards the Lake of Neuchâtel, and indeed breaks up into *enclaves* which are completely surrounded by the territory of Vaud or Waadt. The only other canton with which it is conterminous is Bern, which lies to the north and east. With very slight exceptions in the south the whole canton belongs to the basin not of the Rhone but of the Rhine, being traversed throughout its entire length from south to north by the Sarine or Saane, which rises in the Sanetsch in Bern and ultimately joins the Aar below Güminen. The surface of the country has considerable variety of relief, but can hardly, in such a region as Switzerland, be described as mountainous. The canton, however, is the very heart of pastoral Switzerland, and the home of the "ranz des vaches." The southern portion is occupied with offshoots of the Bernese Alps, presenting such heights as the Moléson, 6578 feet; the Dent de Vüdetze or De Lys, 6609 feet; the Vanil des Arzes, 6513; the Cape au Moine, 6376; the Dent de Broc, 5986; Brenleyre, 7724; Folliéran, 7685; and the Vanil Noir, 7825. The last is the highest elevation in the canton, and is situated in the south on the Bernese frontier to the right of the valley of the Sarine. The western and north-western districts belong to the system of the Jorat or Jurten, the most important massif being Mount Gibloux, which attains an altitude of 3945 feet. Besides the Sarine there are two considerable streams which flow partly through Freiburg territory,—the Singine or Sense, which, deriving one of its head streams from Freiburg and the other from Bern, forms throughout the greater part of its course the boundary between the two cantons, and the Broye or Brux, which rises in the south-west near Semsales, and after traversing the outskirts of Freiburg and Vaud enters the Lake of Morat or Murten, and thus finds its way to the Lake of Neuchâtel. There are a few small lakes in the canton, the most noteworthy being that of Seedorf, which was lowered about 11 feet by draining operations undertaken in 1871–73 for reclaiming the marshy land around it. Mineral waters occur at Lac Noir or Schwarzsee, at Wyler-vor-Bad, at Montbarry near Gruyère, and at Bonn not far from the town of Freiburg. Out of a total area of about 340,705 acres, about 9880 may be regarded as unproductive, 57,432 are occupied by forests, upwards of 84,100 furnish pasture, 91,876 are meadow land, 104,925 are arable fields, and 675 are vineyards. The forests are of great value to the canton, firewood and timber being among its principal exports. Though the cereals are pretty extensively cultivated, the production of grain is far under the consumption. Tobacco is an important article in the commerce of the canton, and the manufacture of *Kirschwasser* is widely distributed. The district of Gruyère, extending from the Singine to the Veveyse, is famous for its cheese, of which upwards of 49,000 cwts. is produced annually. With the exception of tanning and straw plaiting there are no industries that give employment to any great number of people; but there are glass works at Semsales, a paper mill at Marly, and kilns for hydraulic lime at Tour de Trême and Chatel, and watches are made at Morat and Montilier. The canton is divided into seven districts or prefectures, and there are 277 communes and 118 Catholic and 8 Protestant parishes. The district of the Sarine numbers 25,544 inhabitants, and includes the capital of the canton; the district of the Singine, lying towards the east, numbers 16,375, and has its administrative centre at Tavers or Tafels; the district of the Gruyère, to the south of those already named, has 19,337 inhabitants, and includes the chief town Bulle, with the ancient palace of the bishops of Lausanne, Tour de Trême, Vuadens, with a model cheese-dairy, Gruyère, with the old manor of its counts, Marsens, the seat of the cantonal lunatic asylum, the convent of Valsainte, the monastery of Pont-Dieu, and the castle and village of Corbières; the district of the Lake numbers 14,839 inhabitants, and its chief town is Morat, the scene of the famous battle of 1476; the district of the Glane has 13,176 inhabitants, and its chief town is Romont, with an ancient castle and ramparts and towers; the district of the Broye has 13,706 inhabitants, and its chief town is Estevayer, a busy little place on the Lake of Neuchâtel, to which it sometimes gives its name; and lastly, in the far south the district of Veveyse numbers 7855, and besides its chief town, Châtel-St.-Denis, contains the village of Semsales. The canton is traversed from north-east to south-west by the railway from Bern to Lausanne; another line proceeds from the town of Freiburg westward by the Lake of Neuchâtel, and a third unites Romont and Bulle. Freiburg returns, according to its population, six representatives to the national council of Switzerland. Its own administration consists of a great council, to which a member is furnished by every 1200 inhabitants, a state council of seven members, and a judicial council of nine. According to the census of 1870, out of a total population of 110,900, 94,000 were Catholics and 16,800 Protestants, the latter being most numerous in the district of the Lake. The Catholics are under the jurisdiction of the bishop of Lausanne, who has his residence at Freiburg. Though the official language is French, which is generally spoken in the towns, public documents are also published in German, which holds its ground in the district of the Singine, in part of the district of the Lake, and in the commune of Bellegarde in Gruyère. In the rest of Gruyère, as well as in the districts of the Veveyse, the Glane, the Sarine, and the Broye, a patois of the French stock is the prevailing speech.

History.—The history of Freiburg practically begins with the counts of Zähringen, who, under the emperors, held considerable possessions in this part of Switzerland. In 1179 Berthold IV. founded the town of Freiburg, as his uncle Berthold III. had already been the founder of Freiburg in the Breisgau, and as his son and successor was not long afterwards to be the founder of Bern. He not only bestowed on it all the territory which he held for three leagues round—a district afterwards known as the "old lands," or the "twenty-four parishes," but he also, by a charter or *Handfeste*, granted a number of privileges similar to those of Cologne, which in that unsettled period soon attracted what was then a considerable population of artisans, peasants, and traders from the neighboring countries. On the death of Berthold V., the last duke of Zähringen, in 1218, his possessions passed to his sister Anne, wife of Ulrich of Kyburg; and the Kyburgs were accordingly lords of Freiburg till 1264, when they also became extinct in the male line. Anne of Kyburg, who had married Eberhard of Hapsburg, sold Freiburg to Rudolph of Hapsburg for 3000 marks; and thus the town was subject to the house of Austria for 188 years. During that long period it had to fight many a battle for its existence, more especially against the neighboring town of Bern and the counts of Savoy. At length abandoned by Austria, it was obliged in 1452 to swear fidelity to Louis of Savoy, to whom it had become indebted for vast sums of money. In spite of all the difficulties of its position, it was in this first part of the 15th century that it maintained a considerable trade with France, Italy, and Venice in its leather and cloth. As many as 18,000 or 20,000 pieces of cloth were stamped with the town's seal in the course of a year. The reign of the Savoy dynasty was of short duration, for when Yolande, widow of Amadeus, entered into alliance with Charles the Bold of Burgundy, Freiburg joined Bern against the Burgundians, and took part in the battles of Morat and Grandson. At length, in the diet of Stanz in 1481—thanks mainly to the advocacy of Brother Claus (Nicholas von der Flüh)—it was admitted a member of the Swiss Confederation. Considerable additions of territory were effected in the 15th and 16th centuries. In 1475 Illens, Planfayon, and the castle of Chenaux were acquired, and, along with the Bernese, the people of Freiburg wrested Morat from the house of Savoy. In 1478 the lordship of Montagny was purchased for 6700 florins, and in 1482 Farvagny and Pont. Bellegarde was added in 1502, Wallenbuch in 1504, Font in 1508, and in the course of 1536 Vuippens, Estevayer, Corserey, Bulle, Vuissens, Châtel St. Denis, Bossonnens, Surpierre, Romont, Rue, La Molière, and St. Aubin. Corbières was bought for 8000 florins in 1553; and in 1555 Bern and Freiburg forced Michel, the last count of Gruyère, to abdicate, and paid 80,500 crowns for his countship. The people of Freiburg had to endure very heavy taxation to raise their proportion of the sum. Meanwhile, in the 16th century, the original democratic government gave place to an exclusive oligarchy, which succeeded in maintaining its supremacy in spite of the pretensions of the papal power and the bishop of Lausanne on the one hand, and the dissatisfaction of the people on the other. The French occupation of 1798 brought its government to a close; but in 1814 it was partially restored, 108 of the 144 seats of the great council being assigned to members of the patrician families. On December 2, 1830, the people rose and demanded equality of rights for all the citizens of the canton; and in January, 1831, a democratic constitution was drawn up, and a representative government established. In 1846 Freiburg joined the Sonderbund, and in the following year it was consequently invaded by the federal forces. In 1848 the constitution was revised and rendered more liberal in regard to religious matters. Several attempts were made by the Catholic party to recover their supremacy; but their efforts were defeated, and Bishop Marilley and other of their leaders were exiled. In 1857, however, the great council decided for another revision of the constitution in a reactionary sense, and their proposal was adopted by the people. Since then there has been no alteration of the general tendency, and the Catholic clergy are in possession of unbounded influence.

See Berchthold, *Geschichte Freiburgs*; Lalive d'Épinay, *Étrennes fribourgoises pour les années 1806–1809*, Freiburg, 1810; *Sammlung der Gesetze, Decrete, etc., der Regierung des Cantons Freiburg, 1803–17*; A. Bourqui, *Notions sur la Constitution politique du pays*; Alex. Daguet. *Illustrations fribourgeoises*; *Nouveaux Souvenirs de Frieburg*, by F. P., Freiburg, 1868; *Géographie du Canton de Fribourg à l'usage des écoles primaires*, 1877; *Receuil diplomatique du Canton de Fribourg*, published by the Cantonal Historical Society.

Freiburg, the chief town of the above canton, with a station on the line between Bern and Geneva, occupies a highly picturesque situation in the valley of the Sarine, part of it lying in the bottom of the ravine and part of it climbing the irregular eminences on the left. It is divided into four districts—the Bourg or central town, the Quartier des Places or the upper town, and the districts of the Auge and the Neuveville, which, together with the Planche, constitute the lower town. The principal ecclesiastical building of Freiburg, the collegiate church of St. Nicholas, commenced about 1283 and finished in the second half of the 15th century, is worthy of notice, not only for the noble belfry 245 feet in height, but also for the organ, which was constructed between 1824 and 1834 by Aloys Mooser, a native of the town, and is one of the most famous instruments of its kind. The various buildings belonging to the municipal and cantonal Governments, the conventual establishments of the Cordeliers, the Ursuline nuns, and other fraternities and sisterhoods, the college of St. Michel and the lyceum, with the cantonal museum, and the civic hospital and other beneficent institutions, are the most important of the public edifices. In front of the town-hall grows a linden tree which is said to have been planted by a soldier from the battle of Morat, 22d June, 1476. The ravine of the Sarine is crossed by several bridges, of which the most notable is the suspension bridge constructed by M. Challey about 1834, which has a span of 871 feet, and consists mainly of four cables each composed of 1056 distinct wires, individually not more than a tenth of an inch in diameter. About three miles to the north of the town, the river valley is crossed by the great railway viaduct of Grandfey, which dates from 1862, is a girder structure 1095 feet in length and 260 feet high, contains about 3100 tons of metal, and cost 2,500,000 francs. Immediately above the town a vast dam was thrown across the river-bed by Ritter the engineer in 1871–3; and the fall thus obtained yields a water power of from 2600 to 4000 horse-power. A motive force of 600 horse-power secured by turbines in the stream is conveyed to the plateau of Pérolles by "telodynamic" cables more than 2295 feet in length, for whose passage a tunnel has been constructed in the rock of the ravine. The industrial establishments are still comparatively few and unimportant. Population in 1870, 10,904.

FREIBURG, or **Freyburg**, usually distinguished as Freiburg in the Breisgau, is a city formerly of the Austrian dominions but now in the grand-duchy of Baden, about 12 miles E. of the Rhine, at the foot of the Schlossberg, one of the heights of the Black Forest range. It is one of the stations on the railway between Basel and Mannheim, and lies about 40 miles northwards from the former city. The town is for the most part well built, having several wide and handsome streets and a number of spacious squares. It is kept clean and cool by the waters of the Dreisam, which flow through the streets in open channels; and its old fortifications have been replaced by public walks, and, what is more unusual, by vineyards. Since 1827 Freiburg has been the seat of an archbishop who has authority over the bishops of Mainz, Fulda, Rottenberg, and Limberg; and it possesses a famous Catholic university, the *Ludovico Albertina*, which owes its origin to Albert VI., archduke of Austria, and dates from 1454, 1456, or 1457. This was at one time a very wealthy institution, having been endowed by its founder with extensive lands in the Breisgau, Upper Alsatia, and Würtemberg; but since the French Revolution it has lost nearly all its estates, and the revenue derived from those still held in Baden is not sufficient for its expenses. In 1876 it had 41 professors, ordinary and extraordinary, and 9 privat-docenten, and the students numbered 290, of whom 141 were foreigners. The library contains upwards of 250,000 volumes; and among the other auxiliary establishments are an anatomical hall and museum and botanical gardens. The Freiburg minster is considered one of the finest of all the Gothic churches of Germany, being remarkable alike for the symmetry of its proportions, for the taste of its decorations, and for the fact that it may more correctly be said to be finished than almost any other building of the kind. The period of its erection probably lies for the most part between 1122 and 1252; but the choir was not built till 1513. The tower, which rises above the western entrance, is 386 feet in height, and it presents a skilful transition from a square base into an octagonal superstructure, which in its turn is surmounted by a pyramidal spire of the most exquisite open work in stone. In the interior of the church are some beautiful stained glass windows, both ancient and modern, the tombstones of several of the dukes of Zähringen, statues of archbishops of Freiburg, and paintings by Holbein and by Hans Balding, surnamed Grün. Among the other noteworthy buildings of Freiburg are the palaces of the grand duke and the archbishop, the town-hall, the theatre, the *Kaufhaus* or merchants' hall, a 16th-century building with the front painted red, the Protestant church, formerly the church of the abbey of Thennenbach, removed thither in 1839, the hall of art and harmony, and the barracks, erected by the Austrian Government in 1776, and capable of containing 5000 men. The charitable institutions include a foundling hospital, an orphan asylum, a blind asylum, and a military hospital. In the centre of the fishmarket square is a fountain surmounted by a statue of Duke Berthold III. of Zähringen, the founder of the city; in the Franciskaner Platz there is a monument to Schwarz, the traditional discoverer of gunpowder; the Rotteck platz takes its name from the monument of Rotteck, the historian, which formerly stood on the site of the Schwarz statue; and in Kaiser Wilhelm Strasse a bronze statue was erected in 1876 to the memory of Herder, who in the early part of the 19th century founded in Freiburg an institute for draughtsmen, engravers, and lithographers, and carried on a famous bookselling business. On the Schlossberg above the town there are massive ruins of two castles which were destroyed by the French in 1744; and about two miles to the N.E. stands the castle of Zähringen, the original seat of the famous family of counts. Situated on the ancient road which runs by the Höllenpass between the valleys of the Danube and the Rhine, Freiburg early acquired commercial importance, and it is still the principal centre of the trade of the Black Forest. It manufactures chicory, chemicals, starch, leather, tobacco, silk thread, paper, and hempen goods, as well as beer and wine. The population is rapidly increasing. In 1864 it numbered 19,085, inclusive of the suburbs of Herdern and Wiehre, and in 1875 no less than 30,531. About a sixth of the whole are Protestants.



Plan of Freiburg in Baden.

1. Hospital.
2. Evangelical Church.
3. Art Hall.
4. Barracks.
5. St. Martin's Church.
6. Franciscan Monastery.
7. Chemical Laboratory.
8. University.
9. Museum.
10. Cathedral or Minster.
11. Merchants' Hall.
12. Archbishop's Palace.
13. Grand-Ducal Palace.
14. Theatre.
15. Town Hall.
16. Post Office.
17. Barracks.
18. Town Hospital.
19. Rotteck's Monument.
20. Convent.

Gates—A. Martin's Thor; B. Schwaben Thor; C. Breisacher Thor.

Freiburg was founded, as has been already stated, by Count Berthold III. of Zähringen. In 1120 it became a free town, with privileges similar to those of Cologne; but in 1219 it fell into the hands of a branch of the family of Urach. After it had vainly attempted to throw off the yoke by force of arms, it obtained its freedom in 1366 for a sum of 20,000 silver marks; but as it was unable to reimburse the creditors who had advanced the money, it was, in 1368, obliged to recognize the supremacy of the house of Hapsburg. In the 17th and 18th centuries it played a considerable part as a fortified town. It was captured by the Swedes in 1632, 1634, and 1638; and in 1644 it was seized by the Bavarians, who shortly after, under General Marcey, defeated in the neighborhood the French forces under Enghien and Turenne. The French were in possession from 1677 to 1697, and again in 1713–14 and 1744; and when they left the place in 1748, at the peace of Aix-la-Chapelle, they dismantled the fortifications. The Baden insurgents gained a victory at Freiburg in 1848, and the revolutionary Government took refuge in the town in June, 1849, but in the following July the Prussian forces took possession, and did not leave till 1851.

See Schreiber, *Geschichte und Beschreibung des Münster zu Freiburg*, 1820 and 1825; *Geschichte der Stadt und Universität Freiburgs*, 1857–59; *Der Schlossberg bei Freiburg*, 1860.

FREIBURG, distinguished as Freiburg unter dem Fürstenstein, a garrison town in the government district of Breslau, Silesia, is situated on the Polsnitz, 35 miles S.W. of Breslau. Its industries include the making of regulator watches, linen weaving, starch manufacture, and distilling. A higher burgher school was erected in 1874. In the neighborhood are the old and modern castles of the Fürstenstein family. At Freiburg on July 22, 1762, the Prussians defended themselves successfully against the superior forces of the Austrians. The population of the town in 1875 was 7853.

FREIDANK, FREIGEDANK, or in Middle High German VRÎDANC, the name by which a certain German didactic poet of the 13th century is usually known. It has been disputed whether the word, which is equivalent to freethought, is to be regarded as the poet's real family name or only as a pseudonym; according to Pfeiffer the former is the case. Little is known of Freidank's life. He certainly accompanied Frederick II. on his crusade to the Holy Land, where a portion at least of his work was composed; and it is said that on his tomb (if indeed it was not the tomb of another Freidank) at Treviso there was inscribed, with allusion to the character of his style, "he always spoke and never sang." Wilhelm Grimm started the hypothesis that Freidank was to be identified with Walther von der Vogelweide; but it found almost no acceptance from other German scholars, and was formally refuted by Franz Pfeiffer in his *Zur Deutschen Literatur-Geschichte*, Stuttgart, 1855, and his *Germania*, 1857, 2d vol.

Freidank's work bears the name of *Bescheidenheit, i. e., Discretio*, Correct Judgment, and consists of a collection of proverbs, pithy sayings, moral reflections, and stories arranged under general heads. Its popularity till the end of the 16th century is shown by the great number of MSS. still extant; and Sebastian Brandt published it again and again in modified forms. Wilhelm Grimm's edition of *Vridances Bescheidenheit* appeared at Göttingen in 1834, and Bezzinberger's at Halle in 1872; the old Latin translation, *Fridangi Discretio*, was printed by Lemcke at Stettin, 1868; and there are two translations into modern German, A. Bacmeister's, Reutlingen, 1861, and Simrock's, Stuttgart, 1867. Compare also H. Paul, *Ueber die Ursprüngliche Anordnung von Freidank's Bescheidenheit*, Leipsic, 1870.

FREILIGRATH, FERDINAND (1810–1876), a popular German poet, was born June 17, 1810, at Detmold, where his father was a teacher in the Stadtschule. He was educated at the gymnasium of his native town, and at the age of fifteen was apprenticed to an uncle who kept a grocer's shop in Soest. Freiligrath had no great liking for trade. He was an insatiable reader, especially of books of travel and adventure, and from his childhood a scribbler of verse. At Soest he devoted some hours daily to the study of English, French, and Italian, and towards the end of his five years' apprenticeship was writing verses for several small Westphalian papers, such as the *Gunloda* and *Mindener Sonntagsblatt*. Having spent other five years (1831–6) as clerk in a bank at Amsterdam, Freiligrath returned to Soest, published his translations of Victor Hugo's *Odes* and *Twilight Songs* (1836), and started, conjointly with his friends Ignaz Hub and A. Schnezler, a journal, entitled *Rheinisches Odeon* (1836–8). In 1837 he went to Barmen as bookkeeper in a mercantile house, about which time also his fugitive pieces, still appearing in Westphalian papers, among which were the *Morgenblatt* and *Deutscher Musenalmanach*, had the good fortune to be praised by the poet Chamisso. A year later appeared his first volume of *Gedichte*, which became immediately and widely popular. Finding himself at the age of twenty-eight one of the favorite poets of his day, Freiligrath now gave up his situation of bookkeeper in Barmen, and spent the next year at Unkel on the Rhine, where he wrote his *Roland's Album* (1840), and in connection with Levin Schücking compiled *Das malerische und romantische Westfalen* (1840–42). He married in 1841 Ida Melos, daughter of Professor Melos of Weimar, and removed first to St. Goar, where, with his friends Simrock and Matzerath, he edited the *Rheinisches Jahrbuch* (1840–41), and in 1842 to Darmstadt, where he published, conjointly with Duller, a poem, *Zum Besten des Kölner Doms*, and endeavored also to start a periodical, to be called *Britannica: für Englisches Leben und Englische Literatur*, for which Dickens and Bulwer had promised their assistance. This scheme, however, failed, and Freiligrath returned to St. Goar, there to complete his *Karl Immermann, Blätter der Erinnerung an ihn* (1842). In the same year he received a pension of 300 thalers from King William IV. Up to this time, Freiligrath's poetry had borne no trace of the politician. Among the *Gedichte*, so popular in German households, were his *Moos-thee, Die Auswanderer, Der Blumenrache, Prinz Eugen, Der Bilderbibel, Löwenritt*, and many others written before 1840, all purely imaginative in their character, and still, from a literary point of view, unquestionably the poet's masterpieces. When, after his return to St. Goar, Freiligrath was drawn irresistibly into the political controversies of the day, he still endeavored to keep clear of party feeling, declaring that the poet stood "*auf einer höheren Warte als auf den Zinnen der Partei*." But he was soon obliged to vacate this position and descend among the politicians; and in 1844 he threw up his royal pension, published his *Glaubensbekenntniss*, and finally joined the democratic party. From this time forward he boldly proclaimed the democratic cause in verse, till, as the author of *Trotzalledem* (a translation of Burns's *A Man's a Man for a' that*), *Jacta est Alea, Die Freiheit! Das Recht!, Hamlet, England an Deutschland*, and other equally daring effusions, he was forced to seek safety in exile, and retired first to Belgium and then to Switzerland. There he prepared for press a volume of *Englische Gedichte aus neuerer Zeit* (1846), containing translations from Mrs. Hemans, L. E. L., Southey, Tennyson, Longfellow, and others, and also a volume of political songs entitled *Ça Ira!* The publication of this last led to his flight to England, and for the next two years he lived in London, as foreign correspondent to a mercantile house. In 1848 he was on the point of emigrating with his family to America, there to join Longfellow and other literary friends, when the Revolution broke out, and the amnesty of March 19 allowed him to return to Germany. He now took up his post at the head of the democratic party at Düsseldorf, but was shortly afterwards imprisoned on account of his poem *Die Todten an die Lebenden*. On being liberated by verdict of the jury, he removed to Cologne, to assist in the management of the *Neue Rheinische Zeitung*. During this year also he published his *Februarklänge* and *Die Revolution*. *Zwischen den Garben, eine Nachlese älterer Gedichte*, appeared in 1849, and *Neue politische und sociale Gedichte* in 1850. Fresh impeachments drove Freiligrath again to London in 1851, and he once more returned for a livelihood to the prosaic existence of the desk and office-stool, still, however, devoting his leisure hours to literature, and specially to those translations from the English poets which in Germany have earned him a position equal to Rückert's as a translator of English verse. In 1854 he published a selection of translations from English, Scotch, and Irish literature, entitled *The Rose, Thistle, and Shamrock*; also *Dichtung und Dichter, eine Anthologie*. His translation of Longfellow's *Hiawatha* appeared 1857. He also translated *Cymbeline* and the *Winter's Tale* for a German edition of Shakespeare, edited by Bodenstedt. In 1866 a national testimonial, which ultimately reached the sum of 60,000 thalers, was set on foot in Germany, for the purpose of providing a pension for the poet in his old age; and when, two years later, a general amnesty was granted to political offenders, Freiligrath returned to his native country, and was received with public enthusiasm. He now settled in Stuttgart, where, at the beginning of the Franco-German war, he wrote some since popular songs, such as *Hurrah Germania!* and the *Trompete von Gravelotte*. He removed to Cannstadt in 1875, and died there, March 18, 1876. An edition of his collected works was published at Stuttgart (6 vols. 1870, 2 vols. 1871, and since) and there is also a Tauchnitz edition, containing a selection of some of Freiligrath's best known poems, translated into English by various authors, and edited by his daughter Mrs. Freiligrath Kroeker (1869 and 1871).

Powerful as Freiligrath's poetry is, and masterly as his diction and rhythm are admitted to be, he is yet wanting in the tenderness of a Chamisso, or the exquisite subtlety of a Heine. The principal charm of his poetry lies in its entire originality. He came, belonging to no school of versifiers, at a time when old tastes were being cast off, and novelty was restlessly desired, and he has been fitly christened a *bahnbrechendener Poet*. He was original in style of thought and choice of subject, while in many of his poems, such as his *Iceland Moss Tea, Skating Negro, Revenge of the Flowers, Lion's Ride*, and many of his grim, revolutionary parables, there is even an element of the fantastic—the bizarre. And it was a part of this native originality of mind which made Freiligrath so eminently a cosmopolitan poet. He was no traveller, and spent the greater part of his days in a dusty counting house; yet, few as his sources of inspiration could have been,—he himself acknowledges the old *Bilderbibel* of his childhood as one, while others have traced them to the busy docks and strange cargoes of a seaport town,—his fancy was rarely contented with lingering among the scenery and legends at home, but branched rather into new paths, into the distant parts of the earth,—into the *Weltferne*. This love of the *Weltferne*, however, predominates only in his earlier *Gedichte*, to which the intense patriotism of his later muse is a strange contrast. In England Freiligrath's political poetry is of secondary interest; for to the British intellect it is scarcely comprehensible how such effusions—grim, outspoken, as they are—should be a sufficient cause for imprisonment, or an almost life-long exile; and as poems of occasion—although that occasion was a revolution—they rank lower with the literary critic than the purely imaginative poetry of his youth. But by most Germans Freiligrath is best remembered as the political poet; while among the countrymen of his own party, old political friends and fellow exiles, he has been called a poet-martyr, the "bard of freedom," and "inspired singer of the revolution." (F. M.)

FREIND, John (1675–1728), English physician, was born in 1675 at Croton in Northamptonshire. He made great progress in classical knowledge under Dr. Busby at Westminster, and at Christ Church, Oxford, under Dr. Aldrich, and while still very young, produced, along with Foulkes, an excellent edition of the speeches of Æschines and Demosthenes on the affair of Ctesiphon. After this he began the study of medicine, and having proved his scientific attainments by various treatises was appointed professor of chemistry at Oxford in 1704. In the following year he accompanied the English army, under the earl of Peterborough, into Spain, and, on returning home in 1707, wrote an account of the expedition which attained great popularity. Two years later he published his *Prelectiones Chimacæ*, which he dedicated to Sir Isaac Newton. In 1711 he was elected fellow of the Royal Society. Shortly after his return in 1713 from Flanders, whither he had accompanied the British troops, he took up his residence in London, where he soon obtained a great reputation as a physician. In 1716 he became fellow of the college of physicians, of which he was chosen one of the censors in 1718, and Harveian orator in 1720. In 1722 he entered parliament as member for Launceston in Cornwall, but, being suspected of favoring the cause of the exiled Stuarts, he spent half of that year in the Tower. During his imprisonment he conceived the plan of his most important and valuable work, *The History* *of Physic*, of which the first part appeared in 1725, and the second in the following year. In the latter year he was appointed physician to Queen Caroline, an office which he held till his death, 26th July, 1728. A complete edition of his Latin works, with a Latin translation of the *History of Physic*, edited by Dr. Wigan, was published in London in 1732. A monument was erected to Freind in Westminster Abbey.

FREIRE, Francisco Joze (1713–1773), a Portuguese historian and philologist, was born at Lisbon in 1713. He belonged to the monastic society of St. Philip Neri, and was a zealous member of the literary association known as the Academy of Arcadians, in connection with which he adopted the pseudonym of Candido Lusitano. He contributed much to the improvement of the style of the Portuguese prose literature, but his endeavor to effect a reformation in the national poetry by a translation of Horace's *Ars Poetica* was less successful. The work in which he set forth his opinions regarding the vicious taste pervading the current Portuguese prose literature is entitled *Maximas sobre a Arte Oratorio*, and is preceded by a chronological table forming almost a social and physical history of Portugal. His best known work, however, is his *Vida do Infant D. Henrique*, which has given him a place in the first rank of Portuguese historians. He also wrote an account of the great earthquake of 1775, and his *Réflexions sur la Langue Portugaise* was published in 1842 by the Lisbon society for the promotion of useful knowledge. He died in 1773.

FREISCHÜTZ is, in German folklore, a marksman who by a compact with the devil has obtained a certain number of bullets destined to hit without fail whatever object he wishes. As the legend is usually told, six of the *Freikugeln* or "free bullets" are thus subservient to the marksman's will, but the seventh is at the absolute disposal of the devil himself. Various methods were adopted in order to procure possession of the marvellous missiles. According to one the marksman, instead of swallowing the sacramental host, kept it and fixed it on a tree, shot at it, and caused it to bleed great drops of blood, gathered the drops on a piece of cloth and reduced the whole to ashes, and then with these ashes added the requisite virtue to the lead of which his bullets were made. Various vegetable or animal substances had the reputation of serving the same purpose. Stories about the Freischütz were especially common in Germany during the 14th, 15th, and 16th centuries; but the first time that the legend was turned to literary profit is said to have been by Apel in the *Gespensterbuch* or "Book of Ghosts. It has become universally known as the basis of Weber's opera *Der Freischütz* (1821), the libretto of which was written by Friedrich Kind, who had suggested Apel's story as an excellent theme for the composer. The name by which the Freischütz is known in French is Robin des Bois. According to some mythologists, the legend is to be traced back to the great solar myth.

See Kind, *Freyschützbuch*, Leipsic, 1843; *Revue des Deux Mondes*, February, 1855; Grässe, *Die Quelle des Freischütz*, Dresden, 1875.

FREISING, Freysing, or Freisingen, a town of Bavaria, district of Upper Bavaria, is situated on the Isar, 20 miles N.N.E. of Munich. It has breweries, distilleries, dyeworks, sawmills, and machine factories. Among the principal buildings are the cathedral (famous for its crypt), erected in the end of the 12th century, the town-hall, the lyceum, and the gymnasium. Freising is a very ancient town, and is said to have been founded by the Romans. It at any rate existed as early as 444 A.D., and was made the seat of a bishop in 724. In 1802 the bishopric was united to the newly-created archbishopric of Munich, whose occupant bears the title of Freising as well as Munich. The population of Freising in 1875 was 8252.

FREIWALDAU, a town in Austrian Silesia, circle of Troppau, is situated in a pleasant valley 40 miles W.N.W. of Troppau. It was formerly a protection-town of the archbishopric of Breslau, and possesses an old castle and a large church. Its industries are linen and cotton weaving, flax-spinning, and wax-bleaching. About a mile and a half distant is the well-known hydropathic establishment of Gräfenberg. In 1869 the population of Freiwaldau, including suburbs, was 5242.

FRÉJUS, the ancient *Forum Julii*, a town of France, department of Var, about a mile from the Mediterranean, and 15 miles S.E. of Draguignan. It is the seat of a bishop, and has some handsome modern buildings, among which are the cathedral and the episcopal palace, both of Gothic architecture, and constructed partly of the remains of Roman edifices. It possesses manufactures of cork and soap, and among the minerals of the neighborhood are coal, pumice stone, porphyry, jasper, and amethyst. Fréjus took its name from Julius Cæsar, who is said to have established a Roman colony there. It was improved by Augustus, and in the time of the subsequent emperors it became an important naval station. Among the remains of the ancient town are a triumphal arch, a ruined amphitheatre, traces of two moles which formed the entrance of the port, and portions of a fine aqueduct, which brought the waters of the Siagne into the town from a distance of 20 miles. Traces of the old walls of the town are also visible. The port, which communicated with the sea by means of a canal, has been dried up, and its site is now occupied by gardens. At St. Raphael, a fishing village about a mile and a half distant, Napoleon disembarked on his return from Egypt in 1799, and re-embarked for Elba in 1814. The population of Fréjus in 1876 was 2791. See Texier, *Mémoires sur la ville et le port de Fréjus*, 1847.

FREMONT, a city of the United States of America, capital of Sandusky county, Ohio, is situated on the Sandusky river at the head of navigation, 30 miles east of Toledo by rail. Steamers ply between the city and the principal ports of Lake Erie, and it has manufactories of woollens, sashes, and blinds, flour mills, and engineering works. The late Mr. Burchard bequeathed to the city land for two public parks, and $50,000 for a public library, the building for which is to be erected on the Fort Stephenson property, the scene of the gallant and successful defence of General Crogher against a superior force of the British and Indians, August 1st and 2d, 1813. The population of Fremont in 1870 was 5455.

FRENCH, Nicholas (1604–1678), an Irish political pamphleteer, was born in Wexford in 1604. After receiving ordination at Louvain, he became Roman Catholic priest at Wexford, and in 1643 he was appointed bishop of Ferns. Having taken a prominent part in the political disturbances of this period, he deemed it prudent, after the universal submission which followed the storming of Wexford by Oliver Cromwell, to retire to Brussels, where, in 1652, he published his attack on Ormond, entitled *The Unkind Deserter of Loyal Men and True Friends*, and shortly afterwards *The Bleeding Iphigenia*. The most important of his other pamphlets is the *Sale and Settlement of Ireland*. Shortly before his death, which took place August 23, 1678, he was nominated coadjutor-archbishop of Ghent. The *Historical Works* of Bishop French, comprising the pamphlets above named and several others, were published at London in 1846 in 2 vols., and a notice of him will be found in T. D. M'Gee's *Irish Writers of the 17th Century*, London, 1846.

FRERE, John Hookham (1769–1841), an English diplomatist and author, was born in London, May 21, 1769. His father, John Frere, a gentleman of a good Suffolk family, had been educated at Caius College, Cambridge, and would have been senior wrangler in 1763 but for the powerful competition of Paley; his mother, daughter of Mr. John Hookham, a rich London merchant, was a lady of no small ability and culture, accustomed to amuse her leisure with the pleasures of versification; and his father's sister Ellinor was married to Sir John Fenn, the learned editor of the *Paston Letters*, and contributed with her own pen to the formation of a library of fiction for children. Young Frere was sent to Eton in 1785, and there began that intimacy with Canning which so greatly affected his after life. From Eton he went to his father's college at Cambridge, and graduated B.A. in 1792 and M.A. in 1795. He entered public service in the foreign office under Lord Grenville, and sat from 1796 to 1802 as member of parliament for the close borough of Looe in Cornwall. From his boyhood he had been a warm admirer of Pitt, and along with Canning he entered heart and soul into the defence of his Government, and contributed freely to the pages of the *Anti-Jacobin*. On Canning's removal to the board of trade in 1799 he succeeded him as under secretary of state; in October, 1800, he was appointed envoy extraordinary and plenipotentiary to Lisbon; and on September, 1802, he was transferred to Spain, where he remained for two years. He was recalled on account of a personal disagreement he had with the "Prince of Peace," but his conduct was approved by the ministry, and in 1808 he was again sent out as plenipotentiary to Ferdinand VII. The condition of Spain rendered his position a very responsible and difficult one, but had it not been for one unfortunate step he would have left the country with greatly increased reputation. When Napoleon began to advance on Madrid it became a matter of supreme importance to decide whether Sir John Moore, who was then in the north of Spain, should endeavor to anticipate the occupation of the capital or merely make good his retreat, and if he did retreat whether he should do so by Portugal or by Galicia. Frere was strongly of opinion that the bolder was the better course, and he urged his views on Sir John Moore with an urgent and fearless persistency that on one occasion at least overstepped the limits of his commission. After the disastrous retreat to Corunna, the public accused Frere of having by his advice endangered the British army, and though no direct censure was passed upon his conduct by the Government, he was called home, and the Marquis of Wellesley was appointed in his place. Thus ended Frere's public life. He afterwards refused to undertake an embassy to St. Petersburg, and twice declined the honor of a peerage. In 1816 he married Elizabeth Jemima, dowager countess of Erroll, and in 1820, on account of her failing health, he went with her to the Mediterranean. There he finally settled in Malta, and though he afterwards visited England more than once, the rest of his life was for the most part spent in the island of his choice. In quiet retirement he devoted himself to various literary labors, studied his favorite Greek authors, and taught himself Hebrew and Maltese. His hospitality was well known to many an English guest, and his charities and courtesies endeared him to his Maltese neighbors; and when he died in 1841, his loss was evidently regarded by rich and poor as a common calamity.

Frere's literary ability was early displayed. He was a contributor at Eton to the school magazine known as the *Microcosm*, and gained the members' prize at Cambridge in 1792 by an essay on the strange question, "Whether it were possible to hope for improvement in morals and the cultivation of virtue in the rising republic of Botany Bay?" During the first period of his public life he was one of the chief writers in the *Anti-Jacobin*, contributing, among other pieces, "The Loves of the Triangles," a clever parody of Darwin's "Loves of the Plants," and sharing with Canning the honor of "The Needy Knife-Grinder" and "The Rovers." In 1817 he published a mock-heroic poem entitled, *Prospectus and Specimen of an intended National Work by William and Robert Whistlecraft, of Stow-Market, in Suffolk, Harness and Collar makers, intended to comprise the most interesting particulars relating to King Arthur and his Round Table.* It attracted considerable attention at the time, and though it was afterwards comparatively forgotten, it served to bring again into fashion the octave stanza of the Italians, and formed, as far at least as its versification was concerned, the acknowledged model of Byron's *Beppo*. Much greater importance attached to the translations of Aristophanes, by which indeed Frere occupies an almost unrivalled position in English literature. The principles according to which he conducted his task were elucidated in an article on Mitchell's *Aristophanes*, which he contributed to *The Quarterly Review*, vol. xxiii. The translations of *The Acharnians*, *The Knights*, *The Birds*, and *The Frogs* were privately printed, and were first brought into general notice by Sir G. Cornewall Lewis in the *Classical Museum* for 1847. They were followed some time after by *Theognis Restitutus, or the personal history of the poet Theognis, reduced from an analysis of his existing fragments.* Frere's complete works were published in 1871, with a memoir by his nephews, W. E. and Sir Bartle Frere, and reached a second edition in 1874. Compare also an article in the *North American Review*, vol. cvii., 1868.

FRÉRET, NICOLAS (1688–1749), a French scholar, one of the most learned men of his age, was born at Paris, February 7 or 15, 1688. His father was *procureur* to the parliament of Paris, and destined him to the profession of the law. His passion for knowledge declared itself almost from his birth; and so early did he apply himself to studies of the most diverse kind, and accumulate vast stores of information, that he scarcely seemed to have any childhood. His precocity in learning and literary labor appears to rival even that of John Stuart Mill. He had for his tutors the historian Rollin and Father Desmolets. Amongst his early studies history, chronology, and mythology held a prominent place. To please his father he studied law and began to practise as a pleader; but the force of his genius soon carried him into his own path. At nineteen he was admitted to a society of learned men who sought more freedom of discussion than was to be had within the Academy, and he read before them memoirs on the religion of the Greeks, on the worship of Bacchus, of Ceres, of Cybele, and of Apollo. The astonishing reputation which he gained for learning, and the influence of the eminent men whose friendship he enjoyed, opened the way for his recognition by the Academy. He was hardly twenty-six years of age when he was admitted as pupil to the Academy of Inscriptions. One of the first memoirs which he read was a learned and critical discourse *Sur l'Origine des Français*. His views, well-grounded, unusual, and audacious, excited great indignation in the Abbé Vertot, who had written on the same subject in a manner more flattering to the vanity of Frenchmen, and he denounced Fréret to the Government as a libeller of the monarchy. A *lettre de cachet* was issued, and Fréret was sent to the Bastille. He was thus silenced on the perilous subject, and his memoir even remained unpublished till nearly fifty years after his death. During his six months of confinement—"a solitude," he says, "whose tranquillity there was nothing to disturb"—he devoted himself to the study of the works of Xenophon, the fruit of which appeared later in his memoir on the *Cyropædia*. The assertion, frequently repeated, that he was allowed to read nothing but Bayle's famous *Dictionary*, and that he nearly learnt it by heart and imbibed all its scepticism, is entirely untrue and unjust. From the time of his liberation in June, 1715, his life was uneventful. It was a life of the most simple, pure, and complete devotion to knowledge, with absolute indifference to fame. In January, 1716, he was received associate of the Academy, and in December, 1742, he was made perpetual secretary. He lived and labored without intermission for the interests and the honor of the Academy, not even claiming any property in his own writings, which almost all remained unpublished till after his death. The list of his memoirs occupies four columns of the *Nouvelle Biographie Générale*. They treat of a large variety of subjects, chiefly in the fields of history, chronology, geography, mythology, and religion. Throughout he appears as the keen, learned, and original critic; examining into the comparative value and credibility of documents, distinguishing between the mythical and the historical, and separating traditions with an historical element from pure fables and legends. He rejected the extreme pretensions of the chronology of Egypt and China, and at the same time controverted the scheme of Sir Isaac Newton as too limited. He investigated the mythology not only of the Greeks, but of the Celts, the Germans, the Chinese, and the Indians, and was a vigorous opponent of "euhemeristic" interpretation. He was one of the first scholars of Europe to undertake the study of the Chinese language: and in this he was engaged at the time of his committal to the Bastille. In addition to these labors and acquirements Fréret made himself master of modern literature, and was intimately acquainted with the dramatic works of the French, Italian, English, and Spanish poets. His multifarious pursuits left him no time for carrying on the publication of the *Mémoires* of the Academy, an enormous arrear of which had to be made up by his successor. He died at Paris, March 8, 1749.

Long after his death several works of an atheistic character were falsely attributed to him, and were long believed to be his. These were the *Examen critique des apologistes de la religion chrétienne* (1766), *Lettre de Thrasybule à Leucippe*, printed in London about 1768, and a few others. They were republished under the title of *Œuvres philosophiques* in 1776. It is now believed that they were put forth in Fréret's name by Holbach, Naigeon, and Lagrange, and that Fréret had nothing whatever to do with them. A very defective and inaccurate edition of Fréret's works was published in 1796–1799. A new and complete edition was projected by Champollion-Figeac, but of this only the first volume appeared (1825). His manuscripts, after passing through many hands, were deposited in the library of the Institute.

FRÉRON, ÉLIE CATHERINE (1719–1776), a French critic and controversialist, was born at Quimper in 1719. He was educated by the Jesuits, and made such rapid progress in his studies that before the age of twenty he was appointed professor at the college of Louis-le-Grand. On resigning his connection with the Jesuits in 1739, he was employed by the Abbé des Fontaines as a contributor to his *Observations sur les Écrits Modernes*. After the death of the latter in 1746 he founded a similar journal of his own, entitled *Lettres de la Comtesse de * * **. It was suppressed in 1749, but he immediately replaced it by *Lettres sur quelques écrits de ce temps*, which, with the exception of a short suspension in 1752, on account of an attack on the character of Voltaire, was continued till 1754, when it was succeeded by the more ambitious *L'Année Littéraire*. His death at Paris on the 10th March, 1776, is said to have been hastened by the temporary suppression of this journal. Fréron is now remembered solely for his attacks on Voltaire and the Encyclopedists, and the fame of his criticisms is not due to their inherent merits, which, notwithstanding a certain clever malignity, are very slight, but to the retaliations they provoked on the part of Voltaire, who, besides attacking him in epigrams, and even incidentally in some of his tragedies, directed against him a virulent satire entitled *Le Pauvre Diable*, and also made him the principal personage in a comedy *L'Écossaise*, in which the journal of Fréron is designated *L'Âne Littéraire*.

Besides conducting the serials already mentioned, Fréron is the author of *Ode sur la bataille de Fontenoy*, 1745; *Histoire de Marie Stuart*, 1742, in 2 vols.; and *Histoire de l'empire d'Allemagne*, 1771, in 8 vols. See Ch. Nisard, *Les Ennemis de Voltaire*, 1853; Despois, *Journalistes et journaux du XVIII*^{e} *siècle*; Barthélemy, *Les Confessions de Fréron*; Ch. Mouselet, *Fréron, ou l'illustre critique*, 1864; *Fréron, sa vie, souvenirs*, etc., 1876.

FRÉRON, Louis Stanislas (1765–1802), a French Revolutionist, son of the preceding, was born at Paris in 1765. His name was, on the death of his father, attached to *L'Année Littéraire*, which was continued till 1790, and edited successively by the Abbés Royou and Geoffroy. On the outbreak of the Revolution, Fréron, who was a schoolfellow of Robespierre and Camille Desmoulins, established the violent journal *L'Orateur du Peuple*. Commissioned along with Barras in 1793 to establish the authority of the Convention at Marseilles and Toulon, he distinguished himself equally with his colleague in the atrocity of his reprisals, but both afterwards joined the Thermidoriens, and Fréron became the leader of the *Jeunesse Dorée*. He then made his paper the official journal of the reactionists, and being sent by the Directory on a mission of peace to Marseilles he published in 1796 *Mémoire historique sur la réaction royale et sur les malheurs du midi*. He died in 1802 at St. Domingo, where he was for a few months subprefect.

FRESCO. Fresco-painting is the art of mural painting upon freshly-laid plaster lime whilst it remains damp, with colors capable of resisting the caustic action of the lime with which they are mixed or brought into contact. Fresco-painting might be called lime-painting, lime being the vehicle with which the colors are fixed, but the term would not be sufficiently distinctive, because colors mixed with lime may be applied under certain conditions to plaster which has been allowed to dry, an art which the Italians call painting "a secco," to distinguish it from "a fresco" or painting on newly-laid and still wet plaster. The art of painting with colors mixed with lime is very ancient; it was in use in Egypt from the remotest periods of the monumental history of that country; but as it was carried to perfection by the Italians, it is needless to trace its development elsewhere than in Italy, where the most primitive examples—those existing in Etruscan sepulchral chambers dug in tufa—are marked by technical peculiarities which survive in fresco-painting to this day. The walls of tufa were prepared by being whitewashed with lime,—a method revived in mediæval mural pictures; and the outlines of the figures were drawn with a metal point or stylus, and subsequently colored on the whitewash, which from the percolation of water through the tufa remained permanently damp. In examples at Chiusi this outline is found limited exclusively to the external forms of the figures, a custom which reappears in mediæval pictures of the school of the neighboring Siena, whilst drawing on wet plaster with the stylus belongs to this art in every age. The colors used were earths, which were mixed with lime and laid on in flat tints, and earths for the most part are the colors still employed in fresco-painting. The Romans, probably owing to Greek influence and example, carried the art much further than their Etruscan predecessors, and established real fresco-painting in Italy. Vitruvius remarks, "Colors when carefully applied on moist stucco do not therefore fade, but last for ever. Stuccoed walls, when well executed, do not easily become dirty, nor do they lose their colors when they require to be washed, unless the painting was carelessly done, or executed after the surface was dry." This is emphatically descriptive of fresco-painting. In this art it is essential that a given amount of plaster be laid for the painter at one time,—in modern practice only enough for a day's work,—and therefore frescoes are readily recognized by the joinings in the plaster, most frequently following the outlines of the figures or other objects. These joinings vary in distinctness in different works according to the skill of the plasterer. Sometimes they are clearly perceptible, at other times they are only discoverable on minute examination. It has been observed on painted walls in Pompeii that such joinings exist, but they are further apart and less frequent than in modern works generally, suggesting either that the ancient artists painted more rapidly, or that several worked together on the same sheet of plaster, or that they knew how to keep the plaster fresh for more than one day, which, considering their great technical skill, is not improbable. Such wide divisions are found in the fragments of a mural painting of the 14th century existing in Sta. Croce, and in others by Paolo Uccello, but this is explained by the completion of these pictures in distemper, whilst the Pompeian paintings are in fresco; for besides the joinings, which are not inconsistent with the presence of tempera, there are also marks showing the use of the stylus on damp plaster, and by experiments made by the late Sir Humphrey Davy, it has been shown that all the colors employed contain lime; therefore they are fresco and not tempera.

It may be doubted whether any works of art produced in later times could have withstood the trials to which the mural paintings of Pompeii have been subjected from the action of heat and damp, the latter for centuries, without serious damage. The expression of Vitruvius that they would last for ever has been so far justified. The processes of the ancients were not limited to fresco-painting; they were familiar with others of great beauty and durability, but these do not enter within the scope of the present notice. The construction of the walls and the system of plastering then in use are more important subjects of inquiry in connection with fresco. Those unsurpassed builders, the Romans, faced walls intended to be painted, with a lining of bricks set on edge, detached by a small space from the main structure, to which it was secured with leaden clamps. This was a precaution against damp well worthy of imitation. Generally, three preparatory coats of plaster were laid on this brick facing or on any other description of wall, the first consisting of lime mixed with pounded brick and pozzolana, the other two with lime and pozzolana. The finishing coat was frequently composed of lime and pounded marble, which was susceptible of an exquisite polish, after which it was painted by durable processes, the secret of which is now lost. For fresco-painting the last coat or intonaco consisted of lime mixed with sand only. A long gap now occurs in the progress of mural painting. Its practice is feebly illustrated in tombs and catacombs, interesting historically, but of little value technically. Finally it was displaced for a time by mosaic, but it was again revived in the 13th century, that great epoch of the resuscitation of the fine arts. The works of Giunta Pisano and some of his contemporaries in the upper church of St. Francis at Assisi, executed in the first half of the 13th century, clearly indicate a knowledge of a system of fresco. In a history of the practice of this art these mural paintings, with those of Cimabue and his colleagues or assistants, and those by Giotto and his followers, deserve special consideration. They illustrate the early processes of fresco and mural painting upon which all the methods subsequently followed were based. It is evident from the structure of the interior of the beautiful upper church of St. Francis that the architect did not provide for its being painted internally. It was complete in its admirable masonry, and when it was determined to paint it, the only preparatory process possible was to cover the aslar with a thin coat of intonaco about one-eighth of an inch in thickness. Any plan of preparatory coats of plaster in the Roman manner would have buried the string courses and other mouldings, and ruined the proportions of the piers. True fresco-painting under such conditions was consequently very difficult, for the thin intonaco, laid on a stone wall which could not be soaked with water, of necessity dried rapidly. The mixed art of fresco and distemper which was thus made imperative at Assisi prevailed in mural painting, with certain modifications, for a long period everywhere.

The following is a brief statement of the methods of Giunta Pisano and Cimabue. Both artists practised, if they did not inaugurate, the system of outlining their subjects on the walls, which continued for two centuries, till it was abandoned for the better plan of preparing cartoons. A sketch was first made, and was squared in the usual manner with vertical and horizontal lines drawn to scale. The space to be painted was then squared proportionately, and, guided by the squares, the artist outlined his subject full size with charcoal on the wall. This done, with a hair pencil and some ochre mixed with water he passed over the general lines, and then brushed off the charcoal; he next marked in the entire composition with red "terra rossa" mixed with water only, this time entering more into detail, and even indicating the chiaroscuro. Where the ancient intonaco has fallen off, these red outlines are visible; they have a mysterious grandeur, and those by the hand of Cimabue prove the possession on his part of freedom and power of drawing. Over these outlines the intonaco was spread in portions, and on it the artist marked the squares once more, and drew the outlines of the figures he meant to paint. That the intonaco was prepared in sections is proved, not only by the visible lines in the plaster, but also by the falling off of the leg of a figure, showing the cut made by the artist when he had finished his work. The cut follows the outline of the limb, and this process suffices to show that fresco-painting was practised in the first half of the 13th century, if any doubt should be entertained. The intonaco being spread, the artist painted his subject in a slight manner with terra rossa, laying in the chiaroscuro and details, after which the plaster was allowed to dry. The picture thus prepared was then colored in distemper, and completed in every part. By the aid of Vasari and of Cennino Cennini a pupil of the school of Giotto, who completed his treatise on painting on the 31st July, 1437, we have clear statements of the methods of mural painting followed by the Byzantine artists, and subsequently by the Italians. Cennino, in the most express terms, states that mural pictures, although commenced in fresco, were *always* finished in distemper. The distempers used were a mixture of egg, including both the albumen and the yolk, with the milky fluid which exudes from twigs of the fig tree; size made from glue or from gum tragacanth is also mentioned. A list of the colors employed by Giotto and his pupils and successors is given below; and the same, there can be little doubt, were in use on the part of Giunta, of Cimabue, and their contemporaries. Amongst these white lead played an important part in painting on panels and on walls. All who are familiar with old pictures must have frequently seen those of black Madonnas and saints, held in especial veneration for their sanctity and antiquity. The colors with which they were painted were freely mixed with white lead and with the yolk and albumen of egg, which darkens whilst the white lead oxidizes; hence their present state.

This partially explains the singular appearance presented by the mural pictures of Giunta at Assisi, in which the shadows are red executed in fresco, and the lights painted in distemper are black. The explanation is not entirely satisfactory, however, for the change is not universal, and in a considerable number of the pictures the colors have not changed; but wherever damp has penetrated, the paintings have become very dark; the microscope would probably show that this is due to the presence of fungus, the produce of the egg distemper. As the works attributed to Cimabue are for the most part in better preservation than those given to Giunta, they suggest that this great artist, who did so much for design, also improved the technical processes of mural art. He undoubtedly carried fresco-painting further, although on thin intonaco; but he prepared for the finishing processes as his predecessors had done. This statement is based upon the examination of a Madonna and Child with Angels in the lower church of St. Francis, which is executed in the same manner as the pictures in the upper church ascribed to Giunta. This fragment is so noble in design, the heads are so beautiful, the whole work is so much better than the picture of the Borgo Allegri, now in St. Maria Novella, Florence, that although in its method it is like the works of Giunta, in design it is far beyond his powers. Cimabue's method of outlining on the wall has been described; but there are traces of his use of the stylus, to which he had recourse when he wished to alter an outline after the work was begun, and it is therefore evident that the plaster was damp when he had recourse to this instrument. His preparations in fresco being dry, he proceeded to paint the shadows of flesh with terra vert in distemper, and then modelled the features with the requisite colors. That he heightened the lights with white lead is apparent, for these have become black even in places which damp did not reach. A glaring example of this is the table-cloth in a picture of the Marriage at Cana in Galilee, which, once white, is now an intense black; the plates, viands, and vases upon it are unchanged in color; these no doubt are in pure fresco, which explains the difference.

We can form no idea now of the splendid appearance which the paintings in the interior of St. Francis presented when newly done. There are abundant traces of the use of a mordant for gilding, showing that the high lights upon dresses and the edges of folds were gilt, as well as embroideries on the borders, and on the aureoles of saints. It is obvious that such ideas were derived from mosaics, in which the lights sparkle with gold. Regarded simply as decorative art, these paintings at Assisi, with their clear bright coloring, the rich gilding, and with the windows filled with colored glass, must have been magnificent. The art was very conventional, still the beginnings are perceptible of a higher imitative system, and of a growing appreciation of truth to nature. The heads of angels are characterized by expressive beauty; the bride in the Marriage at Cana has a very pleasing face, and even the idea of portraiture is observable; the look of surprise in the countenance of the husband is naturally expressed, and with good taste. Those who have not seen these paintings, and only judge of the merits of Cimabue by his altar-pieces at Florence, can have little conception of the ability of this remarkable artist.

Beneath the paintings of Cimabue, and under the gallery which represents a triforium, range the mural pictures of Giotto and his contemporaries or pupils. By Giotto the art of fresco received a new impetus; he continued the mixed method then prevalent, but with a more moderate use of distemper, and laid the foundation of the system carried to perfection by his greatest successors. The part of the wall which was assigned to him apparently admitted of thicker plastering, for he caused preparatory coats of plaster to be spread with due care; on the last of these, when dry, he no doubt made his outlines according to the manner of his predecessors, and over these the intonaco was distributed with singular dexterity. Plastering in his time was a branch of fine art, so that it is at all times difficult to discover the joinings in the works of Giotto and his followers. An account of his method of mural painting will convey a clear idea of the technical processes improved by him and followed by other artists after him.

The lime prepared for the intonaco having been kept till it had parted with much of its caustic quality, was mixed with sand in the proportion of two of sand to one of lime. The pigments used were:—White—biancosangiovanni, or lime carefully ground with pure water and dried in the sun in the form of cakes; black—charcoal of vinewood, a black chalk, or lamp black; red—cinabrese, a red earth of intense color, and sinopia, a lighter red, also an earth, and burnt ochre; amatista—not now known by this name, but a fine purple red; green—terra vert; yellow—two qualities of ochre, dark and light, and giallolino, which resembled Naples yellow in tone. This is a very moderate palette, but it was supplemented by the colors subsequently applied in distemper. These were orpiment, cinabro (a red oxide), German blue (apparently a cobalt), vermilion, lake, verdigris, indigo, and white lead. When the picture was commenced in fresco, particular grounds were laid on the wet plaster in preparation for the colors which were to follow: for instance, the sky to be painted blue in distemper was prepared with a deep red (cinabrese)in fresco. The virgin's blue robe was first grounded with black mixed with red, and then painted with blue mixed with size prepared from glue, for red of egg would have made it green. The blue, however, has frequently become a bright green, spite of this care. There are numerous examples of these methods in pictures, extending from the age of Giotto to that of Raphael. In a painting by Lippo Memmi at Assisi a dark rich red in distemper is laid over a preparation of light red in fresco. By Ghirlandajo a brown robe has been colored in tempera over pale gray in fresco. The dark purple robe of the Cardinal Bonaventura in the fresco called the Dispute on the Sacrament, by Raphael, is spread over a preparation of red. Many other cases might be cited were it necessary. The most singular of all was the preparation for painting trees and bushes by a ground in fresco of black, on which the leaves, branches, sprays, buds, and flowers were executed of the proper colors in distemper. Illustrations of this custom are observable in pictures by Orcagna, Pietro Laurati, Simone Memmi, Masolino, Paolo Uccello, and many other artists; it did not survive the 15th century, and it is due to Masaccio to point out that he appears to have been the first to escape from this commonplace conventionality.

The methods of mixing colors and tints and their use in painting were reduced to system, whether for painting drapery or the nude. It was usual to prepare three pots of each color carefully graduated. Thus, for instance, in the preparation of a flesh tint, a certain quantity of lime, biancosangiovanni, was mixed with red; in another pot the same red, with much more lime; two equal portions of these tints were mixed in the third pot: thus three equal gradations were secured. A head, hand, or any part of the body being drawn on the wet plaster with fine lines with the brush, the shadows were painted with terra vert, then, the lightest flesh tint being taken, the lights were put in. This done, the middle tint was applied, the junctions between the two tints being carefully softened; next the darker color was laid in, all these tones being fused together in a proper way. The operations were repeated till sufficient solidity —impasto—was obtained. Another and much lighter tone served to mark the high lights, such as those on the nose, chin, and parts of the ears; lastly, the small and most brilliant points of light were touched with pure white, and the whites of the eyes were painted. The artist next outlined the nostrils, eyelids, and apertures of the ears with black, touched in the lower eyelids and the eyebrows with shades of sinopia, and with the same color the nostrils, upper lip, and the line between the lips. The hair was broadly shaded with terra vert, and washed over with light ochre; then the locks were defined with dark ochre, and the lights pencilled with a much lighter tint of the same; lastly, the outlines were strengthened with sinopia. Such usually were the methods pursued by Giotto and his followers. It is evident that painting thus, according to a fixed system, a master and his trained pupils could act together and harmonize their work in a manner otherwise unattainable. At the same time the individuality of the artist was not obliterated by this prevalence of rule. In the frescoes attributed to Giotto and his followers or compeers, it is not difficult to distinguish the different handiwork. In some the green shadows are modified with a warmer tint; in others the results are cold and formal; some paint with soft gradations, others in a harder manner, but the difference between the artists is still more observable in the drawing and proportions of the figures. As guiding cartoons were not prepared by the master, probably the assistants or pupils were only provided with his sketches, which they enlarged on the wall with such skill as they possessed; hence the varieties of proportion which are so remarkable.

Draperies were painted with graduated colors prepared in the same way; the lights, according to the usage of the Tuscan school, were heightened with pure white, and the shadows were glazed with washes of unmixed color, showing that the intonaco must have been damp when these were applied or they would not have adhered. Thus in these pictures the most important part of the work was pure fresco, whilst the tempera, although undoubtedly used, was less freely applied by Giotto than by his master Cimabue and his predecessors, judging from the mural paintings at Assisi. To the taste and genius of Giotto was owing this great improvement in the technical processes of mural painting.

The architectural details, where they occur as accessories or backgrounds, are carefully drawn and painted with infinite grace, and as architectural designs they are singularly beautiful, especially in the works of Giotto. It is true that they are invariably too small in proportion to the figures,—a peculiarity which they probably owe to the imitation of similar adjuncts in ancient Roman bassi-rilievi. The conventional routine of thus designing backgrounds lasted for rather more than a hundred and fifty years. There is an appearance of perspective, showing observation, but no knowledge of optical laws. The method was in every respect analogous to that which regulated the drawing of very similar details in ancient Roman art.

These mediæval mural pictures in Italy place painting much more upon an equality with the sister arts of architecture and sculpture than was the case in other parts of Europe; they exhibit intense thought, sentiment, and ascetic religious expression. They have not the weird grandeur and sublimity of the designs of Cimabue, nor do they show efforts like his to represent ideal beauty; but they approach much more nearly towards the representation of familiar nature, and the expression of human emotion. Still this art was conventional; of the infinite and beautiful variety of inanimate nature, or of its effects of sunshine and shade, the artists had no perception whatever.

The idea that painting possessed such a power had not yet been awakened; but at the beginning of the 15th century a genius was born who led it into new paths, and exercised a good influence upon it, which produced the most beneficial results. Tommaso da San Giovanni, called Masaccio, was this great painter. Another artist, at the present time of a more widespread reputation, divides the honors of the first portion of the 15th century with Masaccio, to whom, however, he was far inferior in originality or perception of nature's variety and beauty. This was Fra Beato Angelico (see FIESOLE). He continued the technical processes of the artists of the preceding century, and in his work mediæval painting culminated and became perfect technically; but before he left the scene of his loving labors he was so far influenced by the rising wave of the revival that he abandoned Gothic forms in his accessories for timid imitations of classic architecture.

In practice Fra Beato adhered to the last to the precepts of the older school, but with a freshness of color, a beauty of form, and a grace of manipulation all his own. He finished his mural pictures with solid distemper of such peculiar excellence—very probably employing gum tragacanth, so insoluble is the mixture—that it remains comparatively unchanged; and he transmitted to his successors the old schemes of preparatory grounds in fresco for the subsequent finishing coats in tempera, which for so long a period characterized monumental art. This is observable in many of his numerous works, and especially in his great mural painting of the Crucifixion in the chapter house of St. Mark's, Florence. In conformity with traditional custom, he laid in the sky in deep red in preparation for blue, which, however, has never been applied. It is to be regretted that the pious artist did not finish this his most important work, but it illustrates in a very remarkable way how far he carried fresco before having recourse to distemper.

The great and gifted painter Masaccio relinquished the precepts which had guided his predecessors and were practised by his contemporary Fra Beato, as he departed from their methods of composition, drawing, and chiaroscuro. His insight into the true appearances of nature was that of genius, and he painted these with fidelity, and not conventionally, like the older masters. His art was a revelation: he burst through the routine by which painting had hitherto been bound; it may be said that he anticipated all that was to be done after him, and that no artist, however great, of those who followed him could escape finding in the works of this wonderful originator anticipations of his own qualities as an artist. They were studied as models by the greatest artists of succeeding times, by Michelangero, and by Raphael, who imitated him to the extent of plagiarism. Standing before the frescoes of Masaccio we are introduced to new rules destined at a future time to regulate the practice of the art. No frescoes hitherto painted had been so pure; they are not entirely free from retouching in distemper, but this was reduced to a minimum, yet with the attainment of a richness of color and a force of chiaroscuro never surpassed. Masaccio could paint the effects of sunlight with extraordinary power and brilliancy; when he chose he could rival the finish and refinement of Leonardo da Vinci; he created the art of characteristic portraiture, whilst he could rise to a lofty ideal. He shadowed forth the power of form of Michelangelo, the natural dignity of Raphael, the brilliant chiaroscuro of Correggio, and the rich color of Titian. He cast behind him the conventional pattern-like landscape of his predecessors, and hinted at a new and true idea of representing scenery. Technically he painted with an impasto and a freedom hitherto unthought of, except by his reputed master Masolino da Panicale, who had sufficient insight in moments of his existence to escape from formalism and to feel the influence of nature. It is not to be wondered at that with such qualities as these Masaccio's frescoes should have been objects of study and admiration to generations of artists. An aberration in modern criticism and a fantastic and somewhat weak devotion to mediæval forms give a transient preference to the works of his devout contemporary; but in those of Masaccio the great principles of the revival rise brilliantly above the horizon; in those of Fra Beato the ideas of the Middle Ages set with pure and tranquil ray.

With the advancement of the art of painting we have a discreditable decline in the requisite structural preparations, which has produced disastrous effects on many noble works of art. Frescoes were only too frequently painted upon ill-built rubble walls, with unequal surfaces, which were not brought to a level by careful preparatory coats of plaster. This is unfortunately exemplified in the frescoes of Masaccio. The results of uneven surfaces are the accumulation of dust on the pictures and of other impurities, seldom removed, and the removal of which is accompanied by a certain risk. The careful structure of the Romans was known to their Italian successors, and was described by Leon Battista Alberti and other architects, but apparently with little effect. It is absolutely necessary that walls intended to be painted upon should be very carefully constructed; the Pompeian system is excellent, and to it may be added thin beds of asphalt at the bases and summits of the stone or brick work. It must never be forgotten that damp is a deadly enemy to fresco-painting, and that unequal surfaces are unsightly as well as destructive.

The history of mural painting may next be illustrated by reference to the works of Benozzo Gozzoli. As a pupil of Fra Beato Angelico it might be expected that he would continue to use distemper painting extensively, and such was the case. Greatly excelling his master in power of drawing, although with less sentiment, endowed with prolific fancy and capable of unwearied exertion, he has left very important mural pictures, which were begun in fresco, but were so entirely finished with distemper as to be in fact distemper pictures. The joinings of the intonaco in his works present a somewhat unusual appearance. They are for the most part carefully concealed, but in one of his compositions at Pisa they are very observable, and they are invariably cut at some distance from the outlines of the figures; they are not unlike the joints between the polygons which form an Etruscan wall. Thus they include considerable portions of the background. Other artists, notably Masolino, and at a later period Michelangelo, frequently included parts of the background in the day's painting, which artists will readily recognize as, where possible, important in principle. The objection, however, is obvious. The joinings which do not follow the outlines disfigure the surface, unless carefully concealed by the help of distemper painting, which in modern times would be considered objectionable. When the paintings are so far from the eye that the joinings are invisible, as in the Capella Sistina, the method is valuable. Towards the close of the 15th century Filippino Lippi in his works further illustrates the history of mural painting. He was employed to finish Masaccio's fresco in the Brancacci Chapel, representing the Raising of the King's Son, and he showed himself to be in every respect worthy of the honorable commission. He painted in the centre of the picture a group of eight figures, the heads of which in truth to nature and refined execution literally never have been excelled. He lacks the force of Masaccio; he did not see the effect of sunlight in the same way; he rather painted twilight; but he introduced into fresco a variety in the management of flesh tints and grace of technical execution which unfortunately diminished in his later works. These were his characteristics when he painted in competition with Masaccio. His method was also to prepare the draperies of the figures in fresco, and then to glaze them copiously with distemper color. Whilst Masaccio invariably painted hands in fresco, Filippino as invariably painted them in tempera over the draperies. This may have saved trouble, but was not otherwise commendable. It is to be remarked that apparently he first shaded them with terra vert like the mediæval painters, subsequently adding the flesh tints. Domenico Ghirlandajo follows as an important and very able mural painter. He also commenced his works in fresco, in which he painted admirably with a large effective manner combined with finish. He used distemper extensively; and as an unctuous glazing has been found upon frescoes by his brother Rodolfo, it is possible that a new process of retouching was introduced by these brothers. It may have been in their studio that Michelangelo when a boy learnt to retouch fresco in tempera; he undoubtedly retained in his method some impressions derived from his first teachers.

Pietro Perugino excelled in the art of fresco-painting as it was understood in his time. His works illustrate two very different methods. He painted in pure fresco; and it may be observed that, whilst his oil pictures are marked by such rich and powerful coloring, some of his frescoes are like delicate water-color drawings. A glance at the wall paintings of Masaccio would have shown him how far color can be obtained in fresco. No doubt he had his motives, and when he wished to produce force and color, like all other artists of the time he had recourse to retouching in distemper. His famous frescoes in the Sala del Cambio at Perugia, are thus retouched all over, and consequently the usual and unequal darkening of the colors has taken place. They have force, but they have lost all brilliancy, and they illustrate in a remarkable way the inexpediency of a manner of painting which would suffer from the mephitic atmosphere of a crowded place of meeting. Pure frescoes would have remained clear or could have been cleaned, whilst retouched frescoes darkened without remedy.

Another remarkable contemporary artist, Bernardino Pinturicchio may be said to have carried distemper painting over fresco to the most extravagant degree of any master of his time. He fell back on the primitive conventions of gilt rilievo ornaments in stucco in his paintings, on hatching with gold, and other barbaric splendors of early art. His mural pictures at Siena resemble illuminations in choral books. They are in excellent preservation, having escaped damp and bad air within the well-built library of the cathedral.

It is obvious that the progress made in oil-painting in the 15th century must have produced important effects upon fresco and ideas connected with it. Some oil painters transferred to their art the light brilliancy of wall painting, and notably Michelangelo in his oil picture for Angelo Doni. Leonardo da Vinci estimated more justly the capabilities of the more powerful vehicle. Tempera, after a brief struggle, sank before it, and disappeared from amongst the processes of art, whilst in mural painting the habits long prevalent of retouching and glazing with strong distempers were confirmed for a time, and new methods were invented to make fresco rival the splendor and force of oil. It is to be regretted that it was not seen that this could be adequately attained, as had been demonstrated by Masaccio, with little aid from extraneous means. Leonardo da Vinci evidently thought that fresco-painting was unequal to produce the effects which he desired, and he executed his great mural picture of the Battle of Anghiari in encaustic, and his still more celebrated work, the Last Supper, in oil, with what disastrous results need not be recorded here except as a warning to artists to avoid methods not sanctioned by experience and not tested by time.

A period is now reached, the close of the 15th and first years of the 16th centuries, when modifications were made in the technical preparations for fresco. Benozzo Gozzoli was probably one of the last of the artists who drew the outlines of his mural pictures upon the preparatory coat of plaster. Writers upon fresco have only noticed one illustration of this custom in the ruins of a fresco by Pietro di Orvieto at Pisa, but it was a generally established method from the 13th to the close of the 15th century.

The account which we have in Vasari of the preparation of the cartoons by Leonardo da Vinci and Michelangelo for their rival mural pictures in the hall of the municipal palace of Florence brings the history of fresco-painting to an important epoch. The execution of such full-size drawings, and of the previous sketches and studies requisite under the circumstances, involved an amount of thought and care hitherto little contemplated. The drawings in red on walls or rough plaster were freely executed with little study, and were not calculated to improve the artist's skill in the delineation of form; but the preparation of the cartoon was for art the most important step ever taken towards the cultivation of mastery in design, and to the acquisition of that profound knowledge of form which characterized the great painters of the first part of the 16th century, the golden age of art. The cartoonist first prepared his sketch on a small scale, then made his studies from nature, either in separate drawings or in a general delineation of the entire composition. In like manner he considered accessories and details, and made careful studies of drapery. Some artists modelled the whole subject so as to observe the light and shade. This done, the paper for the cartoon was stretched and squared. Pupils were sometimes employed to transfer the sketches to this the working drawing. How carefully such cartoons were sometimes executed is described in the most interesting manner in the history of that famous one which Michelangelo drew with such infinite pains. The wall to be painted was then squared like the cartoon, which was cut into pieces of a convenient size, and so was fitted by the help of the squares to the freshly laid intonaco. The outline was then transferred to the yielding plaster either by the help of the pounce bag, the cartoon having been pricked, or it was marked through the paper with the stylus. It is profoundly interesting to observe the different methods followed by the old masters in preparing the outline. The two greatest of all, Michelangelo and Raphael, were scrupulously careful. They transferred the forms to the wet intonaco with the pounce, after which Michaelangelo marked them in some places with a very sharp cutting point. Soddoma, a great painter, was on the contrary very careless in the preparation of his cartoon and its transfer to the plaster. He frequently altered the drawing whilst painting. Bernardino Luini was content with mere indications of the contours. Pordenone indicates a fiery spirit in his mode of dashing them in with any sharp instrument at hand.

The history of the practice of fresco painting now reached its apex in the works of Michelangelo and Raphael; those of a long line of great mural painters have illustrated in various ways most of the technical processes of this difficult but noble art. Michelangelo was unwilling to paint; he remarked to Pope Julius, "It is not my profession;" yet his frescoes may be taken as perfect types of what ought to be aimed at by every practitioner, so far as method is concerned, apart from the retouching in distemper. The following apparently was his mode of painting. The local color was laid on and modelled into the cool shadow—(the use of terra vert in shadow had now disappeared, and gray taken its place)—with that perfect knowledge of form and truth of gradation habitual to Michelangelo, and observable in all his drawings. The lights were then painted with a full brush and softened into the half tints; then the darker parts of the shadows were added. It is observable in the execution of this great artist that he modelled the color in fresco with all the breadth and impasto which slow drying oil paint makes possible. This distinguishes at a glance his work from that of his assistants, which is laboriously stippled. It has been ascertained beyond a possibility of doubt that Michelangelo was not satisfied with pure fresco-painting; but he did not repaint with distemper,—he merely glazed with a thin coating of a blackish gray mixed with size, which he applied in some places with washes, in others with stippling. This is very different from the older methods of painting over the fresco with solid distemper color.

In the celebrated mural paintings of Raphael in the Vatican changes of method are very observable; yet it may reasonably be inferred that the great artist's wish was to paint in pure fresco. A century before the execution of these works, Masaccio had shown what great results could be achieved without having recourse to extensive retouchings, and Raphael carefully studied his frescoes. In his exquisite early fresco in San Severo in Perugia he showed that he adhered to these principles. In his famous Vatican frescoes he at first partially adhered to the mixed method: besides moderate retouching in the usual manner, he prepared by a coat of red in fresco for painting blue in distemper; but when he executed the noble picture of the School of Athens, he evidently desired to get rid of this old system, and he painted the blues without preparation on the damp intonaco. It was well known from an early period of the art that ultramarine resisted the caustic action of lime. Whatever the blue which Raphael used on this occasion, it has faded more than the other colors in the picture, which is therefore now out of harmony, and his experiment so far failed. At other times the contrary result is observable. In the Aurora by Guido it is the other colors which have faded, and the blues are now too strong, showing that ultramarine if carefully prepared stands better than other colors. Guercino is the artist who has introduced blue in pure fresco with most technical skill, and consequently his works retain a harmony which is very rare. Raphael evidently aimed at pure fresco-painting, but may have been dissatisfied with the results; for he allowed the greatest latitude to his pupils, who employed distemper and apparently other vehicles copiously, when executing portions of their master's works. When he died, charged as they were with the completion of the Stanze, and provided with his designs, they at once commenced on one of the walls of the Hall of Constantine to paint in oil, as if they had been converted by their master's rival Sebastian del Piombo. Such was the admiration excited by these works that Cardinal Dovizza da Bibbiena wrote,—"The pupils of Raphael have executed a specimen of a figure in oil on the wall, which was a beautiful work of art, so much so that no one would look at the rooms painted in fresco by Raphael."

These were idle discussions and idle experiments; each branch of art has its field of operation, and it is to be regretted that the old masters generally were not satisfied with the effect of pure fresco-painting. Masaccio triumphantly illustrated its true powers. In the Brancacci chapel at Florence the perfection to which the noble art may be carried without extraneous aid is amply illustrated. In the efforts made to give fresco the richness of color and force of chiaroscuro of oil-painting, its finest qualities were in fact destroyed. In the attempt there is a manifest confusion of ideas. Fresco-painting is in a special manner the handmaiden of architecture, with which it harmonizes and to which it adapts itself in a manner from which oil-painting seeks to escape. Oil-painting asserts itself, fresco aims rather to adorn and complete the architecture with which it is associated; but its history shows that not all artists understood its true limits or its real mission.

Some lessons taught us by the results now ascertainable of the technical processes of the old masters may be summed up. The importance of careful construction of the wall so as to prevent the action of damp is evident. Undoubtedly the best walls are those of brick with facings in the ancient Roman manner. The ruinous consequences of badly constructed roofs have been shown by the state of the mural paintings at Assisi. That pure fresco is a much more durable art than the mixed method of fresco and distemper-painting is obvious. Of distempers used, those containing animal matter are the worst, especially that prepared from eggs, for when they are assailed by damp, black fungi spread over such pictures and ruin them. It is needless now to point to the disastrous results which must follow the use of white lead; for as a pigment in tempera-painting its great defect is known to all artists. The employment of pozzolana in the preparatory coats of plaster may appear to be favorably supported by ancient examples. Pozzolana is a volcanic ash, which, mixed with lime, forms the famous Roman cement, and has admirable qualities; but it must not be forgotten how Michelangelo suffered from using it, and how mould spread on his frescoes. The ancient masters prepared intonaco in two ways,—with lime and sand, and with lime and marble dust. If the sand used is quartz, the mixture is insoluble, and the fresco painted upon it will be permanent. If marble dust, on the contrary, be preferred, as it was by many old masters from its beauty, it is soluble, and it facilitates the formation of sal nitre on the surface, a common enemy and a dangerous one of frescoes, for it destroys the colors. It is important that lightning conductors should be provided; as at Assisi the action of the electric fluid on the frescoes of the vaults, where it has played over the surface, has blackened them.

The Germans, who have done much for the restoration of fresco in the present century, have added to the list of colors formerly in use, and in doing so have been aided by modern chemistry. They have also experimentally fixed the time requisite for the preparation of the lime for the intonaco, and have greatly improved the structure of walls intended to be painted. They have restored the ancient method of lining walls internally with brick; they have interposed sheets of lead between the bases of those walls and the foundations, and prevent the descent of damp from above in the same way. They consider it enough to keep the lime to be used for from ten to twelve months, whether for the intonaco or for painting with; and the following is a list of the colors which they have added to those employed by the old masters:—Raw and burnt terra di siena, all kinds of burnt ochres, a lake-colored burnt vitriol, a purple burnt vitriol, raw and burnt umber, Cologne earth burnt forming an excellent black, chrome green, cobalt green, and for blue cobalt as now prepared, or imitations of it.

The frescoes of the Venetian masters, and those of Antonio Allegri da Correggio, add little to our knowledge of the technical processes of mural painting. As might be expected, the works of the Venetians, which are comparatively few in number, show more attention to color than to form, and they are slight in execution. The most brilliant are those by Paul Veronese, whose ideas of color and effect in a special manner fitted him to deal with the conditions of monumental art. Correggio illustrates, as might be expected, the magic effects of sunlight alternating with shade, and the beauty of form and feature which distinguish the immortal artist. Technically, his processes resemble those of other Italian masters, and his works have suffered in the same manner and from the same causes.

Enough, it is hoped, has been said to explain the processes of fresco-painting as practised by the greatest masters of the art. Some of these have led to their decay, but a combination of ignorance and carelessness on the part of the Italians themselves has been the chief cause of the widespread ruin of the greatest examples of the art of painting which the genius of any nation has produced.

Modern Fresco-Painting.—The practice of painting in fresco has been continued to the present time in Italy; it has been employed not only for the decoration of churches, public buildings, and private residences, but also for painting exteriors. The traditional habit of painting the exteriors of houses prevalent in Genoa and its neighborhood for centuries, and less frequently in other parts of Italy, still continues, although in a very inferior manner and by painters of a much more ordinary class than formerly. For the execution of interior work excellent fresco-painters are readily found, and the Italians of the present day are in no respect inferior to their predecessors in practical skill, however little they may equal them in the high characteristics of art. Modern Italian masters paint in pure fresco with much force of color, satisfactory execution, and excellent finish; they repudiate the old system of retouching with distemper colors, whilst apart from the practice of fresco they are probably the best painters in distemper in Europe. In this art they paint like the old masters with the egg vehicle, but as a separate art of mural painting, and never as an adjunct to fresco.

Towards the commencement of the present century several German artists resident in Rome studied the art of fresco with much zeal, and laid the foundation of the modern school of fresco-painters in Germany. Some of them acquired a great amount of technical skill, and followed the system of the old masters, by training pupils as assistants with satisfactory results, and thus were enabled to undertake public work with comparative facility and at a reasonable expense. As already noticed, they improved the art in important technical respects, as well as the structure of edifices to be painted, and settled the best methods for preparing the lime for plastering with, and for painting.

In France the art of fresco-painting has not been successfully developed. French artists who practise mural painting with great ability prefer oil or wax-painting, an ancient method which they as well as the Italians and Germans have with much care and ingenuity endeavored to revive. They have not been able to restore the ancient encaustic, but they have devised useful and beautiful modes of mural painting and decoration.

A zealous attempt was made in England to promote the art of mural painting in fresco, in connection with the decoration of the new Houses of Parliament in London. Careful inquiries were made in Germany and Italy, and a valuable amount of information was gathered and published; and, after various experiments, artists of distinction and ability were employed to paint in fresco in the House of Lords and in other parts of the new national edifice. Notwithstanding the difficulties which beset the artists in the practice of an art so new to their experience and so different from their usual habits and experience, a considerable amount of success was achieved, highly creditable to them and to their zeal and perseverance. But fresco-painting has not been domiciled in Great Britain, nor has any great school of mural painters been formed. The excellent artists employed did not form schools as in Germany or in Italy, or as in France in a different branch of art; and without the aid of trained assistants public painting is impossible at a cost which can be brought within reasonable limits.

Before the revival of fresco-painting in London, Mr. Zephaniah Bell, a Scottish artist, who had studied the art in Italy, painted some clever and forcible frescoes at Muirhouse, near Edinburgh, which after the lapse of about forty-five years are still, with the exception of the yellows, fresh and in excellent condition.

See Cennino Cennini, *Trattato della Pittura* (English translation by Mrs. Merrifield, 1844); Vasari, *Le Vite dei piu eccellenti Pittori, Scultori, e Architetti;* Eastlake, *Materials for a History of Oil Painting* (containing a brief essay on fresco-painting), 1847; C. Heath Wilson, "Report on Fresco-Painting," in the second *Report of the Commissioners of the Fine Arts*, London, 1843, and the same author's *Life and Works of Michelangelo Buonarroti*, 1876; also the *Reports* of the Commissioners on the Fine Arts, London, from 1842. (C. H. W.)

FRESCOBALDI, Girolamo, a celebrated musical composer, was born at Ferrara in 1587. Little is known of his life except that he studied music at his birthplace under Alessandro Milleville, and owed his first reputation to his beautiful voice. According to one account he went to Belgium, at that time still a centre of the art, where he is said to have lived till 1608, after which period he appears to have settled in Italy, at first in Milan, and from 1627 in Rome, where three years later he obtained the office of organist of St. Peter's Cathedral. At this period he had acquired great fame as a virtuoso on the organ, and according to Baini no less than 30,000 people flocked to St. Peter's on his first appearance there. He also excelled as a teacher, Frohberger, the celebrated German organist and precursor of Bach, being the most distinguished of his pupils. Frescobaldi's compositions show the consummate art of the early Italian school, and his works for the organ more especially are full of the finest devices of fugal treatment. He also wrote numerous vocal compositions, such as canzone, motets, hymns, etc., a collection of madrigals for five voices (Antwerp, 1608) being among the earliest of his published works. The year of his death is not sufficiently established. Fetis conjectures 1654.

FRESNEL, Augustin Jean (1788–1827), an illustrious French physicist, the son of an architect, was born at Broglie, in the department of Eure, in France, May 10, 1788. His early progress in learning was slow, and when eight years old he was still unable to read. At the age of thirteen he entered the École Centrale in Caen, and at sixteen and a half the École Polytechnique, where he acquitted himself with distinction. Thence he went to the École des Ponts et Chaussées. He served as an engineer successively in the departments of Vendée, Drôme, and Ille-et-Villaine; but his espousal of the cause of the Bourbons in 1814 occasioned, on Napoleon's reaccession to power, the loss of his appointment. On the second restoration he obtained a post as engineer in Paris, where much of his life from that time was spent. His researches in optics, continued until his death, appear to have been begun about the year 1814, when he prepared a paper on the aberration of light, which, however, was not published. In 1818 he read his celebrated memoir on diffraction, for which in the ensuing year he received the prize of the Academy of Sciences at Paris. He was in 1823 unanimously elected a member of the Academy, and in 1825 he became a member of the Royal Society of London, which in 1827, at the time of his last illness, awarded him the Rumford medal. In 1819 he was nominated a commissioner of lighthouses, for which he was the first to construct compound lenses as substitutes for mirrors (see Lighthouses). Fresnel died of consumption at Ville-d'Avray, near Paris, July 14, 1827. The undulatory theory of light enunciated by Hooke, and upheld by Huygens and Euler, but first founded upon experimental demonstration by Thomas Young, was extended to a large class of optical phenomena, and permanently established, by the brilliant discoveries and the mathematical deductions of Fresnel. By the use of two plane mirrors of metal, forming with each other an angle of nearly 180°, he avoided the diffraction caused in Grimaldi's experiment on interference by the employment of apertures for the transmission of the light, and was thus enabled in the most conclusive manner to account for the phenomena of interference in accordance with the undulatory theory. With Arago he studied the laws of the interference of polarized rays, and discovered that though when similarly polarized they affect each other as do ordinary rays, yet when rectangularly polarized they have no power of interference. Circularly polarized light Fresnel obtained by means of a rhomb of glass, known as "Fresnel's rhomb," having obtuse angles of 126°, and acute angles of 54°. His labors in the cause of optical science received during his lifetime only scant public recognition, and some of his papers were not printed by the Academy of Sciences till many years after his decease. But, as he wrote to Young in 1824, in him "that sensibility, or that vanity, which people call love of glory" had been blunted. "All the compliments," he says, "that I have received from Arago, Laplace, and Biot never gave me so much pleasure as the discovery of a theoretic truth, or the confirmation of a calculation by experiment." For further details as to the scientific achievements of Fresnel see ARAGO and OPTICS. His papers were published chiefly in the memoirs of the Academy of Sciences, the bulletins of the Société Philomatique, and the *Annales de Chimie*.

See Duleau, "Notice sur Fresnel," *Revue Ency.*, t. xxxix.; Arago, *Œuvres complètes*, t. i.; and Dr. G. Peacock, *Miscellaneous Works of Thomas Young*, vol. i.

FRESNILLO, a town of Mexico, in the state of Zacatecas, is situated 30 miles N.W. of Zacatecas, on a branch of the Santiago river, in the plain which divides the mountains of Santa Cruz and Deganos from the Zacatecas range. It is well built, and its streets are clean and regular. The country in the immediate neighborhood is pretty and fertile, and maize and wheat are cultivated. Fresnillo is noted chiefly for its silver mines situated at the adjacent knoll of Proaño. They were discovered in 1569, and for a long period have been the most productive in the country, the annual yield averaging more than £500,000. A school of mines was founded in 1853. Population about 15,000.

FRESNOY, CHARLES ALPHONSE DU (1611–1665), a painter and writer on his art, was born in Paris, son of an apothecary. He was destined for the medical profession, and well educated in Latin and Greek; but, having a natural propensity for the fine arts, he would not apply to his intended vocation, and was allowed to learn the rudiments of design under Perrier and Vouet. At the age of twenty-one he went off to Rome, with no resources; he drew ruins and architectural subjects. After two years thus spent, he re-encountered his old fellow student Pierre Mignard, and by his aid obtained some amelioration of his professional prospects. He studied Raphael and the antique, went in 1633 to Venice, and in 1656 returned to France. During two years he was now employed in painting altar-pieces in the château of Raincy, landscapes, etc. His death was caused by an attack of apoplexy followed by palsy; he expired at Villiers le Bel, near Paris. He never married. His pictorial works are few; they are correct in drawing, with something of the Caracci in design, and of Titian in coloring, but wanting fire and expression, and insufficient to keep his name in any eminent repute. He is remembered now almost entirely as a writer rather than painter. His Latin poem, *De Arte Graphica*, was written during his Italian sojourn, and embodied his observations on the art of painting; it may be termed a critical treatise on the practice of the art, with general advice to students. The precepts are sound according to the standard of his time; the poetical merits slender enough. The Latin style is formed chiefly on Lucretius and Horace. This poem was first published by Mignard, and has been translated into several languages. In 1684 it was turned into French by Roger de Piles; Dryden translated the work into English prose; and a rendering into verse by Mason followed, to which Sir Joshua Reynolds added some annotations.

FREUDENSTADT, a town of Würtemberg, circle of the Black Forest, on the right bank of the Murg, 42 miles W.S.W. of Stuttgart. It has a large square, a town-house, and a Protestant church of later Gothic architecture, with two naves at right angles to each other, in one of which the male and in the other the female members of the congregation worship separately. The manufactures include woollen cloth, nails, white lead, potash, and Prussian blue; and there is some trade in corn, cattle, and wood. Freudenstadt was founded in 1599 by Protestant refugees from Austria, and at first it received from Duke Frederick the name of Frederickstadt, which on account of the peaceful prosperity of the town was afterwards changed to Freudenstadt. The population in 1875 was 5325.

FREUDENTHAL, a town of Austrian Silesia, circle of Troppau, on the Black Water, 22 miles W. of Troppau. It has a large castle, a Piarist college, an orphan asylum, a head real-school, and an under real-school. Its principal industries are linen and woollen weaving, and the manufacture of leather, chemicals, and metal wares. The population in 1869 was 6243.

FREYA, in Teutonic mythology, one of the Vanen, or spirits of the breathing wind which have their abode in Vansheim, or middle air between the upper and under world. Freya, or Fregga, becomes the wife of Odur or Woden (Odin), and the mother of Jörd, the earth, thus answering to the Greek Demeter. In the myth of Thor, whose hammer is stolen by the giant Thoym, Freya lends her feather garment to Loki, and thus enables him to go in search of it. Thoym refuses to give it up, unless Freya will consent to be his wife; and as Freya will not go, Thor, on the advice of the Heimdall, descends to Jötunheim in the disguise of a bride, and Thoym, taking the god to be Freya, meets his doom at his hands at the moment of his fancied nuptials.

FREYCINET, LOUIS CLAUDE DESAULSES DE (1779–1842), French navigator, was born at Montélimart in Dauphiny, August 7, 1779. In 1793 he entered the French navy. After taking part in several engagements against the English, he joined in 1800, along with his brother Henri Louis (1777–1840), who afterwards rose to the rank of admiral, the expedition sent out under Captain Baudin in the "Naturaliste" and "Géographe" to explore the south and south-west coasts of Australia. Much of the ground already gone over by Flinders was revisited, and new names imposed by this expedition, which claimed credit for discoveries really made by the English navigator (see FLINDERS). In 1805 Louis returned to Paris, and was entrusted by Government with the work of preparing the maps and plans of the expedition. In 1817 he commanded the "Uranie," in which Arago and others went to Rio de Janeiro, to take a series of pendulum measurements. This was only part of a larger scheme for obtaining observations, not only in geography and ethnology, but in astronomy, terrestrial magnetism, and meteorology, and for the collection of specimens in natural history. For three years Freycinet cruised about, visiting Australia, the Marianne, Sandwich, and other Pacific islands, South America, and other places, returning to France, notwithstanding the loss of the "Uranie," with fine collections in all departments of natural history, and with voluminous notes and drawings which form an important contribution to a knowledge of the countries visited. The results of this voyage were published under Freycinet's supervision, with the title of *Voyage Autour du Monde*, etc., in 1725–44, in 8 quarto volumes, and several folio volumes of fine plates and maps. It has not, however, been completed. Freycinet was admitted into the Academy of Sciences in 1825, and was one of the founders of the Paris Geographical Society. He died August 18, 1842.

FREYTAG, GEORG WILHELM FRIEDRICH (1788–1861), Arabist, was born at Lüneburg on the 19th of September, 1788. After the usual preliminary training he entered the university of Göttingen as a student of philology and theology. From 1811 to 1813 he acted as repetent or theological tutor there, but in the latter year he accepted an appointment as sub-librarian, at Königsberg, unable, it is said, any longer to witness the subjection of Hanover to the French. In 1815 he became a chaplain in the Prussian army, and in that capacity visited Paris, where he had ample opportunities for the cultivation of his favorite Oriental studies. On the proclamation of peace he resigned his chaplaincy, but with the sanction and support of his Government continued his researches in Arabic, Persian, and Turkish at Paris, under De Sacy. In 1819 he was appointed to the professorship of Oriental languages in the recently established university of Bonn; and this post he continued to hold until his death, which took place on the 16th of November, 1861. Besides publishing a compendium of Hebrew grammar (*Kurzgefasste Grammatik der Hebräischen Sprache*, 1835), and a treatise on Arabic versification (*Darstellung der Arabischen Verskunst*, 1838), he edited two volumes of Arabic songs (*Hamasæ Carmina*, 1828–52) and three of Arabic proverbs (*Arabum Proverbia*, 1838–43). But his principal work was the laborious and praiseworthy *Lexicon Arabico-Latinum* (1830–37), which rapidly superseded the earlier lexicons, and which, though not to be compared with the magnificent torso of Lane, is likely to remain long in current use as embodying the best results of the labors of De Sacy and his school. An abridgment of the larger work was published in 1837.

FRIAR, from the Latin *frater* through the French *frère* (Ital. *frate* or *fra*, Span. *frayle* or *fray*), a secondary form of a word which is common to all the Aryan languages, is a name commonly applied in English to any lay member of any mendicant order. One who has received ordination is usually dignified with the appellation of father. The church of Rome at present recognizes a considerable number of mendicant orders; but at the time when the word first became current in England, there were practically only four, namely, those which alone had been sanctioned by Pope Gregory X. at the second council of Lyons in 1274. They were the Eremite or Austin Friars, the Carmelites or White Friars, the Dominicans or Black Friars (sometimes also called preaching friars), and the Franciscans, Minors, or Gray Friars. For some estimate of the influence of these begging friars on the intellectual and social life of England, see ENGLAND, vol. viii. pp. 284, 285. They were first brought into Scotland during the reign of Alexander II., but for many years afterwards were subject to the provincials in England. The "Trinity Friars" also had a monastery at Fail in Kyle (Ayrshire); and their provincial had at one time a seat, in virtue of his office, in the Scottish Parliament. Members of the same order, popularly known as "crouched friars" or cross-bearers (fratres cruciferi), began to appear in England also about the year 1244, and occasional reference is made to them in various ecclesiastical constitutions of that and of the following century; but they never attained to any great importance. See MONACHISM, CARMELITES, DOMINICANS, FRANCISCANS.

FRIBOURG. See FREIBURG.

FRICTION is the resistance which every material surface presents to the sliding of any other such surface upon it. This resistance is due to the roughness of the surfaces; the minute projections upon each enter more or less into the minute depressions on the other, and when motion occurs these roughnesses must either be worn off, or continually lifted out of the hollows into which they have fallen, or both, the resistance to motion being in either case quite perceptible and measurable. Friction is preferably spoken of as "resistance" rather than "force," for a reason exactly the same as that which induces us to treat stress rather as molecular resistance (to change of form) than as force, and which may be stated thus:—although friction can be utilized as a moving force at will, and is continually so used, yet it cannot be a primary moving force; it can transmit or modify motion already existing, but cannot in the first instance cause it. For this some external force, not friction, is required. The analogy with stress appears complete; the motion of the "driving link" of a machine is communicated to all the other parts, modified or unchanged as the case may be, by the stresses in those parts; but the actual setting in motion of the driving link itself cannot come about by stress, but must have for its production force obtained directly from the expenditure of some form of energy. It is important, however, that the use of the term "resistance" should not be allowed to mislead. Friction resists the motion of one surface upon another, but it may and frequently does confer the motion of the one upon the other, and in this way causes, instead of resists, the motion of the latter. This may be made more clear, perhaps, by an illustration. Suppose we have a leather strap A passing over a fixed cylindrical drum B, and let a pulling force or effort be applied to the strap. The force applied to A can act on B only at the surfaces of contact between them. There it becomes an effort tending either to move A upon B, or to move the body B itself, according to the frictional conditions. In the absence of friction it would simply cause A to slide on B, so that we may call it an effort tending to make A slide on B. The friction is the resistance offered by the surface of B to any such motion. But the value of this resistance is not in any way a function of the effort itself,—it depends chiefly upon the pressure normal to the surfaces and the nature of the surfaces. It may therefore be either less or greater than the effort. If less, A slides over B, the rate of motion being determined by the excess of the effort over the resistance (friction). But if the latter be greater, no sliding can occur, *i.e.*, A cannot, under the action of the supposed force, move upon B. The effort between the surfaces exists, however, exactly as before,—and it must now tend to cause the motion of B. But the body B is fixed,—or, in other words, we suppose its resistance to motion greater than any effort which can tend to move it,—hence no motion takes place. It must be specially noticed, however, that it is not the friction between A and B that has prevented motion, this only prevented A moving on B,—it is the force which keeps B stationary, whatever that may be, which has finally prevented any motion taking place. This can be easily seen. Suppose B not to be fixed, but to be capable of moving against some third body C (which might, *e.g.*, contain cylindrical bearings, if B were a drum with its shaft), itself fixed,—and further, suppose the frictional resistance between B and C to be the only resistance to B's motion. Then if this be less than the effort of A upon B, as it of course may be, this effort will cause the motion of B. Thus friction causes motion, for had there been no frictional resistance between the surfaces of A and of B, the latter body would have remained stationary, and A only would have moved. In the case supposed, therefore, the friction between A and B is a necessary condition of B receiving any motion from the external force applied to A.

Without entering here on the mathematical treatment of the subject of friction, some general conclusions may be pointed out which have been arrived at as the results of experiment. The "laws" first enunciated by Coulomb (1781), and afterwards confirmed by Morin (1830–34), have been found to hold good within very wide limits. These are—(1) that the friction is proportional to the normal pressure between the surfaces of contact, and therefore independent of the area of those surfaces (*i.e.*, of the intensity of the pressure), and (2) that it is independent of the velocity with which the surfaces slide one on the other. For many practical purposes these statements are sufficiently accurate, and they do in fact sensibly represent the results of experiment for the pressures and at the velocities most commonly occurring. Assuming the correctness of these, friction is generally measured in terms simply of the total pressure between the surfaces, by multiplying it by a "coefficient of friction" depending on the material of the surfaces and their state as to smoothness and lubrication. But beyond certain limits the "laws" stated are certainly incorrect, and are to be regarded as mere practical rules, of extensive application certainly, but without any pretension to be looked at as really general laws.

Coulomb pointed out long ago that the resistance of a body to be set in motion was in many cases much greater than the resistance which it offered to continued motion; and since his time writers have always distinguished the "friction of rest," or static friction, from the "friction of motion," or kinetic friction. He showed also that the value of the former depended often both upon the intensity of the pressure and upon the length of time during which contact had lasted, both which facts quite agree with what we should expect from our knowledge of the physical nature, already mentioned, of the causes of friction. It seems not unreasonable to expect that the influence of time upon friction should show itself in a comparison of very slow with very rapid motion, as well as in a comparison of starting (*i.e.*, motion after a long time of rest) with continued motion. That the friction at the higher velocities occurring in engineering practice is much less than at common velocities has been shown by several modern experiments, most recently by those of Captain Douglas Galton (Brit. Assoc., Dublin Meeting, 1878, and Inst. Mech. Eng., Paris and Manchester Meetings, 1878) on the friction between brake-blocks and wheels, and between wheels and rails. Until quite lately, however, no increase in the coefficient of friction had ever been detected at slow speeds, but the recent experiments of Prof. Fleeming Jenkin (*Phil. Trans.*, 1877, pt. 2) have shown conclusively that at extremely low velocities (the lowest measured was about ·0002 feet per second) there is a sensible increase of frictional resistance in many cases, most notably in those in which there is the most marked difference between the friction of rest and that of motion. These experiments distinctly point to the conclusion, although without absolutely proving it, that in such cases the coefficient of kinetic friction gradually increases as the velocity becomes extremely small, and passes without discontinuity into that of static friction. We know that both at very high and very low pressures the coefficient of friction is affected by the intensity of pressure, and that, just as with velocity, it can only be regarded as independent of the intensity and proportional simply to the total load within more or less definite limits. Recent experiments have not, however, been directed so much to this point as to the influence of velocity, which we have already mentioned. (A. B. W. K.)

FRIEDLAND, a town of Bohemia, the chief town of a circle, is situated in the valley of the Wittich at the confluence of that river with the Rasnitz, 14 miles E. of Zittau. Besides the old town, which is still surrounded by walls, it contains three suburbs. The principal industry is the manufacture of woollen and linen cloth. Friedland is chiefly remarkable for its old castle, which occupies an imposing situation on a small hill commanding the town. The tower of this building was erected in 1014, and the whole structure was completed in 1551. It was several times besieged in the Thirty Years' and Seven Years' Wars. In 1622 it was purchased by Wallenstein, and his likeness, painted in 1626, is included in the list of portraits of former possessors of the castle which adorn its walls. The population in 1875 was 4482.

FRIEDLAND, a town of Germany, in the grand-duchy of Mecklenburg-Strelitz, circle of Stargard, is situated on the Mühlenteich, 35 miles N.E. of Strelitz. It is surrounded by walls, and possesses a fine Gothic church and a gymnasium. It has manufactures of woollen and linen cloths, leather, and tobacco. Friedland was founded in 1244 by the margraves John and Otho III. of Brandenburg. The population in 1875 was 5086.

FRIEDLAND, a town of Prussia, in the government district of Königsberg, province of Prussia, is situated on the Alle, 27 miles S. E. of Königsberg. At Friedland Napoleon gained a victory over the Russians under Bennigsen (June 14) which led to the peace concluded at Tilsit July 7, 1807. The population in 1875 was 3299.

FRIEDLAND, VALENTINE. See TROTZENDORF.

FRIENDLY ISLANDS. The group thus named by Captain Cook, and otherwise called after the name of its chief island Tonga, was discovered by Tasman in 1643. It lies in the South Pacific, on the S. W. limits of the area occupied by the Polynesian race, about 350 miles S. S. W. from Samoa, and 250 E. S. E. from Fiji. The long chain of islands, numbering about 150, though with a collective area hardly exceeding 400 square miles, extends from 18° 5′ to 22° 29′ S. lat., and 173° 52′ to 176° 10′ W. long., and is broken into three groups, viz., the Tonga to the S., Habai (which again is divided into three clusters) in the centre, and Haafulahao or Vavau, to the N. Along the W. side of the N. half of this chain is a line of volcanic action, where the islands (of which three are active volcanoes) are high and wooded, one peak rising over 5000 feet. But the great majority of the islands are level, averaging 40 feet high, with hills rising to 600 feet; their sides are generally steep; they are formed of coral limestone, in some places a compact white rock, and in Vavau occasionally crystalline, and containing stalactitic caves of great beauty. The surface is covered, which is unusual in coral islands, with a deep rich mould, mixed towards the sea with sand, and having a substratum of red or blue clay. The soil is thus very productive, although water is scarce and bad. Running streams are very rare, but streams and basins of clear water occur in the limestone rock below the surface.

Reefs.—Barrier reefs are rare; fringing reefs are numerous, except on the E. side, which is nearly free, and there are many small isolated reefs and volcanic banks among the islands. If the reefs impede navigation they form some good harbors. The best is on the S. W. side of Vavau; another is on the N. of Tonga at Bangaimotu.

Islands.—The most considerable island is *Tonga*, or *Tonga-tabu* (the Sacred Tonga), in the S. group, about 21 by 12 miles, and 128 square miles in area, which contains the capital, Nukualofa. The vegetation is rich and beautiful, but the scenery tame, the land seldom rising above 60 feet. *Eoa*, 9 miles to the S. E. and nearly 12 by 5 miles, is 600 feet high, and much more picturesque, diversified by rocks and woods. *Vavau*, in the N. group, is next to Tonga in size, 42 miles in circumference and 300 feet high. Next to these come *Nomuka* and *Lefuka* in the Habai group, about 19 miles in circumference; *Tofua*, 2846 feet, *Late*, 1820 feet, and *Kao*, 5080 feet high, which are volcanic, and smaller. Vavau and the neighboring islands are higher and more varied in contour than those to the S. The islands of the central group are numerous and very fertile. Earthquakes are frequent; from 1845 to 1857 volcanic eruptions were very violent, and islands once fertile were devastated and nearly destroyed. A new island rose from the sea, and was at once named "Wesley," but disappeared again.

Climate.—The climate is enervating; it is damp, with heavy dews and frequent alternations of temperature, which averages 75°–77° F., though considerably higher in Vavau. Cool S. E. trade winds blow, sometimes with great violence, from April to December. During the rest of the year the winds blow from W. N. W. and N., with rain and occasional destructive hurricanes.

Flora.—The vegetation is similar to that of Fiji, but more definitely Indo-Malayan in character; it embraces all the plants of the groups to the E., with many that are absent there. Ferns abound, some of them peculiar, and tree ferns on the higher islands. There are 4 palms, among them the *Kentia* of Fiji. For the rest, Gramineæ, Rubiaceæ, Ficoideæ, Myrtaceæ, Euphorbiæ, Malvaceæ, and Leguminosæ predominate. All the usual fruit trees and cultivated plants of the Pacific are found. The most valuable timber trees are the tamanu (*Calophyllum Burmanni*), milo (*Thespesia populnea*), futu (*Barringtonia speciosa*), mohemohe, tavaki, and *Casuarina* or iron-wood.

Fauna.—The only indigenous land mammalia are a small rat and a few curious species of bats. The dog and the pig were no doubt introduced by man. Sheep and cattle imported of late years by Europeans do not multiply, owing to insufficient space and pasture. Of birds some 30 kinds are known, an owl being the only bird of prey; parrots, pigeons, kingfishers, honey-suckers, rails, ducks, and other water birds are numerous. There are snakes and small lizards, but no frogs or toads. Of insects there are relatively few kinds; but ants, beetles, and mosquitoes abound. The fishes, of an Indo-Malay type, are varied and numerous. Turtle and sea-snakes abound, as do mollusca, of which a few are peculiar, and zoophytes.

People.—The inhabitants are, intellectually, perhaps the most advanced of the Polynesian race, and exercise an influence over distant neighbors, especially in Fiji, quite out of proportion to their numbers, which do not exceed 20,000 or 25,000. Their conquests have extended as far as Niue, or Savage Island, 200 miles to the E., and to various other islands to the N. In Cook's time Poulaho, the principal chief, considered Samoa to be within his dominions. This pre-eminence may perhaps be due to an early infusion of Fijian blood: Pritchard (*Polynesian Reminiscences*) observed such crosses to be always more vigorous than the pure races in these islands; and this influence seems also traceable in the Tongan dialect, and appears to have been partially transmitted thence to the Samoan. Various customs, traditions, and names of places point to a former relation with Fiji, but Fijian influence in Tonga is insignificant compared with that of Tonga in Fiji (see FIJI). Their prior conversion to Christianity gave the people material as well as moral advantages over their neighbors, and King George, a very remarkable man, and far in advance of his people, has, during a long reign, made the most of these.

Until recently there were, as in Japan, two sovereigns; the higher of these, called Tui Tonga (Chief of Tonga), was greatly reverenced, but for at least the last 200 years has enjoyed little power. The real ruler, and the chief officers of the state, were members of the Toubo family, from which also the wife of the Tui Tonga was always chosen, whose descendants through the female line had, under the title of "tamaha," special honors and privileges, recalling the "vasu" of Fiji.[1] Below these came the Eiki or chiefs, and next to them the class called Matabulé. These were the hereditary counsellors and companions of the chiefs, and conveyed to the people the decisions formed at their assemblies. They also directed the national ceremonies, and preserved the popular traditions. During the long civil wars in the early part of this century, the institution of Tui Tonga lapsed, and various chiefs became independent, but they were gradually subdued, and the whole group united by King George. He commuted for a money payment the service due from the common people to their chiefs, whom he assembles in a sort of Parliament, having in 1862 established a "constitutional government." Taxation is heavy: a poll tax of 4 dollars is levied and strictly enforced.

The limited extent and resources of the islands tends to minimize foreign settlement and interference, but missionary influence is, directly or indirectly, supreme. The régime is accordingly somewhat strained and severe, and restless spirits have to seek a vent for their energies in Fiji or elsewhere. Crime, however, is infrequent, and morality, always above the Polynesian average, is improving; nearly every one can read, and there is a general appearance of order and comfort. The people have strict notions of etiquette and gradations of rank; their natural independence and self-esteem is perhaps fostered by their frequent employment as the teachers of others, for which, however, they show much aptitude; otherwise they are amiable and (especially in the upper ranks) courteous. They are arrogant, lively, inquisitive, and inclined to steal,—their attacks, in earlier days, on Europeans, when not caused by misunderstandings, being due probably to their desire to obtain property which to them was of immense value. They are brave and not devoid of energy, though the soft climate and the abundance of food are against sustained exertion or great industrial progress. They value children, and seldom practise infanticide, and cannibalism only in exceptional cases. Their women are kindly treated, and only do the lighter work. Agriculture, which is well understood, is the chief industry. They are bold and skilful sailors and fishermen; other trades, as boat and house building, carving, cooking, net and mat making, are usually hereditary. Their houses are slightly built, but the surrounding ground and roads are laid out with great care and taste.

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[1] A similar institution ("tamasa") exists at Samoa.

There are some ancient stone remains here, as in the Caroline Islands, burial places (feitoka) built with great blocks, and a remarkable monument consisting of two large blocks with a transverse one, containing a circular basin in the centre.

The principal diseases are leprosy and elephantiasis, tona (the thoko of Fiji), influenza, ulcers, scrofula, consumption, and ophthalmia. Owing to the absence of swamps, fever of a severe type is rare.

The chief articles of export are cocoa-nut oil and copra; a little sugar, cotton, and coffee, the cultivation of which is encouraged by the king; and fresh provisions for ships, as yams, pigs, and poultry. The chief imports are cloth, cotton prints, hardware, mirrors, etc., but these are not on the increase. Whale fishing (once extensive) is still carried on among the islands by European and American vessels.

See *Cook's Voyages*; Mariner's *Account of the Natives of the Tonga Islands*; Dumont d'Urville's *Voyage de l' "Astrolabe;"* West's *Ten Years in South Central Polynesia*; Brenchley's *Jottings during Cruise of H.M.S. "Curaçoa,"* 1865; Meinicke, *Die Inseln des Stillen Oceans*; Waldegrave in *R. G. S. Journal*, 1850. (C. T.)

Definition.

FRIENDLY SOCIETIES, according to the comprehensive definition of the Friendly Societies Act, 1875, which now regulates such societies in Great Britain and Ireland, are "societies established to provide by voluntary subscriptions of the members thereof, with or without the aid of donations, for the relief or maintenance of the members, their husbands, wives, children, fathers, mothers, brothers or sisters, nephews or nieces, or wards being orphans, during sickness or other infirmity, whether bodily or mental, in old age, or in widowhood, or for the relief or maintenance of the orphan children of members during minority; for insuring money to be paid on the birth of a member's child, or on the death of a member, or for the funeral expenses of the husband, wife, or child of a member, or of the widow of a deceased member, or, as respects persons of the Jewish persuasion, for the payment of a sum of money during the period of confined mourning; for the relief or maintenance of the members when on travel in search of employment, or when in distressed circumstances, or in case of shipwreck, or loss or damage of or to boats or nets; for the endowment of members or nominees of members at any age; for the insurance against fire to any amount not exceeding £15 of the tools or implements of the trade or calling of the members"—and are limited in their contracts for assurance of annuities to £50, and for assurance of a gross sum to £200. They may be described in a more popular and condensed form of words as the mutual assurance societies of the poorer classes, by which they seek to aid each other in the emergencies arising from sickness and death and other causes of distress. A phrase in the first Act for the encouragement and relief of friendly societies, passed in 1793, designating them "societies of good fellowship," indicates another useful phase of their operations.

Origin.

The origin of the friendly society is, probably in all countries, the burial club. It has been the policy of every religion, if indeed it is not a common instinct of humanity, to surround the disposal of a dead body with circumstances of pomp and expenditure, often beyond the means of the surviving relatives. The appeal for help to friends and neighbors which necessarily follows is soon organized into a system of mutual aid, that falls in naturally with the religious ceremonies by which honor is done to the dead. Thus Archdeacon Gray tells us that in China there are burial societies, termed "long-life loan companies," in almost all the towns and villages. Among the Greeks the ἔρανοι combined the religious with the provident element. From the Greeks the Romans derived their fraternities of a similar kind. The Teutons in like manner had their guilds. Whether the English friendly society owes it origin in the higher degree to the Roman or the Teutonic influence can hardly be determined. The utility of providing by combination for the ritual expenditure upon burial having been ascertained, the next step—to render mutual assistance in circumstances of distress generally—was any easy one, and we find it taken by the Greek ἔρανοι and by our own guilds. Another modification—that the societies should consist not so much of neighbors as of persons having the same occupation—soon arises; and this is the germ of our trade unions and our city companies in their original constitution. The interest, however, that these inquiries possess is mainly antiquarian. The legal definition of a friendly society quoted above points to an organization more complex than those of the ancient fraternities and guilds, and proceeding upon different principles. It may be that the one has grown out of the other. The common element of a provision for a contingent event by a joint contribution is in both; but the friendly society alone has attempted to define with precision what is the risk against which it intends to provide, and what should be the contributions of the members to meet that risk.

It would be curious to endeavor to trace how, after the suppression of the religious guilds in the 16th century, and the substitution of an organized system of relief by the poor law of Elizabeth for the more voluntary and casual means of relief that previously existed, the present system of friendly societies grew up. The modern friendly society, particularly in rural districts, clings with fondness to its annual feast and procession to church, its procession of all the brethren on the occasion of the funeral of one of them, and other incidents which are almost obviously survivals of the customs of mediæval guilds. The last recorded guild was in existence in 1628, and there are records of friendly societies as early as 1634 and 1639. The connecting links, however, cannot be traced. With the exception of a society in the port of Borrowstounness on the Firth of Forth, no existing friendly society is known to be able to trace back its history beyond a date late in the 17th century, and no records remain of any that might have existed in the latter half of the 16th century or the greater part of the 17th. One founded in 1666, was extant in 1850, but it has since ceased to exist. This is not so surprising as it might appear. Documents which exist in manuscript only are much less likely to have been preserved since the invention of printing than they were before; and such would be the simple rules and records of any society that might have existed during this interval—if, indeed, many of them kept records at all. How usual is it for a voluntary society of any kind to die away with the generation of men among whom it was founded! On the whole, it seems probable therefore that the friendly society is a lineal descendant of the ancient guild—the idea never having wholly died out, but having been kept up from generation to generation in a succession of small and scattered societies.

Spitalfields refugees.

At the same time, it seems probable that the friendly society of the present day owes its revival to a great extent to the Protestant refugees of Spitalfields, one of whose societies was founded in 1703, and has continued for 176 years among descendants of the same families, whose names proclaim their Norman origin. This society has distinguished itself by the intelligence with which it has adapted its machinery to the successive modifications of the law, and has very recently completely reconstructed its rules under the provisions of the Friendly Societies Acts, 1875 and 1876.

Another is the society of Lintot, founded in London in 1708, in which the office of secretary has for more than half a century been filled by persons of the name of Levesque, one of whom has published a translation of its original rules. No one was to be received into the society who was not a member, or the descendant of a member, of the church of Lintot, of recognized probity, a good Protestant, and well-intentioned towards the queen [Anne] and faithful to the Government of the country. No one was to be admitted below the age of eighteen, or who had not been received at holy communion, and become member of a church. A member should not have a claim to relief during his first year's membership, but if he fell sick within the year, a collection should be made for him among the members. This society has only 50 members, but its funds exceed £2000. The foreign names still borne by a large proportion of the members show that the connection with descendants of the refugees is maintained.

Act of 1793.

The example of providence given by these societies was so largely followed that Sir George Rose's Act in 1793 recognized the existence of numerous societies, and provided encouragement for them in various ways, as well as relief from taxation to an extent which in those days must have been of great pecuniary value, and exemption from removal under the poor law. The benefits offered by this statute were readily accepted by the societies, and the vast number of societies which speedily became enrolled shows that Sir George Rose's Act met a real public want. In the county of Middlesex alone nearly a thousand societies were enrolled within a very few years after the passing of the Act, and the number in some other counties was almost as great. The societies then formed were nearly all of a like kind,—small clubs, in which the feature of good fellowship was in the ascendant, and that of provident assurance for sickness and death merely accessory. This is indicated by one provision which occurs in many of the early enrolled rules, viz., that the number of members shall be limited to 61, 81, or 101, as the case may be. The odd 1 which occurs in these numbers probably stands for the president or secretary, or is a contrivance to ensure a clear majority. Several of these old societies are still in existence, and can point to a prosperous career extending over (in some cases) more than 100 years—a prosperity based rather upon good luck than upon scientific calculation. Founded among small tradesmen or persons in the way to thrive, the claims for sickness were only made in cases where the sickness was accompanied by distress, and even the funeral allowance was not always demanded.

Act of 1819.

The societies generally not being established upon any scientific principle, those which met with this prosperity were the exception to the rule; and accordingly the cry that friendly societies were failing in all quarters was as great in 1819 as in 1869. A writer of that time speaks of the instability of friendly societies as "universal;" and the general conviction that this was so resulted in the passing of the Act of 1819, 59 Geo. III. c. 128. It recites that "the habitual reliance of poor persons upon parochial relief, rather than upon their own industry, tends to the moral deterioration of the people and to the accumulation of heavy burdens upon parishes; and it is desirable, with a view as well to the reduction of the assessment made for the relief of the poor as to the improvement of the habits of the people, that encouragement should be afforded to persons desirous of making provision for themselves or their families out of the fruits of their own industry. By the contributions of the savings of many persons to one common fund the most effectual provision may be made for the casualties affecting all the contributors; and it is therefore desirable to afford further facilities and additional security to persons who may be willing to unite in appropriating small sums from time to time to a common fund for the purposes aforesaid, and it is desirable to protect such persons from the effects of fraud or miscalculation." This preamble went on to recite that the provisions of preceding Acts had been found insufficient for these purposes, and great abuses had prevailed in many societies established under their authority. By this statute a friendly society was defined as "an institution, whereby it is intended to provide, by contribution, on the principle of mutual insurance, for the maintenance or assistance of the contributors thereto, their wives or children, in sickness, infancy, advanced age, widowhood, or any other natural state or contingency, whereof the occurrence is susceptible of calculation by way of average." It will be seen that this Act dealt exclusively with the scientific aspect of the societies, and had nothing to say to the element of good fellowship. Rules and tables were to be submitted by the persons intending to form a society to the justices, who, before confirming them, were to satisfy themselves that the contingencies which the society was to provide against were within the meaning of the Act, and that the formation of the society would be useful and beneficial, regard being had to the existence of other societies in the same district. No tables or rules connected with calculation were to be confirmed by the justices until they had been approved by two persons at least, known to be professional actuaries or persons skilled in calculation, as fit and proper, according to the most correct calculation of which the nature of the case would admit. The justices in quarter sessions were also by this Act authorized to publish general rules for the formation and government of friendly societies within their county. The practical effect of this statute in requiring that the societies formed under it should be established on sound principles does not appear to have been as great as might have been expected. The justices frequently accepted as "persons skilled in calculation" local schoolmasters and others who had no real knowledge of the technical difficulties of the subject, while the restrictions upon registry served only to increase the number of societies established without becoming registered. In 1829, the law relating to friendly societies was entirely reconstructed by the 10 Geo. IV. c. 56, and a barrister was appointed under that Act to examine the rules of societies, and ascertain that they were in conformity to law and to the provisions of the Act. The barrister so appointed was Mr. John Tidd Pratt; and no account of friendly societies would be complete that did not do justice to the remarkable public service rendered by this gentleman. For forty years, though he had by statute really very slight authority over the societies, his name exercised the widest influence, and the numerous reports and publications by which he endeavored to impress upon the public mind sound principles of management of friendly societies, and to expose those which were managed upon unsound principles, made him a terror to evil-doers. On the other hand, he lent with readiness the aid of his legal knowledge and great mental activity to assisting well-intentioned societies in coming within the provisions of the Acts, and thus gave many excellent schemes a legal organization.

Act of 1829.

Acts of 1834 and 1846.

By the Act of 1829, in lieu of the discretion as to whether the formation of the proposed society would be useful and beneficial, and the requirement of the actuarial certificate to the tables, it was enacted that the justices were to satisfy themselves that the tables proposed to be used might be adopted with safety to all parties concerned. This provision, of course, became a dead letter, and was repealed in 1834 by 4 and 5 Wm. IV. c. 40. Thenceforth, societies were free to establish themselves upon what conditions and with what rates they chose, provided only they satisfied the barrister that the rules were "calculated to carry into effect the intention of the parties framing them," and were "in conformity to law." In 1846, by 9 and 10 Vic. c. 27, the barrister certifying the rules was constituted "Registrar of Friendly Societies," and the rules of all societies were brought together under his custody. An actuarial certificate was to be obtained before any society could be registered "for the purpose of securing any benefit dependent on the laws of sickness and mortality." In 1850 the Acts were again repealed and consolidated with amendments (13 and 14 Vic. c. 115). Societies were divided into two classes, "certified" and "registered." The certified societies were such as obtained a certificate to their tables by an actuary possessing a given qualification, who was required to set forth the data of sickness and mortality upon which he proceeded, and the rate of interest assumed in the calculations. All other societies were to be simply registered. Very few societies were constituted of the "certified" class. The distinction of classes was repealed and the Acts were again consolidated in 1855 by 18 and 19 Vic. c. 63. Under this Act, which admitted of all possible latitude to the framers of rules of societies, 21,875 societies were registered, a large number of them being lodges or courts of affiliated orders, and the Act continued in force till the end of 1875.

Act of 1850.

Act of 1855.

Act of 1875.

The law which now regulates friendly societies in Great Britain was passed in 1875 (38 and 39 Vic. c. 60), and amended in 1876 (39 and 40 Vic. c. 32). It still bears the permissive and elastic character which marked the more successful of the previous Acts, but it provides ampler means to members of ascertaining and remedying defects of management and of restraining fraud. The business of registry is under the control of a chief registrar, who has an assistant registrar in each of the three countries, with an actuary. It is his duty, among other things, to require from every society a return in proper form each year of its receipts and expenditure, funds, and effects; a return once every five years of the sickness and mortality it has experienced; and also once every five years a valuation of its assets and liabilities. Upon the application of a certain proportion of the members, varying according to the magnitude of the society, the chief registrar may appoint an inspector to examine into its affairs, or may call a general meeting of the members to consider and determine any matter affecting its interests. These are powers which have been used with excellent effect. Cases have occurred in which fraud has been detected and punished by this means that could not probably have been otherwise brought to light. In others a system of mismanagement has been exposed and effectually checked. The power of calling special meetings has enabled societies to remedy defects in their rules, to remove officers guilty of misconduct, etc., where the procedure prescribed by the rules was for some reason or other inapplicable. Upon an application of a like proportion of members the chief registrar may, if he finds that the funds of a society are insufficient to meet the existing claims thereon, or that the rates of contribution are insufficient to cover the benefits assured (upon which he consults his actuary), order the society to be dissolved, and direct how its funds are to be applied.

Royal Commission.

This legislation was the result of the labors of a Royal Commission of high authority, presided over by Sir Stafford Northcote, which sat from 1870 to 1874, and prosecuted an exhaustive inquiry into the organization and condition of the various classes of friendly societies. Their reports occupy more than a dozen large bluebooks. They divide registered friendly societies into 13 classes.

Classes of societies.

The first class includes the affiliated societies or "orders," such as the Manchester Unity of Odd Fellows, the Ancient Order of Foresters, the Rechabites, Druids, etc. These societies have a central body, either situated in some large town, as in the case of the Manchester Unity, or moving from place to place, as in that of the Foresters. Under this central body, the country is (in most cases) parcelled out into districts, and these districts again consist each of a number of independent branches, called "lodges," "courts," "tents," or "divisions," having a separate fund administered by themselves, but contributing also to a fund under the control of the central body. The Manchester Unity has (1878) 456 districts, 4121 lodges, 526,802 members, and £4,325,000 funds; the Order of Foresters 287 districts, 4414 courts, 521,416 members, £2,497,000 funds. It may give an idea of the great utility of these societies to mention that the various courts of Foresters paid their members 3,197,366 days' sick pay in a single year, and paid burial money on 4666 deaths. Besides these two great orders, there are about forty smaller affiliated bodies, each having more than 1000 members; and the affiliated form of society appears to have great attraction. Indeed, in the colony of Victoria, Australia, all the existing friendly societies are of this class. The orders have their "secrets," but these, it may safely be said, are of a very innocent character, and merely serve the purpose of identifying a member of a distant branch by his knowledge of the "grip," and of the current password, etc. Indeed they are now so far from being "secret societies" that their meetings are attended by reporters and the debates published in the newspapers, and the Order of Foresters has recently passed a wise resolution expunging from its publications all affectation of mystery.

The second class is made up of "general societies," principally existing in London, of which the Commissioners enumerated 8 with nearly 60,000 members, and funds amounting to a quarter of a million; these societies are managed at a cost, on the average, of about 10 per cent. of their income.

The third class includes the "county societies," of which there were 11, 10 of which had £221,955 funds and 29,036 members, and 30 others approaching that type. These societies have been but feebly supported by those for whose benefit they are instituted, having all exacted high rates of contribution, in order to secure financial soundness.

Class 4, "local town societies," is a very numerous one. Among some of the larger societies may be mentioned the "Chelmsford Provident," with £26,403 funds, and 2352 members; the "Brighton and Sussex Mutual," with £35,752 funds, and 824 members; the "Cannon Street, Birmingham," with £66,780 funds, and 8347 members; the "Birmingham General Provident," £37,997 funds, and 3379 members. In this group might also be included the interesting societies which are established among the Jewish community. They differ from ordinary friendly societies partly in the nature of the benefits granted upon death, which are intended to compensate for loss of employment during the time of ceremonial seclusion enjoined by the Jewish law, which is called "sitting shiva." They also provide a cab for the mourners and rabbi, and a tombstone for the departed, and the same benefits as an ordinary friendly society during sickness. Some also provide a place of worship. Of these the "Pursuers of Peace" (enrolled in December, 1797), the "Bikhur Cholim, or Visitors of the Sick" (April, 1798), the "Hozier Holim" (1804), and nearly 50 others, of which 4 are courts of the Order of Foresters, are on the register for Middlesex. Mr. Adler calculates that some 30 or 40 such societies are in existence in London. Two or three societies have been certified (under the earlier Acts) for accumulating by weekly subscriptions a fund for the purchase of flour and the baking of passover cakes.

Class 5 is "local village and country societies," including the small public house clubs which abound in the villages and rural districts, a large proportion of which are unregistered.

Class 6 is formed of "particular trade societies."

Class 7 is "dividing societies." These were before 1875 unauthorized by law, though they were very attractive to the members. Their practice is usually to start afresh every January, paying a subscription somewhat in excess of that usually charged by an ordinary friendly society, out of which a sick allowance is granted to any member who may fall sick during the year, and at Christmas the balance not so applied is divided among the members equally, with the exception of a small sum left to begin the new year with. The mischief of the system is that, as there is no accumulation of funds, the society cannot provide for prolonged sickness or old age, and must either break up altogether or exclude its sick and aged members at the very time when they most need its help. This, however, has not impaired the popularity of the societies, and the Act of 1875, framed on the sound principle that the protection of the law should not be withheld from any form of association, enables a society to be registered with a rule for dividing its funds, provided only that all existing claims upon the society are to be met before a division takes place.

Class 8, "deposit friendly societies," combine the characteristics of a savings bank with those of a friendly society. They were devised by the late Hon. and Rev. S. Best, on the principle that a certain proportion of the sick allowance is to be raised out of a member's separate deposit account, which, if not so used, is retained for his benefit. Their advantages are in the encouragement they offer to saving, and in meeting the selfish objection sometimes raised to friendly societies, that the man who is not sick gets nothing for his money; their disadvantage is in their failing to meet cases of sickness so prolonged as to exhaust the whole of the member's own deposit.

Class 9, "collecting societies," are so called because their contributions are received through a machinery of house-to-house collection. These were the subject of much laborious investigation and close attention on the part of the Commissioners. They deal with a lower class of the community, both with respect to means and to intelligence, than that from which the members of ordinary friendly societies are drawn. The large emoluments gained by the officers and collectors, the high percentage of expenditure (often exceeding half the contributions), and the excessive frequency of lapsing of insurances point to mischiefs in their management. "The radical evil of the whole system (the Commissioners remark) appears to us to lie in the employment of collectors, otherwise than under the direct supervision and control of the members, a supervision and control which we fear to be absolutely unattainable in burial societies that are not purely local." On the other hand, it must be conceded that these societies extend the benefits of life insurance to a class which the other societies cannot reach, namely, the class that will not take the trouble to attend at an office, but must be induced to effect an insurance by a house-to-house canvasser, and be regularly visited by the collector to ensure their paying the contributions. To many such persons these societies, despite all their errors of constitution and management, have been of great benefit. The great source of these errors lies in a tendency on the part of the managers of the societies to forget that they are simply trustees, and to look upon the concern as their own personal property to be managed for their own benefit. These societies are of two kinds, local and general. The Commissioners enumerated 239 local societies, with over 680,000 members, and £203,777 funds; and 20 of the more important general societies, with members estimated at 1,426,023, and funds at £461,605. For the general societies the Act of 1875 makes certain stringent provisions. Each member is to be furnished with a copy of the rules for one penny, and a signed policy for the same charge. Forfeiture of benefit for non-payment is not to be enforced without fourteen days' written notice. The transfer of a member from one society to another is not to be made without his written consent and notice to the society affected. No collector is to be a manager, or vote or take part at any meeting. At least one general meeting shall be held every year, of which notice is to be given either by advertisement or by letter or post card to each member. The balance sheet is to be open for inspection seven days before the meeting, and is to be certified by a public accountant, not an officer of the society. Disputes may be settled by justices, or county courts, notwithstanding anything in the rules of the society to the contrary. These provisions have certainly been found already very beneficial; but much more would be done for the benefit of the classes interested if the regulation which prevents the post office assuring less than £20 were abrogated, and if a general system of collection through the post office were established.

Closely associated with the question of the management of these societies is that of the risk incurred by infant life, through the facilities offered by these societies for making insurances on the death of children. That this is a real risk is certain from the records of the assizes, and from many circumstances of suspicion; but the extent of it cannot be measured, and has probably been exaggerated. It has never been lawful to assure more than £6 on the death of a child under five years of age, or more than £10 on the death of one under ten. Previous to the Act of 1875, however, there was no machinery for ascertaining that the law was complied with, or for enforcing it. This is supplied by that Act, though still somewhat imperfectly. When the bill went up to the House of Lords, an amendment was made, reducing the limit of assurance on a child under three years of age to £3, but this amendment was unfortunately disagreed with by the House of Commons.

Class 10, annuity societies, prevail in the west of England. Six of these societies had, at the date of the last published returns, 719 members, and £79,136 funds. These societies are few, and their business is diminishing. Most of them originated at the time when Government subsidized friendly societies by allowing them £4, 11s. 3d. per cent. per annum interest. Now annuities may be purchased direct from the National Debt Commissioners. These societies are more numerous, however, in Ireland.

Class 11, female societies, are numerous. Many of them resemble affiliated orders at least in name, calling themselves Female Foresters, Odd Sisters, Loyal Orangewomen, Comforting Sisters, and so forth. In their rules may be found such a provision as that a member shall be fined who does not "behave as becometh an Orangewoman." Many are unregistered. In the northern counties of England they are sometimes termed "life boxes," doubtless from the old custom of placing the contributions in a box. The trustees, treasurer, and committee are usually females, but very frequently the secretary is a man, paid a small salary.

Under Class 12 the Commissioners included the societies for various purposes which were authorized by the secretary of state to be registered under the Friendly Societies Act of 1855, comprising working men's clubs, and certain specially authorized societies, as well as others that are now defined to be friendly societies. Among these purposes are assisting members in search of employment; assisting members during slack seasons of trade; granting temporary relief to members in distressed circumstances; purchase of coals and other necessaries to be supplied to members; relief or maintenance in case of lameness, blindness, insanity, paralysis, or bodily hurt through accidents; also, the assurance against loss by disease or death of cattle employed in trade or agriculture; relief in case of shipwreck or loss or damage to boats or nets; and societies for social intercourse, mutual helpfulness, mental and moral improvement, rational recreation, etc., called working men's clubs.

Class 13 is cattle insurance societies.

These are the thirteen classes into which the Commissioners divided registered friendly societies. There were 26,034 societies enrolled or certified under the various Acts for friendly societies in force between 1793 and 1855; and, as we have seen, 21,875 societies registered under the Act of 1855 before the 1st January, 1876, when the Act of 1875 came into operation. The total therefore of societies to which a legal constitution had been given was 47,909. Of these 26,087 were presumed to be in existence when the registrar called for his annual return, but only 11,282 furnished the return required. These had 3,404,187 members, and £9,336,946 funds. Twenty-two societies returned over 10,000 members each; nine over 30,000. One society (the Royal Liver Friendly Society, Liverpool, the largest of the collecting societies) returned 682,371 members. The next in order was one of the same class, the United Assurance Society, Liverpool, with 159,957 members; but in all societies of this class, the membership consists very largely of infants. The average of members in the 11,260 societies with less than 10,000 members each is only 171, showing how small in reality the bulk of Friendly Societies are. There are 58 societies with more than £10,000 funds; 18 with more than £30,000. In these again the Royal Liver heads the list with its £453,418; the next in succession being the Hearts of Oak, a society belonging to the Commissioners' second class, which has £179,995.

Unregistered societies.

Such are the registered societies; but there remains behind a large body of unregistered societies, estimated by the Commissioners to be in England nearly co-extensive with, in Scotland far to surpass in magnitude, the registered bodies. It is to be hoped that, as knowledge is spread of the advantages of registration,[1] and as the true principles upon which friendly societies should be established become better understood, the number of unregistered societies, in comparison with those registered, will become much less. It must be admitted, however, that at present progress is not being made in that direction. The classes among whom friendly societies are formed are greatly averse to any undertaking involving mental labor, and the idea of periodical returns and of the other requirements of the statute is more alarming to them than it need be. It will be the province of those charged with the administration of the statute to endeavor, as far as possible, to combat this tendency, and by wise use of the materials in their hands to seek to show the societies that the registry office is a ready and useful auxiliary to them, and that the trouble it gives them is more than met by compensating advantages.

The description we have given of the various classes of friendly societies, the number of their members, and the amount of their funds leads to the most hopeful conclusions as to their future. Though great loss has been occasioned by the failure of societies and by errors in their constitution and management, the provident habits of the people have survived all discouragement, and a fund has been accumulated which may be loosely estimated at nearly 15 millions sterling, contributed out of the savings of the flower of the working class. On every side there is displayed a desire by the societies to increase the soundness of their position, and to reform anything that may be wrong in their constitution.

Societies in Victoria.

The colonies, also, are following the same course. In that of Victoria, Australia, the report of the Government statist, Mr. H. H. Hayter, shows that on the 31st December, 1876, there were 761 branches, belonging to 34 societies, having 45,957 members, and assuring also sums at the death of 27,919 wives of members. The amount of contribution made by each member is, under ordinary circumstances, 1s. weekly. The benefits consist of sick pay, medical attendance, and funeral allowances. The sickness experienced during the year was 52,817 weeks, or nearly 7 working days per member, the number of members sick having been 8873. The usual sick pay is £1 per week for the first six months, reduced to 10s. or sometimes 13s. 4d. for the next six months, and to 5s. or sometimes 10s. for the remainder of sickness. The deaths were 452, or very nearly 10 in 1000. The amount paid on death of a member is usually £20, and of a member's wife £10. It will be seen that the benefits are greater in amount than is usual in societies in the mother country. The total income of the societies was £163,593, and their funds amounted to £351,284. The number of societies, members, and amount of income have about doubled during 10 years, the amount of funds having accumulated even more rapidly. It may be added that the report in question gives a more complete body of statistics relating to friendly societies than has ever been attempted to be collected elsewhere.

Foreign Countries.

In foreign countries the development of friendly societies has been slow. Belgium has a commission royale permanente des sociétés de secours mutuel, originally presided over by M. Visschers, and since by M. T'Kint de Roodenbeke. In France, under the second empire, a scheme was prepared for assisting friendly societies by granting them collective assurances under Government security. The societies have the privilege of investing their funds in the Caisse des Dépôts et Consignations, corresponding to the English National Debt Commission. In Germany a law was passed on the 7th April, 1876, on registered friendly societies. It prescribes for societies many things which in England are left to the discretion of their founders; and it provides for an amount of official interference in their management that is wholly unknown here. The superintending authority has a right to inspect the books of every society, whether registered or not, and to give formal notice to a society to call in arrears, exclude defaulters, pay benefits, or revoke illegal resolutions. A higher authority may, in certain cases, order societies to be dissolved. These provisions relate to voluntary societies; but it is competent for communal authorities also to order the formation of a friendly society, and to make a regulation compelling all workmen not already members of a society to join it.

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[1] These may be briefly summed up thus:—(1) power to hold land and vesting of property in trustees by mere appointment; (2) remedy against misapplication of funds; (3) priority in bankruptcy or on death of officer; (4) transfer of stock by direction of chief registrar; (5) exemption from stamp duties; (6) membership of minors; (7) certificates of birth and death at reduced cost; (8) investment with National Debt Commissioners; (9) reduction of fines on admission to copyholds; (10) discharge of mortgages by mere receipt; (11) obligation on officers to render accounts; (12) settlement of disputes; (13) insurance of funeral expenses for wives and children without insurable interest; (14) nomination at death; (15) payment without administration; (16) services of public auditors and valuers; (17) registry of documents, of which copies may be put in evidence.

Actuarial remarks. On the actuarial view of the management of friendly societies the following remarks have been supplied by Mr. William Sutton, actuary of the Friendly Societies' Registry. It is in the highest degree essential to the interests of their members that friendly societies should be financially sound,—in other words, that they should throughout their existence be able to meet the engagements into which they have entered with their members. For this purpose it is necessary that the members' contributions should be so fixed as to prove adequate, with proper management, to provide the benefits promised to the members. These benefits almost entirely depend upon the contingencies of health and life; that is, they take the form of payments to members when sick, of payments to members upon attaining given ages, or of payments upon members' deaths, and frequently a member is assured for all these benefits, viz., a weekly payment if at any time sick before attaining a certain age, a weekly payment for the remainder of life after attaining that age, and a sum to be paid upon his death. Of course the object of the allowance in sickness is to provide a substitute for the weekly wage lost in consequence of being unable to work, and the object of the weekly payment after attaining a certain age, when the member will probably be too infirm to be able to earn a living by the exercise of his calling or occupation, is to provide him with the necessaries of life, and so enable him to be independent of poor relief. There is every reason to believe that, when a large group of persons of the same age and calling are observed, there will be found to prevail among them, taken one with another, an average number of days' sickness, as well as an average rate of mortality, in passing through each year of life, which can be very nearly predicted from the results furnished by statistics based upon observations previously made upon similarly circumstanced groups. Assuming, therefore, the necessary statistics to be attainable, the computation of suitable rates of contribution to be paid by the members of a society in return for certain allowances during sickness, or upon attaining a certain age, or upon death, can be readily made by an actuarial expert. To furnish these statistics the Friendly Societies Acts have since 1829 required registered societies to make, every five years, a return in prescribed form of their sickness and mortality experience for the previous five years; and other materials of the same nature have from time to time been collected and published.

An important provision in the Friendly Societies Act, 1875, is that which requires every registered society to make a return of its receipts and expenditure, funds and effects, in a prescribed form, to the registrar of friendly societies every year. Particulars of the returns received will be found in the chief registrar's reports.

A still more important provision in the same Act is one which requires societies to have a valuation made once at least every five years of their assets and liabilities, including the estimated risks and contributions, and to furnish particulars thereof to the registrar in a prescribed form. The object of such valuation is to ascertain as far as can be estimated the financial position of a society,—in other words, whether the future contributions receivable, plus the money or funds in hand, will according to the best estimate that can be formed, prove sufficient to enable the society to meet its engagements hereafter; and the valuation balance sheet, therefore, takes the following form:

Valuation Balance Sheet of Friendly Society, as at (say) 31st December, 1878.

Dr.	£	*Cr.*	£
To estimated present value of future benefits to existing members,	"	By estimated present value of future contributions of existing members, . . .	"
		" funds invested and in hand, . .	"
Balance (being surplus)	"	By balance (being deficiency), . . .	"
	"		"

It is confidently expected that this provision will, after it has been in operation some time, prove of enormous value, as it will in many cases have the effect of warning the members of societies, before it is too late, that certain steps are necessary to place the society in a sound financial condition, and in other cases to indicate unmistakably to the members that the society to which they belong cannot be trusted to meet its engagements in the future.

(E. W. B.)

FRIENDS, Society of. See Quakers.

FRIES, Elias Magnus (1794–1878), an eminent Swedish botanist, was born at Småland, August 15, 1794. As his father, the pastor of the church at Femsjö, was a zealous and accomplished botanist, Fries during his walks with him early acquired an extensive knowledge of flowering plants; and about the age of twelve he was led by the discovery of a remarkably brilliant *Hydnum* to commence the study of the Agarics and other fungi. After attending school at Wexio, he in 1811 entered the university of Lund, where in 1814 he was elected docent of botany, and in 1824 professor. In 1834 he became professor of practical economy at Upsala, and in 1844 and 1848 he represented the university of that city at the Rigsdag. In 1851 he succeeded Wahlenberg as emeritus professor of botany at Upsala, and there, on the 8th February, 1878, he died, having only by a few days outlived the centenary of his illustrious predecessor Linnæus. Fries was admitted a member of the Swedish Royal Academy in 1847, and a foreign member of the Royal Society of London in 1875.

As an author on the Cryptogamia Fries occupies the first rank. He wrote *Novitiæ Floræ Suecicæ* (1814 and 1823); *Observationes Mycologicæ* (1815); *Flora Hollandica* (1817–18); *Systema Mycologicum* (1821–29); *Systema Orbis Vegetabilis*, not completed (1825); *Elenchus Fungorum* (1828); *Lichenographia Europæa* (1831); *Epricisis Systematis Mycologici* (1838; 2d ed., or *Hymenomycetes Europæi*, 1874); *Summa Vegetabilium Scandinaviæ* (1846); *Sveriges ätliga och giftiga Svampar*, with colored plates (1860); *Monographia Hymenomycetum Suecicæ* (1863), with the *Icones Hymenomycetum*, vol. i. (1867), and pt. i. vol. ii. (1877).

FRIES, Jacob Friedrich (1773–1843), a distinguished post-Kantian writer on philosophy, was born at Barby, Saxony, August 23, 1773. He was educated in a community of the Moravian Brethren, and in their seminary was trained for theology. In 1795 he entered at the university of Leipsic, and for some years studied philosophy there and at Jena. In 1801, after having acted for a time as private tutor, he began to deliver courses of philosophical lectures at Jena. These he continued with an interval of two years spent in travels in Germany, France, and Italy, till 1806, when he was called to Heidelberg as professor of philosophy and elementary mathematics. His philosophical position with regard to his contemporaries he had already made clear in the critical work *Reinhold, Fichte, Schelling* (1803), and in the more systematic treatises *System der Philosophie als evidenter Wissenschaft* (1804), *Wissen, Glauben, Ahndung* (1805). Fries was an unusally prolific and somewhat hurried writer, and during the ten years he passed at Heidelberg, he poured forth a variety of volumes, differing widely in value, on philosophy and theoretical physics. The most important treatise, and that by which he will always be remembered in the history of philosophy, was the *Neue Kritik der Vernunft*, 3 vols., 1807, an attempt to give a new foundation to the critical theory of Kant. In 1811 appeared his *System der Logik*, a very instructive work, and in 1814 *Julius and Evagoras*, a philosophical romance. In 1816 he was invited to Jena to fill the chair of theoretical philosophy, under which appear to have been included mathematics and physics, along with philosophy proper. In 1824 Fries was accused of democratic tendencies, and formally deprived of the right to deliver lectures on philosophical subjects, although he still retained his chair. He seems, however, towards the end of his life, to have resumed his philosophical teaching. He died on 10th August, 1843. The most important of the many works written during his Jena professorate are the *Handbuch der praktischen Philosophie* (vol. i., 1818, and vol. ii., 1832), the *Handbuch der psychischen Anthropologie*, 2 vols., 1820; *Mathematische Naturphilosophie*, 1822; *System der Metaphysik*, 1824; *Geschichte der Philosophie*, 1837 and 1840. Fries's point of view in philosophy may be described as a modified Kantianism. With Kant he regarded *Kritik*, or the critical investigation of the faculty of knowledge, as the essential preliminary to philosophy. But he differed from Kant both as regards the foundation for this criticism and as regards the metaphysical results yielded by it. Kant's analysis of knowledge had disclosed the *a priori* element as the necessary complement of the isolated *a posteriori* facts of experience. But it did not seem to Fries that Kant had with sufficient accuracy examined the mode in which we arrive at knowledge of this *a priori* element. According to him we only know these *a priori* principles through inner or pyschical experience; they are not then to be regarded as transcendental factors of all experience, but as the necessary constant elements discovered by us in our inner experience. They are, in fact, to Fries, as to the Scotch school, the residuum which resists analysis. Accordingly Fries, like the Scotch school, places psychology or analysis of consciousness at the foundation of philosophy, and called his criticism of knowledge an anthropological critique. It requires very little consideration to see that Fries's proposed amendment of Kantianism rests upon an altogether mistaken view of the transcendental element in knowledge. It is absurd to make the demand that what is *a priori* in cognition should be known by an *a priori* method. There is no such method. A second point in which Fries differed from Kant is the view taken as to the relation between immediate and mediate cognitions. According to Fries, the understanding is purely the faculty of proof; it is in itself void; immediate certitude is the only source of knowledge. Reason contains principles which we cannot demonstrate, but which can be deduced, and are the proper objects of belief. In this view of reason Fries approximates to Jacobi rather than to Kant. The *Neue Kritik* and the *Psychische Anthropologie* contain much that is admirable in the way of psychological analysis, but it cannot be thought that Fries has effected any real advance on the Kantian position. See Henke, *J. F. Fries*, 1867.

FRIESLAND, or VRIESLAND, sometimes called West Friesland, to distinguish it from East Friesland in Hanover, is the most northerly province of the Netherlands. It is bounded on the S.W., W., and N. by the Zuyder Zee and the North Sea, on the E. by the provinces of Groningen and Drenthe, and on the S.E. by that of Overyssel. The area is 1281 English square miles; and the population in 1875 was calculated at 317,405, being an increase since 1853 of 57,897. The chief town is Leeuwarden, a place of 27,085 inhabitants in 1876, and the province is divided into the three districts of Leeuwarden, Heerenveen, and Sneek. Other towns of importance are Harlingen, a seaport with 11,043 inhabitants; Weststellingwerf, 13,969; Opsterland, 13,753; Schoterland, 12,893; Sneek, 9990; and Franeker, 6643. For history, etc., see FRISIANS.

FRIGATE-BIRD, the name commonly given by our sailors, on account of the swiftness of its flight, its habit of cruising about near other species and of daringly pursuing them, to a large Sea-bird[1]—the *Fregata aquila* of most ornithologists—the *Fregatte* of French and the *Rabihorcado* of Spanish mariners. It was placed by Linnæus in the genus *Pelecanus*, and until lately its assignment to the family *Pelecanidæ* has hardly ever been doubted. Professor Mivart has, however, now declared (*Trans. Zool. Soc.*, x. p. 364) that, as regards the postcranial part of its axial skeleton, he cannot detect sufficiently good characters to unite it with that family in the group named by Professor Brandt *Steganopodes*. There seems to be no ground for disputing this decision so far as separating the genus *Fregata* from the *Pelecanidæ* goes, but systematists will probably pause before they proceed to abolish the *Steganopodes*, and the result will most likely be that the Frigate-Birds will be considered to form a distinct family (*Fregatidæ*) in that group. In one very remarkable way the osteology of *Fregata* differs from that of all other birds known. The furcula coalesces firmly at its symphysis with the carina of the sternum, and also with the coracoids at the upper extremity of each of its rami, the anterior end of each coracoid coalescing also with the proximal end of the scapula. Thus the only articulations in the whole sternal apparatus are where the coracoids meet the sternum, and the consequence is a bony framework which would be perfectly rigid did not the flexibility of the rami of the furcula permit a limited amount of motion. That this mechanism is closely related to the faculty which the bird possesses of soaring for a considerable time in the air with scarcely a perceptible movement of the wings can hardly be doubted, but the particular way in which it works has yet to be explained.

Two species of *Fregata* are considered to exist, though they differ in little but size and geographical distribution. The larger, *F. aquila*, has a wide range all round the world within the tropics, and at times passes their limits. The smaller, *F. minor*, appears to be confined to the eastern seas, from Madagascar to the Moluccas, and southward to Australia, being particularly abundant in Torres Strait,—the other species, however, being found there as well. Having a spread of wing equal to a Swan's and a comparatively small body, the buoyancy of these birds is very great. It is a beautiful sight to watch one or more of them floating overhead against the deep blue sky, the long forked tail alternately opening and shutting like a pair of scissors, and the head, which is of course kept to windward, inclined from side to side, while the wings are to all appearance fixedly extended, though the breeze may be constantly varying in strength and direction. Equally fine is the contrast afforded by these birds when engaged in fishing, or, as seems more often to happen, in robbing other birds, especially Boobies, as they are fishing. Then the speed of their flight is indeed seen to advantage, as well as the marvellous suddenness with which they can change their rapid course as their victim tries to escape from their attack. Before gales Frigate-Birds are said often to fly low, and their appearance near or over land, except at their breeding-time, is supposed to portend a hurricane.[2] Generally seen singly or in pairs, except when the prospect of prey induces them to congregate, they breed in large companies, and Mr. Salvin has graphically described (*Ibis*, 1864, p. 375) one of their settlements off the coast of British Honduras, which he visited in May, 1862. Here they chose the highest mangrove-trees[3] on which to build their frail nests, and seemed to prefer the leeward side. The single egg laid in each nest has a white and chalky shell very like that of a Cormorant's. The nestlings are clothed in pure white down, and so thickly as to resemble puff-balls. When fledged, the beak, head, neck, and belly are white, the legs and feet bluish-white, but the body is dark above. The adult females retain the white beneath, but the adult males lose it, and in both sexes at maturity the upper plumage is of a very dark chocolate-brown, nearly black, with a bright metallic gloss, while the feet in the females are pink, and black in the males—the last also acquiring a bright scarlet pouch, capable of inflation, and being perceptible when on the wing. The habits of *F. minor* seem wholly to resemble those of *F. aquila*. According to Bechstein, an example of this last species was obtained at the mouth of the Weser in January, 1792, and it has hence been included by some ornithologists among European birds! (A. N.)

FRISCHLIN, NICODEMUS (1547–1590), scholar and poet, was born on the 22d of September, 1547, at Balingen, Würtemberg, where his father was parish minister. He was educated at Tübingen, and in 1568 was promoted to the chair of poetry and history. In 1575 for his comedy of *Rebecca*, which he read at Ratisbon before the emperor Maximilian II., he was rewarded with the laureateship and with the honor of knighthood. Some time afterwards he was made a comes palatinus. In 1582 his unguarded language and his reckless life had made it necessary that he should leave Tübingen; he accordingly accepted a quiet mastership at Laibach in Carniola, which he held for about two years. Shortly after his return to the university in 1584, he was threatened with a criminal prosecution on a charge of immoral conduct, to which, it was alleged, he had exposed himself some years previously, and the threat led to his withdrawal to Frankfort in 1587. Of the remaining four years of his life little is recorded. For eighteen months he taught in the Brunswick Gymnasium, and he appears also to have resided occasionally at Strasburg, Marburg, and Mainz. From the last-named city he wrote certain libellous letters, which led to his being arrested in March, 1590, at the instance of the authorities of Würtemberg. He was imprisoned in the fortress of Hohenurach, near Reutlingen, where, on the night of the 29th of November, 1590, he was killed by a fall in attempting to let himself down from the window of his cell. His prolific and versatile genius produced a great variety of works, which entitle him to some rank both among poets and among scholars. In his Latin verse he has often successfully imitated the classical models; his comedies are not without freshness and vivacity; and some of his versions and commentaries, particularly those on the *Georgics* and *Bucolics* of Virgil, though now well-nigh forgotten, were important contributions to the scholarship of his time.

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[1] "Man-of-war-Bird" is also sometimes applied to it, and is perhaps the older name; but it is less distinctive, some of the larger Albatrosses being so called, and, in books at least, has generally passed out of use.

[2] Hence another of the names—"Hurricane-Bird"—by which the species is occasionally known.

[3] Capt. Taylor, however, found their nests as well on low bushes of the same tree in the Bay of Fonseca (*Ibis*, 1859, pp. 150–152).

No collected edition of his works has ever been published; to enumerate them exhaustively would be almost impossible. Among those most widely known may be mentioned the *Hebræis*, a Latin epic based on the Scripture history of the Jews; the *Elegiaca*, in twenty-two books; the *Opera Scenica*, consisting of six comedies and two tragedies; the *Grammatica Latina;* the versions of Callimachus and Aristophanes; and the commentaries on Persius and Virgil. See the monograph of Strauss (*Leben und Schriften des Dichters und Philologen Frischlen*, 1855).

FRISI, Paolo (1728–1784), a celebrated mathematician and astronomer, was born at Milan, April 13, 1728. At the age of fifteen he entered the monastery of the Barnabite friars, where, by self-instruction, he acquired a considerable knowledge of geometry. Under Professor Olivetano, at the university of Padua, he continued his mathematical studies. After a time he was sent to Lodi to give lectures on philosophy. When twenty-one years of age he composed a treatise on the figure of the earth, and the reputation which he soon acquired led to his appointment by the king of Sardinia to the professorship of philosophy in the college of Casale. His friendship with Radicati, a man of liberal opinions, occasioned Frisi's removal by his clerical superiors to Novara, where he was compelled to do duty as a preacher. In 1753 he was elected a corresponding member of the Paris Academy of Sciences, and shortly afterwards he became professor of philosophy in the Barnabite College of St. Alexander at Milan. An acrimonious attack by a young Jesuit, about this time, upon his dissertation on the figure of the earth laid the foundation of his animosity against the Jesuits, with whose enemies, including D'Alembert, Condorcet, and other Encyclopedists, he later closely associated himself. In 1756 he was appointed by Leopold, grand-duke of Tuscany, to the professorship of mathematics in the university of Padua, a post which he held for eight years. He was made in 1757 an associate of the Imperial Academy of St. Petersburg, and a foreign member of the Royal Society of London, and in 1758 a member of the Academy of Berlin, in 1766 of that of Stockholm, and in 1770 of the Academies of Copenhagen and of Bern. From several European crowned heads he received, at various times, marks of special distinction, and the empress Maria Theresa granted him a yearly pension of 100 sequins (£50). In 1764 he was created professor of mathematics in the Palatine Schools at Milan, and obtained from Pope Pius VI. release from ecclesiastical jurisdiction, and authority to become a secular priest. In 1766 he visited France and England, and in 1768 Vienna, and thus formed the acquaintance of the leading men of science of his day. Frisi was in 1777 made director of a school of architecture at Milan. His knowledge of hydraulics caused him to be frequently consulted with respect to the management of canals and other water-courses in various parts of Europe. It was through his means that lightning-conductors were first introduced into Italy for the protection of buildings. He was a man not only of extensive learning, but of wide views and fearless spirit, and by his lectures did much to dispel the popular superstitions of his fellow-countrymen concerning magic and witchcraft. He died November 22, 1784. He wrote—

Disquisitio mathematica in causam physicam figuræ et magnitudinis terræ, Milan, 1751; *Saggio della morale filosofia*, Lugano, 1753; *Nova electricitatis theoria*, Milan, 1755; *Dissertatio de motu diurno terræ*, Pisa, 1758; *Dissertationes variæ*, 2 vols. 4to, Lucca, 1759, 1761; *Del modo di regolare i fiumi e i torrenti*, Lucca, 1762; *Cosmographia physica et mathematica*, Milan, 1774, 1775, 2 vols. 4to, his chief work; *Dell architextura, statica e idraulica*, Milan, 1777; and other treatises.

See Verri, *Memorie . . . del signor dom Paolo Frisi*, Milan, 1787, 4to; Fabbroni, *Elogj d'illustri Italiani Atti di Milano*, vol. ii.

FRISIANS,—in classical Latin *Frisii*, in mediæval Latin *Frisones* or *Frisiones*, and on inscriptions of the later empire sometimes *Frisævones*,—a people of Teutonic stock, who at their first appearance in history, are found in possession of the same district of Europe which they still, at least partially, occupy. So far as can be judged they have never been of an aggressive disposition, and it is not improbable that at one time they may have possessed a much wider territory than history usually assigns them. The boundaries of Frisia proper are the Scheldt towards the west, and the Weser towards the east, and it never extended far inland from the coast of the German Ocean. But there is also a district of Schleswig in Denmark, extending along the west coast from the Eider northwards to Töndern, in which the common language still gives evidence of a Frisian population; the same may be said of the neighboring islands of För, Silt, Heligoland, etc.; and it is no improbable supposition that not only the Ditmarsch district to the south of the Eider, but also the whole maritime country westward to the Weser, was at an earlier period in the hands of distinctly Frisian tribes. If the presence of geographical names ending in *um*, the Frisian equivalent to the German *heim* and the Saxon *ham*, may be taken as sufficient evidence of Frisian occupation, Dr. Latham, in his notes to the *Germania* of Tacitus, has elaborately shown that there have been Frisian settlements as far north in Denmark as the Lijmfiord, and as far east as the islands of Funen and Zealand. By the older historians of Denmark and the countries of Lower Germany, the Frisian district in Denmark is frequently called *Frisia Minor* or Lesser Frisia, which, however, must not be confounded with the unexplained distinction which Tacitus makes between Frisii Majores and Frisii Minores.

The history of the Frisians, in spite of the labors of a few investigators like Wiarda and Richthofen, has hitherto been left in many respects in a very fragmentary and untrustworthy condition; and rash assertions of uncritical chroniclers have undisputed currency. For this neglect the principal reason is undoubtedly the fact that the people have, at least in modern times, displayed no strong political individuality, but have allowed themselves peacefully to be merged in more powerful nationalities. The reader who wishes may find the legendary history of the Frisian heroes traced from the 4th century B.C. in Furmius's *Annalium Phrisicorum Libri Tres*, Franeker, 1699, or in the quaintly-illustrated volumes of Westphal's *Scriptores rerum Danicarum*, which comprise Petrus Sax *De præcipuis rebus gestis Frisiorum septentrionalium breviter descriptis et iconice adumbratis libri sex;* Suffridus Petri *De antiq. et orig. Frisiorum;* Antonius Heimreich, *Supplementa ad Chronicon Frisiæ Septentr.*, etc.

The Frisians were so far rendered tributary by Drusus that they continued to pay to the Romans a tax of ox hides until the foolish exactions of Olennius, who demanded that all the hides should be of a certain superlative quality, drove them to revolt in 28 A.D. They defeated the Roman forces under Lucius Apronius, and though Corbulo obtained hostages for their future loyalty, and "gave them a senate, magistrates, and a constitution" (Tacitus, *Ann.* xi. 20), their subjugation was little more than nominal. About 57 A.D. a body of Frisians took possession of lands reserved for the Roman soldiers; and, instead of removing at the threat of the Roman governor, they sent their chiefs to Rome to obtain imperial sanction for their occupancy. In the 13th book of his *Annals*, Tacitus tells how the chiefs, Verritus and Malorix, as he calls them, excited the amusement and admiration of the people by taking, unasked, their seat among the senators in Pompey's theatre, when they heard that strangers from nations distinguished by their bravery and friendship to the Romans were advanced to that honorable position. Nero gave them both the Roman franchise, but refused to sanction the presumption of their tribe, who were afterwards expelled from the district which they had sought to colonize.

It is not till the new power of the Franks was beginning to lay the foundations of its empire that the Frisians again come prominently into notice; but it appears probable that in the mean time they had shared with their neighbors, the Angles and the Saxons, in the conquest of England and Scotland, though to what extent it is impossible to ascertain. The Frankish king Dagobert I. (622–638), sought to secure a footing among them by erecting a mission church at Utrecht on the Frisian frontiers, but the Frisians captured the place and destroyed the church. The preaching of Amandus and Eligius had little effect, and the honor of being the first successful missionary among the Frisians was left to Wilfrid of York, who in 677-678 was hospitably received by the king Aldegild (Adgillus or Aldgisl). Under Aldegild's successor Radbod a persecution of the new faith ensued, and though Radbod was driven from West Friesland by King Pippin, after the battle of Dorstadt in 689, he maintained his independence in Eastern Frisia, and Christianity was safe only as far as the wavering frontier of the Franks extended. On Pippin's death, Radbod not only recovered his western territory, but sailed up the Rhine as far as Cologne, and defeated Charles Martel. His successor, Aldegild II., was again driven eastward; the western districts fell finally into the power of the Franks; and Willibrord, the missionary, who had begun his labors in the country about 700, obtained a permanent see at Utrecht. The last independent prince of the Frisians, Poppo, was defeated by Charles Martel in 754, and Charlemagne still further extended the Frankish authority. At the same time he granted the Frisians important privileges, gave them the title of freemen, and allowed them to choose their own *podestat* (potestas), who should govern them under the protection of the empire. About this time the country of the Frisians was divided into three distinct districts:—Western Frisia, stretching from the Sincfal to the Fly or Flevum, that is, from the modern Zwin (a branch of the Scheldt northward of Bruges) to the Meuse; Middle Frisia, from the Fly to the Laubach, that is, from the Meuse to the Zuyder Zee: and Eastern Frisia, from the Zuyder Zee to the Weser. At the treaty of Verdun (843) Frisia went with Lotharingia; at the treaty of Mersen (870) the district between the Laubach and the Weser was assigned to the kingdom of the Eastern Franks, while the rest, with Lotharingia, passed to the kingdom of the Western Franks; in 880 the whole country was again united with Germany; and in 911, when Lotharingia recognized Charles, the king of the West, Frisia adhered to Conrad, the king of the East. The history of West Frisia gradually loses itself in that of the bishopric of Utrecht and the countship of Holland,—the first count of Holland, Thierry I., being the son of Gerulph, count of Frisia, and practically continuing the Frisian line. In 1248 William of Holland, having become emperor, restored to the Frisians in his country their ancient liberties in reward for the assistance they had rendered him in the siege of Aix-la-Chapelle; but in 1254 they revolted, and William lost his life in the contest which ensued. William IV. received a new donation of West Frisia in 1345. Meanwhile, the rest of the Frisians in the more eastern districts maintained their independence, and for a long time governed themselves after a very simple republican fashion. Each of the seven confederated Frisian maritime states—"Sieben Friesischen Seelande"—had its own administration, and consisted of a number of locally independent districts. For matters of general concern there was an annual assembly at the Upstalsbom, or "Tree of the Superior Court," near Aurich. According to Okko Leding, who in 1878 published at Emden an interesting study on *Die Freiheit der Friesen im Mittelalter, und ihr Bund mit den Versammlungen bei Upstalsbom*, it appears that these assemblies were allowed to fall into desuetude in the first half of the 13th century, were resumed from 1323 to 1327, anew discontinued, and again resumed in 1361. The counts disappear in East Frisia about the end of the 11th century, and in Middle Frisia after 1233. Though in religious matters nominally subject to the bishopric of Bremen, it was not till the crusade of 1234, and the famous defeat of the Stedingers (a people of the Weser marches) in the battle of Altenesch or Oldenesch, that the Frisians really recognized the authority of the Romish Church. In the course of the 14th century the whole country was in a state of anarchy; petty lordships sprang into existence, the interests of the common weal were forgotten or disregarded, and district carried on hostilities against district. Thus the Fetkoopers or Fatmongers, as they were called, of Ostergo, had endless feuds with the Schieringers or Eelfishers of Westergo.

This state of matters favored the attempts of the counts of Holland to push their conquests further, but the main body of the Frisians were still independent when the countship of Holland passed into the hands of Philip the Good of Burgundy. Philip laid claim to the whole country, but the people appealed to the protection of the empire, and Frederick III. in August, 1457, recognized their direct dependence on the empire, and called on Philip to bring forward formal proof of his rights. Philip's successor, Charles the Rash, summoned an assembly of notables at Enckhuysen in 1469, in order to secure their homage; but the conference was without result, and the duke's attention was soon absorbed by other and more important affairs. In 1498 Maximilian detached the country between the Laubach and the Fly from the empire, and gave it as a fief to Albert of Saxony, but it was the Schieringers alone (the name had by this time become the title of the popular faction) who submitted uncomplainingly to the arrangement, and the Fetkoopers, or faction of the nobility, had to be put down by force of arms. This the duke did with the utmost severity, and his successors carried out his despotic policy with only too faithful consistency.

In Eastern Frisia the anarchy was brought to a close by the formation of a confederation established in 1430, and the election of Edzard Cirksena to the office of president. Ulrich, the successor of Edzard, was made count of the country between the Ems and the Weser by the emperor Frederick III. in 1454. In the early part of the 16th century the Reformation was introduced by Edzard I., who patronized the preaching of Meister Jörgen von der Düre, or Magister Aportanus, as he was called in Latin. Under the Countess Anna, who ruled during the minority of her son Edzard II., the countship became, mainly through the agency of John a Lasco, the seat of a very flourishing Protestant church, and the refuge of the persecuted of many lands. Edzard II. proved an able ruler, published a body of laws for his people in 1515, introduced primogeniture into his family, extended his authority over Harlingerland and Jever, and was appointed by Charles V. governor of Groningen. His successor, Edzard III., was made a prince of the empire by Ferdinand III. in 1654. By the death of Charles Edzard, in 1744, the male line of the dynasty came to an end, and the king of Prussia took possession of the countship. After various vicissitudes, it was ceded to Hanover, in 1815.

The Frisian language is a member of the Low German branch of the Teutonic, and presents special interest to the English philologist as the nearest of all extant forms to the Saxon basis of his own tongue. It is still spoken in the country districts of the present province of West Friesland; in a much more Germanized condition it still exists in Saterland, in East Friesland; in strangely differentiated dialects it holds its own in many of the islands along the coast; and, in spite of the encroachments of Low German on the one hand, and Danish on the other, it survives in the country between Husum and Töndern. Among its peculiarities may be mentioned the dropping of the final *n*, which is such a favorite termination in German (thus even *ma* for *man*, as in Halbertsma, the proper name); the use of *sk* for the German *sch* and English *sh*, and of *t* for the German *k*; and, still more remarkable, the modification of *k* and *g* into *ts* when these letters precede *e* or *i*, as in tserke for kerke, *i.e.*, kirk, church. The explanation of this last peculiarity may perhaps be found in the contact of the Frisian with Slavonic languages, in which the modification is sufficiently common.

A brief sketch of Frisian grammar was published along with the poems of Gysbert Japicx; but the first separate treatment of the older forms of the language was by Rask, whose *Frisisk Sproglære* (Copenhagen, 1825; German translation by Buss, Freiburg, 1834) brought him into controversy with Grimm, who, in his *Deutschen Grammatik*, devoted some attention to the same subject. Moritz Heyne has also given a good treatment of Frisian in his *Kurze Laut- und Flexionslehre der Altgermanischen Sprachtstämme*, 1874. Richthofen's *Altfriesisches Wörterbuch*, Göttingen, 1840, practically supplanted the older work of Wiarda (Aurich, 1786), and its position has not been affected by the publication of Haan Hattema's *Idioticon Frisicum*, Leeuwarden, 1874. Outzen's *Glossarium der Friesischen Sprache* (unfortunately a posthumous publication from very illegible manuscripts), Copenhagen, 1837, deals mainly with North Frisian. For West Frisian we have the posthumous and incomplete *Lexicon Frisicum* (A–Feeor), by Justus Halbertsma, The Hague, 1874; and for East Frisian lexicography we have materials in Ehrentraut's *Friesisches Archiv*, Oldenburg, 1847–54, 2 vols., Posthumus and Halbertsma's *Onze reis naar Sageltesland*, Franeker, 1836, and J. Cadovius Müller's *Memoriale linguæ frisicæ*, written in the early part of the 18th century, and published by Dr. Kükelhan, 1875. J. ten Doornkaat Koolman began in 1877 a *Wörterbuch der Ostfriesischen Sprache*, which, along with much irrelevant matter, contains valuable contributions to the subject. The *Ostfriesisches Wörterbuch*, by Sturenburg (1857), is a dictionary, not of Frisian, but of the Low German spoken in East Friesland, which has incorporated comparatively few Frisian words. A list of Frisian personal names forms an appendix to Outzen's *Glossarium;* and Bernhard Brons, in his *Friesische namen und Mittheilungen Darüber*, Emden, 1877, furnishes lists of East, West, and North Frisian Christian names, and a collection of Frisian family names, with the dates at which they make their first appearance in church books or other historical documents.

For the older forms of the language the sources are unfortunately scanty: no great literary monument like that of the Heliand or the Nibelunglied has been preserved, and the investigator has mainly to depend on the various legal codes or collections which were formed in the course of the 14th and 15th centuries, and have have been published by Richthofen, *Friesische Rechtsquellen*, Berlin, 1840. The great *Lex Frisionum* is composed in Latin, and only contains a few Frisian terms, of comparatively small linguistic importance. The date of its recension is also a matter of conjecture, as there is no contemporary evidence either internal or external. By the older investigators it was assigned a high antiquity; but the more modern are for the most part of opinion that it is not earlier than the reign of Charlemagne. Haan Hettema in his *Oude Friesche Wetten* gives 802–804 as the probable date: while Richthofen thinks there are three portions, the first composed for use in Middle Frisia in the reign of Charles Martel or of Pippin, another for use in all Frisia, composed after Charlemagne's conquest in 785, and a third or supplementary and emendatory portion composed in 802. The first edition of the *Lex Frisionum* was published by B. J. Herold in his *Originum ac Germanicarum Antiquitatum libri*, Basel, 1557, but he gives no indication of the source of the manuscripts which he employed. Since his day there have been no fewer than 13 editions—Lindenbrog, *Codex legum Antiquarum*, Frankfort, 1613; Sibrand Siccama, *Lex Frisionum*, Franeker, 1617; Schotanus, *Beschryvinge van de Heerlyckheit van Frieslandt*, 1664; Gärtner, *Saxonum leges tres: accessit Lex Fris.*, Leipsic, 1730; Georgisch, *Corpus juris Germanici*, Halle, 1738; Schwartzenburg, *Groot Placaat en Charterboek van Vriesland*, Leeuwarden, 1768; Canciani, *Barbarorum leges antiquæ*, Venice, 1781; Walter, *Corpus juris German.*, Berlin, 1824; Gaupp, *Lex Fris.*, Breslau, 1732; Richthofen, *Friesische Rechtsquellen*, Berlin, 1840; De Wall, *Lex Fris.*, etc., Amsterdam, 1850; Hettema, *Oude Fr. Wetten*, Leeuwarden, 1851; and, finally, Richthofen in Pertz's *Mon. Germaniæ hist.*, vol. xv., Hanover, 1863. Though it has been supposed that Lindenbrog and Siccama may have had access to some manuscript authority in addition to Herold's recension, there is no proof that such was the case; and the text still remains to all intents in the same state as when Heröld left it. Some investigators have, owing to this absence of original evidence, even cast doubts on the authenticity of the code, but a comparison of the laws with undoubtedly genuine Frisian remains authorizes its acceptance. "I am convinced," says Richthofen, "that no man in the time of Herold, not to say in our own time, could have devised such a forgery as the Heroldian text." Among the minor collections of Frisian laws in Frisian, Low German, and Latin are the "seventeen general acts or *Küren*," dating from the close of the 12th century, according to Richthofen, but of much earlier origin according to Leding—the Upstalsbom laws of 1323, the local laws of Rüstring, and of the Brockmannen or inhabitants of Brockmerland, published by Wiarda; the "Emsiger Domen," or Emsig decisions, published by Hettema, Leeuwarden, 1830; the Fivelgo laws, published by Hettema, Dokkum, 1841; and the Hunsingo Küren in the 2d volume of the Groningen transactions of the society "pro excolendo jure patrio," 1778. The title chosen by Wiarda for the laws of Rüstring—the *Asegabuch*—though it has become perhaps the best known word of the whole Frisian vocabulary, is in reality not a genuine Frisian form, and never occurs in a Frisian document. The correct expression, according to Richthofen (*Altfries. Wörterbuch*, s.v. "Åsebok"), would have been *Asebok* or *Asékbok*, the former equivalent to the book out of which the "a" or law is to be *seen*, and the latter to the book in which the law is to be *sought*. In West Frisia the native language holds much the same relation to Dutch as the Scottish language holds to English in Scotland: it has no legal or educational position, but it preserves among the peasantry a considerable degree of vitality, and is even cultivated in a literary way by a small patriotic school. The chief place among West-Frisian authors is due to Gysbert or Gilbert Japicx, rector at Bolsward, whose *Friesche Rijmlerye* was first published at Bolsward in 1668, and has since been frequently reprinted—at Leeuwarden in 1681; at Franeker, 1684; with a glossary by Epkema, 2 vols., Leeuwarden. 1824; and under the editorship of Dykstra, 1853. The volume contains secular, and especially humorous, poems, fifty of the Psalms of David and other religious pieces, a number of letters, one or two prose essays, and fragments of the "Customs" of Leeuwarden. A popular comedy called *Waatze Gribbert's Brilloft*, or *Gribbert's Bridal*, dates from the beginning of the 18th century. The first edition appeared in 1812, at Leeuwarden, and the second in 1820, and there have been several since. Among the writers who have published in West Frisian during the 19th century, it is sufficient to mention Salverda Posthumus, J. H. Halbertsma, Deketh, Windsma, Van der Veen, and Dykstra. A society for the study of Frisian was founded in 1829 at Franeker—"Friesch genootschap voor geschied-oudheid-en taalkunde"—and since 1852 it has published a journal called *De Vrije Fries*. Other Frisian periodicals are *Forjit my net*, "Forget me not;" the *Swanne-blummen*, a Leeuwarden annual; and *De Byekoer*. In North Frisian the most valuable literary monument is *De gidt shals, i.e.*, the *Geizhals*, or *Curmudgeon*, a comedy, composed by J. P. Hunsen, in the Silt dialect. The minor remains have been collected by De Vries, in his *Nordfriesische Sprache nach der Moringer Mundart*, Leyden, 1860; and by Johansen in *Die Nordfriesische Sprache nach der Föhringer und Amrumer Mundart*, Kiel, 1862.

There is one book which, more than any other, has attracted the attention of other than Frisian scholars. If the *Oera Linda* book, as it is called, could be accepted as genuine, it would be, after Homer and Hesiod, the oldest document of European origin; but unfortunately it must be recognized as nothing more than a brilliant forgery. The first part of the manuscript, the book of the followers of Adela, professes to have been copied in 1256, from an ancient original, and gives an account of Neptune, Minerva, Minos, and other personages of classical antiquity, which would make them out to be of Frisian origin. According to J. Beckering Vinckers—who published *De Onechtheid van het Oera Linda bôk aangetoond uit de waartaal waarin het is geschreven*, in 1875, and *Wie heeft het Oera Linda Boek geschreven* in 1877—the real author is Cornelis Over de Linden, a ship-carpenter in the Royal docks at Den Helder, who was born in 1811, and died in 1873, and who appears to have forged the document for the purpose of giving importance to his invectives against the church, and of shedding dignity on his family, which is traced by the book back for about two thousand years.

Besides the works indicated above the following may be mentioned:—Ubbo Emmius, *Rerum Frisicarum historia*, Leyden, 1616; Pirius Winsemius, *Chronique . . . van Vriesland*, Franeker, 1622; Wiarda, *Ostfries Geschichte*, vols. 1–9, Aurich, 1791–1813, vol. 10, Bremen, 1817; Clement, *Lebens- u. Leidensgeschichte Frieslands der Friesen*, Kiel, 1845; Suur, *Geschichte der Häuptelinge Ostfrieslands*, Emden, 1846; Klopp, *Gesch. Ostfrieslands*, Weener, 1868–69; Friedländer, *Ostfries. Urkundenbuch*, Emden, 1874.

FRITH or FRYTH, JOHN (*cir.* 1503-1533), an eminent pioneer of the Reformation in England, was born about the beginning of the 16th century at Westerham, Kent, where his father kept an inn. He was educated at Eton, and afterwards at King's College, Cambridge, where Gardiner, who subsequently became bishop of Winchester, was his tutor. Immediately after taking his B.A. degree, he transferred his residence (December, 1525) to the newly founded college of St. Frideswide or Cardinal College (now Christ Church), Oxford, whither, along with other young men of distinguished talent, he had been invited by Wolsey. At Oxford the sympathetic interest which he showed in the Reformation movement in Germany soon caused him to be suspected as a heretic, and led to his imprisonment for some months. On being at the instance of Wolsey released from confinement, towards the close of 1526 or early in 1527, he fled to the Continent, where he appears to have resided chiefly at the newly founded Protestant university of Marburg, and to have been associated with Tyndal in many of the literary labors of the latter. At Marburg he became acquainted with several scholars and Reformers of note, and particularly with the famous Patrick Hamilton. Frith's first publication in fact was a translation of Hamilton's *Places*, made shortly after the martyrdom of their author; and soon afterwards the *Revelation of Antichrist*, a translation from the German, appeared, along with *A Pistle to the Christen Reader*, by "Richard Brightwall" (supposed to be Frith), and *An Antithesis wherein are compared togeder Christes Actes and our Holye Father the Popes*, dated "at Malborow in the lande of Hesse," 12th July, 1529. His *Disputacyon of Purgatorye*, a treatise in three books, against Rastell, Sir T. More, and Fisher (bishop of Rochester) respectively, was published at the same place in 1531. In 1532, probably in July or August, he ventured back to England, apparently on some business to which he and Tyndal attached importance in connection with the prior of Reading. Warrants for his arrest were almost immediately issued at the instance of Sir T. More, then lord chancellor. For some weeks Frith successfully evaded pursuit, but ultimately, in December, he fell into the hands of the authorities at Milton Shore in Essex, as he was on the point of making his escape to Flanders. The rigor of his imprisonment in the Tower was somewhat abated when

Sir T. Audley succeeded to the chancellorship, and it was understood that both Cromwell and Cranmer were disposed to show great leniency. But the treacherous circulation of a manuscript "lytle treatise" on the sacraments, which Frith had written for the information of a friend, and without any view to publication, served further to excite the hostility of his enemies, and in a Lent sermon preached against the "sacramentaries" before the king, special reference was made to some at that time in the Tower, "so bold as to write in defence of that heresy," and who seemed to be put there "rather for safeguard than for punishment." On this instigation, Henry ordered that Frith should be examined; the result of a regular trial which followed was that he was found guilty of having denied, with regard to the doctrines of purgatory and of transubstantiation, that they were necessary articles of faith. On the 23d of June, 1533, he was handed over to the secular arm, and at Smithfield on the 4th of July following he was burnt at the stake. During his captivity he had been more than usually busy with his pen, and his writings belonging to this period include, besides several letters of interest, a controversial work on the eucharist in reply to what Sir T. More had written against Frith's "lytle treatise;" also two tracts entitled respectively *A Mirror or Glass to know thyself*, and *A Mirror or Looking-glass wherein you may behold the Sacrament of Baptism*. Apart from his ability, which seems to have been regarded by all his contemporaries as extraordinary, his acquirements, his piety, his early and tragic death, Frith is an interesting and so far important figure in English ecclesiastical history as having been the first to maintain and defend that doctrine regarding the sacrament of Christ's body and blood which ultimately came to be incorporated in the English communion office. Twenty-three years after Frith's death as a martyr to the doctrine of that office, that "Christ's natural body and blood are in Heaven, not here," Cranmer, who had been one of his judges, went to the stake for the same belief. Within three years more, it had become the publicly professed faith of the entire English nation.

See the *Acts and Monuments* of Foxe; the collected edition of the *Works of Tyndal, Frith, and Barnes*, by Foxe (1573); *The Works of the English Reformers*, edited by Russell, vol. iii.; *British Reformers*, vol. viii.; *Fathers of the English Church*, vol. i.; Anderson's *Annals of the English Bible*, vol. iii.

FRITZLAR, a town formerly of Electoral Hesse and now of Prussia, at the head of a circle in the district of Cassel, about 16 miles S.S.W. of Cassel, on the left bank of the Eder, a left-hand sub-tributary of the Weser. It is an old-fashioned place still surrounded with watchtowers, and it possesses a large number of churches, an Ursuline nunnery, and an old Franciscan monastery, now partly used as a Protestant church and partly as a poorhouse. Its inhabitants, who according to the census of 1875 numbered 2965, are mainly engaged in agriculture, but also manufacture considerable quantities of earthenware. As early as 732 Boniface, the apostle of Germany, established the church of St. Peter's and a small Benedictine monastery at Frideslar, "the quiet home" or "abode of peace." Before long the school connected with the monastery became famous, and among its earlier scholars it numbered Sturm, abbot of Fulda, and Megingoz, bishop of Würzburg. When Boniface found himself unable to continue the supervision of the society himself, he entrusted the office to Wigbert of Glastonbury, who thus became the first abbot of Fritzlar. In 774 the little settlement was taken and burnt by the Saxons; but it evidently soon recovered from the blow. For a short time after 786 it was the seat of the bishopric of Buraburg, or Bürberge, which had been founded by Boniface in 741. At the diet of Fritzlar in 919 Henry I. was elected by the Franks and Saxons. In the beginning of the 13th century the village received municipal rights; in 1232 it was captured and burned by the landgrave, Conrad of Thuringia, and his allies; in 1631 it was taken by storm by William of Hesse; in 1760 it was successfully defended by General Luckner against the French; and in 1761 it was occupied by the French and unsuccessfully bombarded by the allies. As a principality Fritzlar continued subject to the archbishopric of Mainz till 1802, when it was incorporated with Hesse. From 1807 to 1814 it belonged to the kingdom of Westphalia; and in 1866 it passed with Hesse to Prussia.

FRIULI (in Italian, *Friuli;* in French, *Frioul;* in German, *Friaul;* and in the local dialect, *Furlanei*), a district at the head of the Adriatic, at present divided between Italy and Austria, the Italian portion being included in the province of Udine, and the Austrian comprising the countship of Görtz and Gradiska and the so-called Idrian district. In the north and east it is occupied by portions of the Julian and Carnian Alps, while the south is an alluvial plain richly watered by the Isonzo, the Tagliamento, and many lesser streams which, although of small volume during the dry season, come down in enormous floods after rain or thaw. The inhabitants known as Furlanians are probably in the main Latinized Celts, largely mingled with Italians on the one hand and Slovenians on the other. They speak a language much more akin to Latin than even Italian; details about which will be found in Pirona's *Attenenze della lingua friulana date per chiosa ad una iscrizione del 1103*, Udine, 1859, and *Vocabulario friulino*, Venice, 1869.

Friuli derives its name from the Roman town of Forum Julii, or Forojulium, which is said by Paulus Diaconus to have been founded by Julius Cæsar. In the 2d century B.C. the district was subjugated by the Romans, and became part of Gallia Transpadana. During the Roman period, besides Forum Julii, its principal towns were Concordia, Aquileia, Vedinium, and Næria. On the conquest of the country by the Lombards it was made one of their thirty-six duchies, the capital being Forum Julii or, as they called it, Civitas Austriæ. It is needless to repeat the list of dukes of the Lombard line, from Gisulf to Rodgaud, who fell a victim to his opposition to Charlemagne; their names and exploits may be read in Paulus Diaconus. The discovery, however, of Gisulf's grave at Cividale, in 1874, is interesting as proof of the historian's authenticity. Charlemagne naturally filled Rodgaud's place with one of his own followers, and the frontier position of Friuli gave the new line of counts, dukes, or margraves (for they are variously designated) the opportunity of acquiring importance by exploits against the Bulgarians, Slovenians, and other hostile peoples to the east. In the 11th century the ducal rights over the greater part of Friuli were bestowed by the emperor on the archbishop of Aquileia; but towards the close of the 14th century the nobles called in the assistance of Venice, which, after defeating the archbishop, afforded a new illustration of Æsop's well-known fable, by securing possession of the country for itself. The eastern part of Friuli was held by the counts of Görtz till 1500, when on the failure of their line it was appropriated by Maximilian I. By the peace of Campo Formio (1797) the Venetian district also came to Austria, and on the formation of the Napoleonic kingdom of Italy in 1805, the department of Passariano was made to include the whole of Venetian and part of Austrian Friuli, and a few years later the rest was added to the Illyrian provinces. The title of duke of Friuli was borne by Marshal Duroc. In 1814 the whole country was recovered by the emperor of Austria, who himself assumed the ducal title and coat of arms; and it was not till 1866 that the Venetian portion was again ceded to Italy by the peace of Nikolsburg.

See H. Palladius, *Rerum Foro-Juliensium Libri XII.*, Udine, 1659; Palladio degli Olivi, *Historia della provincia del Friuli*, Udine, 1660; *Memorie della geografia antica del Friuli*, Udine, 1775–1778; Gio. Lirati, *Notizie delle Cose del Friuli*, Udine, 1776–1777; Bianchi, *Documenti per la storia del Friuli, 1317-1332*, Udine, 1844–45, 3 vols., and his *Documenta historica Forojuliensia seculi XIII.*, Vienna, 1861; Czœrnig, "Ueber Friuli, seine Geschichte, Sprache, und Alterthümer," in the *Sitzungsberichte der philos.-hist. Classe*, Vienna, vol. x., 1853; Foscolo, *Relatione della patria del Friuli*, Venice, 1856.

FROBEN, Joannes (Latinized name *Frobenius*), a German printer and scholar, was born at Hammelburg in Franconia about 1460. After completing his university career with great distinction at Basel, he established a printing office in that city about the year 1491, and was the first German who brought the art to anything like perfection. He was on intimate terms of friendship with Erasmus, who not only had his own works printed by him, but superintended Frobenius's editions of St. Jerome, St. Cyprian, Tertullian, Hilary of Poitiers, and St. Ambrose. It was part of Frobenius's plan to have printed also editions of the Greek Fathers. He did not live to carry out this project, but it was very creditably executed by his son Jerome and his son-in-law Bisschop or Episcopius. Frobenius died in 1527, in consequence of an accident which had befallen him some years before. An extant letter of Erasmus, written in the year of Frobenius's death, gives an epitome of his life and an estimate of his character; and in it Erasmus mentions that his grief for the death of his friend was far more poignant than that which he had felt for the loss of his own brother. The epistle concludes with an epitaph in Greek and Latin.

FROBISHER, Sir Martin (*c.* 1535–1594), English navigator and explorer, was the fourth child of Bernard Frobisher, and was born, it is usually stated, at Doncaster, but more probably at Altofts in the parish of Normanton, Yorkshire, some time between 1530 and 1540. The family came originally from North Wales. Martin was sent to London to his mother's brother, Sir John York, and in 1554 went with a small fleet of merchant ships to Guinea under Admiral John Lock. We next hear of him in 1565 as Captain Martin Frobisher, and again in 1571 as superintending at Plymouth the building of a ship to be employed against the Irish. As early as 1560 or 1561 Frobisher had conceived the idea of discovering a north-west passage to Cathay, a short route to which was the motive of most of the Arctic voyages undertaken at that period and for long after. For years he schemed and plotted, and solicited in all quarters, from the court downwards, to obtain means to carry his favorite project into execution; and it was only in 1576 that, mainly by help of the earl of Warwick, he was put in command of two tiny barks, the "Gabriel" and "Michael," mere cockle shells of about 20 tons each, and a pinnace of 10 tons, with an aggregate crew of 35. On June 7 Frobisher left Blackwall, and having received a good word from Queen Elizabeth at Greenwich, the expedition, if we may apply to it so considerable a term, sailed northwards to the Shetland Islands. Stormy weather had been met with, in which the pinnace was lost, and some time after the "Michael" deserted. After passing Greenland and being nearly wrecked, the "Gabriel" reached the coast of Labrador on July 28. Some days later Hall's Island, at the mouth of Frobisher Bay, was reached, and a landing effected. Among the things hastily brought away by the men was some "black earth," which played an important part in connection with Frobisher's further career. Sailing up Frobisher Bay, then thought to be a strait, they reached Butcher's Island on August 18. Here some natives were met with, and intercourse carried on with them for some days, the result being that five of Frobisher's men were decoyed and captured, and never more seen. After vainly trying to get back his men, Frobisher turned homewards, and reached London on October 9. It seemed as if nothing more was to come of this expedition, when it was noised abroad that the apparently valueless "black earth" was really a lump of gold ore. It is difficult to say how this rumor arose, and whether there was any truth in it, or whether Frobisher was a party to a deception, in order to obtain means to carry out the great idea of his life. The story, at any rate, was so far successful; the greatest enthusiasm was manifested by the court and the commercial and speculating world of the time; and next year a much more important expedition than the former was fitted out, the queen lending Frobisher from the royal navy a ship of 200 tons. A Cathay company was established, with a charter from the crown, giving the company the sole right of sailing in every direction but the east; Frobisher was appointed high admiral of all lands and waters that might be discovered by him. The queen herself subscribed £1000, and the rest required was soon forthcoming. On May 26, 1577, the expedition, which, besides the royal ship, the "Aid" of 200 tons, consisted of the "Gabriel" and "Michael" of the previous year, with boats and pinnaces and an aggregate complement of 120 men, including miners, refiners, etc., left Blackwall, and sailing by the north of Scotland, arrived at Greenland early in July. Hall's Island was reached on the 18th, and though no more "black earth" was found there, abundance of it was found on other islands, and the ships well loaded with it. The country around under the name of *Meta Incognita*, was solemnly taken possession of in the queen's name. Several weeks were spent in Frobisher Bay collecting ore, but very little was done in the way of discovery. There was much parleying and some skirmishing with the natives, and earnest but futile attempts made on the part of Frobisher to recover the men captured the previous year. The return was begun on August 22, and the "Aid" reached Milford Haven on September 20; the "Gabriel" and "Michael," having separated, arrived later at Bristol and Yarmouth. Frobisher was received and thanked by the queen at Windsor. Great preparations were made and considerable expense incurred for the assaying of the great quantity of "ore" brought home, in the testing of which the queen manifested a strong personal interest. This took up much time, and led to considerable dispute among the various parties interested. Meantime the faith of the queen and others remained strong in the productiveness of Meta Incognita, and it was resolved to send out a larger expedition than ever, with all necessaries for the establishment of a colony of 100 men. The queen herself contributed two ships of 400 and 200 tons, manned with 150 men and carrying 120 pioneers. Besides these the fleet contained other 13 vessels of various sizes, carrying other 250 men, and the most elaborate and minute instructions were drawn up for the conduct of the expedition. Frobisher was again received by the queen at Greenwich, and her Majesty threw a fine chain of gold around his neck. On May 31, the expedition left Harwich, and sailing by the English Channel, reached Greenland on June 19. This time Frobisher and some of his men managed to land, "being the first known Christians that we have true notice of that ever set foot upon that ground." In the first days of July, Frobisher Bay was reached, but stormy weather and dangerous ice drove the fleet southwards, and unwittingly Frobisher entered what was afterwards known as Hudson Strait, up which he sailed about 60 miles. When he found that he was sailing away from his destination, he, with apparent reluctance, turned back, and after many buffetings part of the fleet managed to come to anchor in Frobisher Bay. Some attempt was made at founding a settlement, and immense quantities of ore were shipped. But, as might be expected, there was much dissension and not a little discontent among so heterogeneous a company, and on the last day of August the fleet set out on its return to England, which was reached in the beginning of October. Thus ended what was little better than a fiasco, though Frobisher himself cannot be held to blame for the result; the scheme was altogether chimerical, and the "ore" seems to have been not worth smelting. Between 1578 and 1585 we hear little of Frobisher, though he seems to have been doing service at various places, and steadily advancing in the good opinion of those in power. In 1580 he obtained the reversion of the clerkship of the royal navy, of no immediate value. In 1585 he commanded in the "Primrose" in Sir F. Drake's expedition to the West Indies, in the large booty brought home from which he no doubt had a good share. For the next year or two he was employed in various responsible services against the designs of Spain, and in 1588 he did such excellent work in the "Triumph" against the Spanish Armada that he was rewarded with the honor of knighthood. He continued to cruise about in the Channel until 1589, when he was sent in command of a small fleet to the coast of Spain. In 1591 he visited his native Altofts, and there married a daughter of Lord Wentworth. He had prospered during recent years and was able to become a landed proprietor in Yorkshire and Notts. But he found little leisure for a country life, and was soon on the seas again watching and cutting off the richly laden ships of Spain. In November, 1594, he took part in the siege of Crozan, near Brest, and received a wound from which he died at Plymouth on November 22. His body was taken to London and buried at St. Giles's, Cripplegate. Frobisher was brave ard skilful as a naval leader, and had the enthusiasm of the true explorer, but was characterized by much of the coarseness, and probably some of the unscrupulousness, of his time, and appears to have been somewhat rough in his bearing, and too strict a disciplinarian to be much loved. He justly takes rank among England's great naval heroes.

See Hakluyt's *Voyages*; the Hakluyt Society's *Three Voyages of Frobisher*; C. F. Hall's *Life with the Esquimaux*; Campbell's *Lives of the Admirals*; Rev. F. Jones's *Life of Frobisher*, and authorities mentioned therein. (J. S. K.)

FROEBEL, Friedrich Wilhelm August (1782–1852), philosopher, philanthropist, and educational reformer, was born at Oberweissbach, a village of the Thuringian Forest, the 21st April, 1782. He completed his seventieth year, on and died at Marienthal, near Bad-Liebenstein, on the 21st

June, 1852. Like Comenius, with whom he had much in common, he was neglected in his youth, and the remembrance of his own early sufferings made him in after life the more eager in promoting the happiness of children. His mother he lost in his infancy, and his father, the pastor of Oberweissbach and the surrounding district, attended to his parish but not to his family. Friedrich soon had a stepmother, and neglect was succeeded by stepmotherly attention; but a maternal uncle took pity on him, and gave him a home for some years at Stadt-Ilm. Here he went to the village school, but like many thoughtful boys he passed for a dunce. Throughout life he was always seeking for hidden connections and an underlying unity in all things. Nothing of the kind was to be perceived in the piecemeal studies of the school, and Froebel's mind, busy as it was for itself, would not work for the masters. His half-brother was therefore thought more worthy of a university education, and Friedrich was apprenticed for two years to a forester (1797–1799). Left to himself in the Thuringian Forest, Froebel now began to study nature, and without scientific instruction he obtained a profound insight into the uniformity and essential unity of nature's laws. Years afterwards the celebrated Jahn (the "Father Jahn" of the German gymnasts) told a Berlin student of a queer fellow he had met, who made out all sorts of wonderful things from stones and cobwebs. This queer fellow was Froebel; and the habit of making out general truths from the observation of nature, especially from plants and trees, dated from the solitary rambles in the Forest. No training could have been better suited to strengthen his inborn tendency to mysticism; and when he left the Forest at the early age of seventeen, he seems to have been possessed by the main ideas which influenced him all his life. The conception which in him dominated all others was the unity of nature; and he longed to study natural sciences that he might find in them various applications of nature's universal laws. With great difficulty he got leave to join his elder brother at the university of Jena, and there for a year he went from lecture-room to lecture-room hoping to grasp that connection of the sciences which had for him far more attraction than any particular science in itself. But Froebel's allowance of money was very small, and his skill in the management of money was never great, so his university career ended in an imprisonment of nine weeks for a debt of thirty shillings. He then returned home with very poor prospects, but much more intent on what he calls the course of "self-completion" (*Vervollkommung meines selbst*) than on "getting on" in a worldly point of view. He was soon sent to learn farming, but was recalled in consequence of the failing health of his father. In 1802 the father died, and Froebel, now twenty years old, had to shift for himself. It was some time before he found his true vocation, and for the next three and a half years we find him at work now in one part of Germany, now in another,—sometimes land-surveying, sometimes acting as accountant, sometimes as private secretary; but in all this his "outer life was far removed from his inner life," and in spite of his outward circumstancss he became more and more conscious that a great task lay before him for the good of humanity. The nature of the task, however, was not clear to him, and it seemed determined by accident. While studying architecture in Frankfort-on-the-Main, he became acquainted with the director of a model school who had caught some of the enthusiasm of Pestalozzi. This friend saw that Froebel's true field was education, and he persuaded him to give up architecture and take a post in the model school. In this school Froebel worked for two years with remarkable success, but he then retired and undertook the education of three lads of one family. In this he could not satisfy himself, and he obtained the parents' consent to his taking the boys to Yverdon, near Neuchatel, and there forming with them a part of the celebrated institution of Pestalozzi. Thus from 1807 till 1809 Froebel was drinking in Pestalozzianism at the fountain head, and qualifying himself to carry on the work which Pestalozzi had begun For the science of education had to deduce from Pestalozzi's experience principles which Pestalozzi himself could not deduce. And "Froebel, the pupil of Pestalozzi, and a genius like his master, completed the reformer's system; taking the results at which Pestalozzi had arrived through the necessities of his position, Froebel developed the ideas involved in them, not by further experience but by deduction from the nature of man, and thus he attained to the conception of true human development and to the requirements of true education" (Schmidt's *Geschichte der Pädagogik*).

Holding that man and nature, inasmuch as they proceed from the same source, must be governed by the same laws, Froebel longed for more knowledge of natural science. Even Pestalozzi seemed to him not to "honor science in her divinity." He therefore determined to continue the university course which had been so rudely interrupted eleven years before, and in 1811 he began studying at Göttingen, whence he proceeded to Berlin. But again his studies were interrupted, this time by the king of Prussia's celebrated call "to my people." Though not a Prussian, Froebel was heart and soul a German. He therefore responded to the call, enlisted in Lützow's corps, and went through the campaign of 1813. But his military ardor did not take his mind off education. "Everywhere," he writes, "as far as the fatigues I underwent allowed, I carried in my thoughts my future calling as educator; yes, even in the few engagements in which I had to take part. Even in these I could gather experience for the task I proposed to myself." Froebel's soldiering showed him the value of discipline and united action, how the individual belongs not to himself but to the whole body, and how the whole body supports the individual.

Froebel was rewarded for his patriotism by the friendship of two men whose names will always be associated with his, Langethal and Middendorf. These young men, ten years younger than Froebel, became attached to him in the field, and were ever afterwards his devoted followers, sacrificing all their prospects in life for the sake of carrying out his ideas.

At the peace of Fontainebleau (signed in May, 1814) Froebel returned to Berlin, and became curator of the museum of mineralogy under Professor Weiss. In accepting this appointment from the Government he seemed to turn aside from his work as educator; but if not teaching he was learning. More and more the thought possessed him that the one thing needful for man was unity of development, perfect evolution in accordance with the laws of his being, such evolution as science discovers in the other organisms of nature. He at first intended to become a teacher of natural science, but before long wider views dawned upon him. Langethal and Middendorf were in Berlin, engaged in tuition. Froebel gave them regular instruction in his theory, and at length, counting on their support, he resolved to set about realizing his own idea of "the new education." This was in 1816. Three years before one of his brothers, a clergyman, had died of fever caught from the French prisoners. His widow was still living in the parsonage at Griesheim, a village on the Ilm. Froebel gave up his post, and set out for Griesheim on foot, spending his very last groschen on the way for bread. Here he undertook the education of his orphan niece and nephews, and also of two more nephews sent him by another brother. With these he opened a school and wrote to Middendorf and Langethal to come and help in the experiment. Middendorf came at once, Langethal a year or two later, when the school had been moved to Keilhau, another of the Thuringian villages, which became the Mecca of the new faith. In Keilhau Froebel, Langethal, Middendorf, and Barop, a relation of Middendorf's, all married and formed an educational community. Such zeal could not be fruitless, and the school gradually increased, though for many years its teachers, with Froebel at their head, were in the greatest straits for money, and at times even for food. After 14 years' experience he determined to start other institutions to work in connection with the parent institution at Keilhau, and being offered by a private friend the use of a castle on the Wartensee, in the canton of Lucerne, he left Keilhau under the direction of Barop, and with Langethal he opened the Swiss institution. The ground, however, was very ill chosen. The Catholic clergy resisted what they considered as a Protestant invasion, and the experiment on the Wartensee and at Willisau in the same canton, to which the institution was moved in 1833, never had a fair chance. It was in vain that Middendorf at Froebel's call left his wife and family at Keilhau, and labored for four years in Switzerland without once seeing them. The Swiss institution never flourished. But the Swiss Government wished to turn to account the presence of the great educator; so young teachers were sent to Froebel for instruction, and finally Froebel moved to Burgdorf (a Bernese town of some importance, and famous from Pestalozzi's labors there thirty years earlier) to undertake the establishment of a public orphanage, and also to superintend a course of teaching for schoolmasters. The elementary teachers of the canton were to spend three months every alternate year at Burgdorf, and there compare experiences, and learn of distinguished men such as Froebel and Bitzius. In his conferences with these teachers Froebel found that the schools suffered from the state of the raw material brought into them. Till the school age was reached the children were entirely neglected. Froebel's conception of harmonious development naturally led him to attach much importance to the earliest years, and his great work on *The Education of Man*, published as early as 1826, deals chiefly with the child up to the age of seven. At Burgdorf his thoughts were much occupied with the proper treatment of young children, and in scheming for them a graduated course of exercises, modelled on the games in which he observed them to be most interested. In his eagerness to carry out his new plans he grew impatient of official restraints; so he returned to Keilhau, and soon afterwards opened the first *Kindergarten* or "Garden of Children," in the neighboring village of Blankenburg (1837). Firmly convinced of the importance of the Kindergarten for the whole human race, Froebel described his system in a weekly paper (his *Sonntagsblatt*) which appeared from the middle of 1837 till 1840. He also lectured in great towns; and he gave a regular course of instruction to young teachers at Blankenburg. But although the principles of the Kindergarten were gradually making their way, the first Kindergarten was failing for want of funds. It had to be given up, and Froebel, now a widower (he had lost his wife in 1839), carried on his course for teachers first at Keilhau, and from 1848, for the last four years of his life, at or near Liebenstein, in the Thuringian Forest, and in the duchy of Meiningen. It is in these last years that the man Froebel will be best known to posterity, for in 1849 he attracted within the circle of his influence a woman of great intellectual power, the Baroness von Marenholtz-Bülow, who has given us in her *Recollections of Friedrich Froebel* the only lifelike portrait we possess.

These seemed likely to be Froebel's most peaceful days. He married again, and having now devoted himself to the training of women as educators, he spent his time in instructing his class of young female teachers. But trouble came upon him from a quarter whence he least expected it. In the great year of revolutions, 1848, Froebel had hoped to turn to account the general eagerness for improvement, and Middendorf had presented an address on Kindergartens to the German Parliament. Besides this a nephew of Froebel's published books which were supposed to teach socialism. True, the uncle and nephew differed so widely that the "new Froebelians" were the enemies of "the old." The distinction was overlooked, and Friedrich and Karl Froebel were regarded as the united advocates of some new thing. In the reaction which soon set in Froebel found himself suspected of socialism and irreligion, and in 1851 the "cultus-minister" Raumer issued an edict forbidding the establishment of schools "after Friedrich and Karl Froebel's principles" in Prussia. This was a heavy blow to the old man, who looked to the Government of the "*Cultus-staat*" Prussia for support, and was met with denunciation. Of the justice of the charge the minister brought against Froebel the reader may judge from the account of his principles given below.

Whether from the worry of this new controversy, or from whatever cause, Froebel did not long survive the decree. His seventieth birthday was celebrated with great rejoicings in May, 1852, but he died in the following month, and lies buried at Schweina, a village near his last abode, Marienthal.

"All education not founded on religion is unproductive." This conviction of Froebel's followed naturally from his conception of the unity of all things, a unity due to the original Unity from whom all proceed and in whom all "live, move, and have their being." "In Allem wirkt und Schafft *Ein* Leben, Weil das Leben all' ein ein'ger Gott gegeben." "All has come forth from the divine, from God, and is through God alone conditioned. To this it is that all things owe their existence, to the divine working in them. The divine element that works in each thing is the true idea (*das Wesen*) of the thing." "The destiny and calling of all things is to develop their true idea, and in so doing to reveal God in outward and through passing forms."

As man and nature have one origin they must be subject to the same laws. Hence Froebel did what Comenius had done two centuries before him, he looked to the course of nature for the principles of human education. This he declares to be his fundamental belief: "In the creation, in nature and the order of the material world, and in the progress of mankind, God has given us the true type (*Urbild*) of education."

As the cultivator creates nothing in the trees and plants, so the educator creates nothing in the children,—he merely superintends the development of inborn faculties. So far Froebel agrees with Pestalozzi; but in one respect he went beyond him, and has thus become, according to Michelet, the greatest of educational reformers. Pestalozzi said that the faculties were developed by exercise. Froebel added that the function of education was to develop the faculties by arousing *voluntary activity*. Action proceeding from inner impulse (*Selbstthätigkeit*) was the one thing needful. And here Froebel as usual refers to God. "God's every thought is a work, a deed." As God is the Creator, so must man be a creator also. "He who will early learn to recognize the Creator must early exercise his own power of action with the consciousness that he is bringing about what is good, for the doing good is the link between the creature and the Creator, and the conscious doing of it is the conscious connection, the true living union of the man with God, of the individual man as of the human race, and is therefore at once the starting point and the eternal aim of all education." Again he says: "The starting point of all that appears, of all that exists, and therefore of all intellectual conception, is act, action. From the act, from action, must therefore start true human education, the developing education of the man; in action, in acting, it must be rooted and must spring up. . . . Living, acting, conceiving,—these must form a triple chord within every child of man, though the sound now of this string, now of that, may preponderate, and then again of two together."

The prominence which Froebel gave to action, his doctrine that man is primarily a doer and even a creator, and that he learns only through "self-activity," may produce great changes in educational methods generally, and not simply in the treatment of children too young for schooling. But it was to the first stage of life that Froebel paid the greatest attention, and it is over this stage that his influence is gradually extending. Froebel held with Rousseau that each age has a completeness of its own, and that the perfection of the later stage can be attained only through the perfection of the earlier. If the infant is what he should be as an infant, and the child as a child, he will become what he should be as a boy, just as naturally as new shoots spring from the healthy plant. Every stage, then, must be cared for and tended in such a way that it may attain its own perfection. Impressed with the immense importance of the first stage, Froebel like Pestalozzi devoted himself to the instruction of mothers. But he would not, like Pestalozzi, leave the children entirely in the mother's hands. Pestalozzi held that the child belonged to the family; Fichte, on the other hand, claimed it for society and the state. Froebel, whose mind like that of Frederick Maurice delighted in harmonizing apparent contradictions, and who taught that "all progress lay through opposites to their reconciliation," maintained that the child belonged both to the family and to society, and he would therefore have children spend some hours of the day in a common life and in well-organized common employments. These assemblies of children he would not call schools, for the children in them ought not to be old enough for schooling. So he invented the name *Kindergarten*, garden of children, and called the superintendents "children's gardeners." He laid great stress on every child cultivating its own plot of ground, but this was not his reason for the choice of the name. It was rather that he thought of these institutions as enclosures in which young human plants are nurtured. In the Kindergarten the children's employment should be *play*. But any occupation in which children delight is play to them; and Froebel invented a series of employments, which, while they are in this sense play to the children, have nevertheless, as seen from the adult point of view, a distinct educational object. This object, as Froebel himself describes it, is "to give the children employment in agreement with their whole nature, to strengthen their bodies, to exercise their senses, to engage their awakening mind, and through their senses to bring them acquainted with nature and their fellow creatures; it is especially to guide aright the heart and the affections, and to lead them to the original ground of all life, to unity with themselves."

At the end of the first quarter of a century since Froebel's death, the spread of his ideas, or at least of his methods, seems rapidly extending. Prophets are slowly recognized in their own country, and although he is so thoroughly German in his mode of thought and exposition that, as Deinhardt says, no other nation could have produced such a man, the Germans as yet are not so ready to learn from Froebel as from the Swiss Pestalozzi. In Austria the Kindergarten has made more way than in Prussia, and it seems to prosper in America. But Froebel's influence is not limited to the Kindergarten. His conception of education cannot but affect the thoughts and ultimately the practice of all teachers who will be at the pains to understand it.

Froebel's own works are—1. *Menschenerziehung* (there is a French translation by the Baronne de Crombrugghe); 2. *Pädagogik d. Kindergartens;* 3. *Kleinere Schriften,* herausgegeben von Wichard Lange; and 4. *Mutter- und Koselieder.* We have a lengthy but unsatisfactory life in A. B. Hanschmann's *Friedrich Fröbel.* An unpretentious but useful little book is *F. Froebel, a Biographical Sketch,* by Matilda H. Kriege, New York (Steiger). A very good account of Froebel's life and thoughts is given in Karl Schmidt's *Geschichte d. Pädagogik,* vol. iv.; also in Adalbert Weber's *Geschichte d. Volksschulpäd. u. d. Kleinkindererziehung* (Weber carefully gives authorities). For a less favorable account see K. Strack's *Geschichte d. deutsch. Volksschulwesens.* The article "Fröbel" in K. A. Schmid's *Encyklopädie* is by Deinhardt. Frau von Marenholtz-Bülow has published her *Erinnerungen an F. Fröbel* (a book which has been translated by Mrs. Horace Mann). This lady, who has been the chief interpreter of Froebel, has expounded his principles in *Das Kind u. sein Wesen,* and *Die Arbeit u. die neue Erziehung.* In England Miss E. Shirreff has published *Principles of Froebel's System,* and a short sketch of Froebel's life. The late Joseph Payne advocated Froebelism in a pamphlet, *Froebel and the Kindergarten System;* also in the book published since his death, *A Visit to German Schools.* In the United States, Miss E. E. Peabody, who has taken an active part in the spread of Froebelism, has written *Moral Culture of Infancy* (New York). W. N. Hailman treats of Froebel in his *Lectures* and his *Kindergarten Culture* (Cincinnati). A. Köhler's *Praxis* is the best known German work on the Kindergarten (it is translated as *Kindergarten Education,* New York); and T. F. Jacobs's *Manuel* is the best in French. (R. H. Q.)

FROG, the common name of an extensive group of Batrachians forming, along with the toads, the amphibian order *Anoura.* They are divided into 9 families, containing 92 genera and 440 species, and are found in all quarters of the globe, being most abundant in the tropical and subtropical regions, but also occurring within the Arctic circle. Most of the families have a very limited distribution, and only two of them, the true frogs (*Ranidæ*), of which there are 150 species, and the *Polypedatidæ,* a family of tree-frogs containing 124 species, can be regarded as almost cosmopolitan. The neotropical or South American region is richest in peculiar forms, while it possesses some only found beyond it in the widely remote Australian region; thus the *Pelodryadæ,* a family of tree-frogs, is peculiar to the two; the genus *Litoria* is confined to Australia, with the exception of a single species occurring in Paraguay; while the only frog known in New Zealand has its nearest allies in South America. Those regions bear also a negative resemblance in the total absence from both of the genus *Rana,* the 60 species of which are distributed throughout the other quarters of the globe. These facts, among others, have been adduced in support of the theory that at one time the continents of South America and Australia had a land connection. Frogs are almost totally absent from oceanic islands, a single species (*Liopelma Hochstetteri*) occurring in New Zealand, and one or two others in the Pacific islands, as far east as the Fijis, beyond which they are unknown. On the assumption that those islands obtained their present fauna from the nearest continental land, the absence of frogs can be readily explained by the fact that salt water is alike fatal to the adult frog and to its spawn, and thus formed an insuperable barrier to their migration.

Frogs, as is shown by their wide distribution, are capable of enduring a considerable degree of both heat and cold; they are, however, altogether intolerant of long-continued drought, a desert forming as certain a barrier to their migration as an ocean. Both during their larval stage and afterwards, for the purpose of cutaneous respiration, abundant moisture is a necessity of their existence; consequently, whether they live on the ground or on trees, they are never found far from rivers, marshes, or lakes. In winter the frogs of northern climates hibernate, burying themselves in the mud at the bottom of pools, and lying clustered together in a state of complete torpidity. In hot climates they are said to go into a similar condition, known as "æstivation," during periods of exceptional heat and drought, in order to retard the dissipation of the moisture in their bodies. On reappearing from their long winter sleep the work of reproduction is at once entered upon, the males making their presence known to the females by the vigorous exercise of their vocal organs. The croaking of the common frog can only be regarded as pleasant from its association with the welcome advent of spring; still more unpleasant, however, is the much louder croak of the edible frog of the Continent, the species to which Horace probably refers in the lines

> . . . "ranæque palustres
> Avertunt somnos."

The eggs of the frog, consisting of little black specks surrounded by an albuminous envelope, are fertilized during their extrusion from the body of the female, and are generally deposited at the bottom of the water, ascending, however, soon after to the surface, owing to the swelling and partial decomposition of the glairy substance surrounding the ova. There are several species known in which the eggs are deposited in an exceptional manner. Those of a small frog (*Alytes obstetricans*) found in France and Germany form a long chain, which the male twines round his thighs, retiring with them into seclusion until the young are ready to leave, when he enters the water, and the tadpoles immediately make their escape. The female of an American tree-frog (*Nototrema marsupiatum*) has a pouch along the whole extent of its back for the reception of its eggs; and Professor Peters of Berlin has recently drawn attention to a tree-frog of the genus *Polypedates* found in tropical West Africa, in which the female, after depositing her eggs in the usual mass of albuminous jelly, attaches them to the leaves of trees overhanging a dry water-hole or pool. The albumen speedily dries and forms a horny coating on the leaf, under which lie the unimpregnated eggs. On the advent of the rainy season the albumen becomes softened, and the eggs are washed into the pool below, now filled with water, where they are fecundated by the male.

The development of the egg after impregnation proceeds more or less rapidly according to the temperature, the young of the common frog being hatched, according to Rusconi, in 4 days, in a temperature varying from 70° to 80° Fahr., while in the climate of England this does not take place in less than a month. The creature which emerges from the egg is altogether unlike a frog, consisting mainly of a bulky head and tail, and wholly destitute of limbs. This is the tadpole or larval stage in the development of the frog, when it is essentially a fish, capable only of existing in water, breathing by gills, and having like a fish a two-chambered heart. At first the gills or branchiæ are external, but they are soon withdrawn within the branchial cavity, and concealed by an opercular membrane. As the process of development proceeds, the limbs begin to bud forth, the posterior pair appearing first; and with their growth the tail begins to dwindle, not falling off, but being gradually absorbed. At the same time vast changes are taking place in the blood-vascular system, the gills gradually disappearing, two lungs being developed, and the heart becoming three-chambered as in reptiles. The young frog must now come to the surface to breathe, and soon leaves the water altogether. On emerging from the egg, the tadpole at first feeds upon the gelatinous mass which before had formed a protective covering. It is unprovided with teeth, but has two minute horny jaws, which enable it to feed on decaying animal and vegetable matter. According to Bell (*British Reptiles*), tadpoles sometimes kill and feed upon each other. "I observed," he says, "that almost as soon as one had acquired its limbs it was found dead at the bottom of the water, and the remaining tadpoles feeding upon it. This took place with all of them successively, excepting the last, which lived on to complete its change." After leaving the water they feed almost entirely on insects and slugs.

The form of the frog is too well known to require description, but there are many almost unique features in its organization that may be noticed. Respiration in the adult frog is partly pulmonary; but as it is destitute of ribs, this operation in the frog cannot be performed by the alternate expansion and contraction of the chest, as in other air-breathing animals. The air has to be swallowed in order to be conveyed to the lungs, and the mechanism by which this operation is performed necessitates the closing of its mouth and the admission of air by the nostrils, so that a frog can be most readily suffocated by having its mouth gagged open. Respiration is also partly cutaneous, experiment having shown that the skin gives off carbonic acid gas in sufficient quantity to enable the creature to live for a very considerable time after pulmonary respiration has been stopped. Moisture is as necessary to the skin in the performance of this function as it is to the gills of a fish; and in order to preserve to the utmost its humidity, frogs avoid as much as possible the hot sunlight, sheltering themselves beneath stones or under loose turf, and reappearing on the advent of rain, sometimes in such numbers in a single locality as to have given rise to stories of frog showers. The skin of the frog, however, readily absorbs water; and this it stores up in an internal reservoir, from which it can in seasons of drought moisten the surface of its skin. When a frog is suddenly caught it frequently ejects a quantity of water, and thus suddenly diminishes its volume. The water voided is not urine, nor is the receptacle containing it the urinary bladder, as was at one time supposed. The skin of frogs is perfectly smooth, having neither plates nor scales, except in the American genus *Ceratophrys* (fig. 1), in certain species of which a few bony plates are enclosed in the skin of the back. The tongue in frogs is probably employed more for the capture of its insect prey, than as the organ of taste. It is fixed in front of the mouth, and free behind, and in seizing its prey, the free end, which possesses a viscid secretion, is darted suddenly forward, the captured insect being as suddenly transported to the back part of the mouth. Nothing can exceed the rapidity with which this motion is performed. Minute teeth are present in the upper jaw, and on the palate, in the true frogs. The vocal organs by which the characteristic croaking is produced differ somewhat in different species, a similar variety appearing in the quantity and quality of their song. The male of the edible frog is provided with bladder-like cheek pouches—the so-called vocal sacs—which it distends with air when in the act of croaking, an operation which it performs to such purpose as to have received the name of "Dutch nightingale" on the Continent, and "Cambridgeshire nightingale" in England. The bull-frog (*Rana mugiens*) has a laryngeal mechanism which Cuvier compared to a kettledrum, by which it produces a sound not unlike the bellowing of a bull. The sound produced by the tree-frogs is both loud and shrill, but in certain circumstances it seems to be somewhat pleasing. Thus Darwin says, "Near Rio de Janeiro I used often to sit in the evening to listen to a number of little *Hylæ*, which, perched on blades of grass close to the water, sent forth sweet chirping notes in harmony." The voice of another tree-frog (*Hyla crepitans*) has been compared to the sound produced "by the cracking of a large piece of wood;" while another, belonging to Surinam, has an extremely disagreeable voice, and unfortunately so much of it that, when a number of them combine, they at times drown the orchestra of the Paramaribo theatre. No frog, so far as yet known, possesses any poison organs. A species found in France (*Pelobates fuscus*), when disturbed, emits a strong odor, somewhat resembling garlic, and of sufficient pungency to make the eyes water; another (*Hyla micans*) exudes from the surface of its body a slimy substance having luminous properties, which probably acts as a defence by frightening its enemies. Many of the tree-frogs are of a green color, while others are brown, "and these," says Mr. Wallace (*Tropical Nature*, 1878), "usually feed at night, sitting quietly during the day so as to be almost invisible, owing to their color and their moist shining skins so closely resembling vegetable substances." The majority of tree-frogs have their color thus adapted to their surroundings, and are thus enabled the more readily to elude their enemies; for, so far as yet known, all the species protectively colored are edible, forming the chief food of many mammals, birds, and reptiles. A few, however, are brilliantly and conspicuously colored, as if courting observation; and such species, there is reason to believe (the reader will find evidence of this in Belt's *Naturalist in Nicaragua*), are rejected by frog-eating animals on account of their nauseous secretions, or some other unknown property which renders them unpalatable. The bright colors thus become directly useful to the species by making them readily recognizable as uneatable.

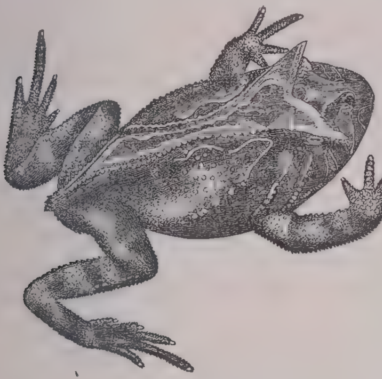

Fig. 1.—*Ceratophrys granosa.*

The Common Frog (*Rana temporaria*) is the most widely distributed species of the group, occurring throughout the temperate regions of both hemispheres, including North Africa, and Asia as far east as Japan. It does not occur in Iceland. Both in England and in Scotland it is abundant, nor is it uncommon in Ireland, although popularly supposed to be absent from that island. It varies very considerably in color, being either a reddish, yellowish, or greenish-brown above, with irregular spots and fasciæ, and of a lighter color beneath, but having almost invariably an oblong patch of brown behind the eyes, by which it may be readily distinguished from other European species. Although not an article of human food, the common frog in its various stages of growth forms the staple diet of many other animals. The tadpoles are eaten by newts and the smaller fishes, and frogs of all ages by weasels, waterfowl, pike, and snakes. By those agencies their numbers, which otherwise would be enormous, are greatly reduced. This species is said to take five years in attaining its full growth, and to live for about fifteen years. Like the toad it can be rendered tame and domesticated, having been known to take up its abode in a moist corner of a kitchen, and to come forth regularly at meal time to be fed. The Edible Frog (*Rana esculenta*) is very widely distributed throughout the temperate regions of the earth, but is not found in America, where, however, a closely allied species occurs (fig. 2). It is found in England, where it was first observed in a Cambridgeshire fen in 1843, to which probably it had been introduced from the Continent. It has since been introduced into various parts of the south of England, but apparently without much success, the summer heat there being, it is said, insufficient to enable the tadpole to attain its full development before the advent of autumnal cold. It may be readily distinguished from the common species by the yellowish mesial line which runs down the whole

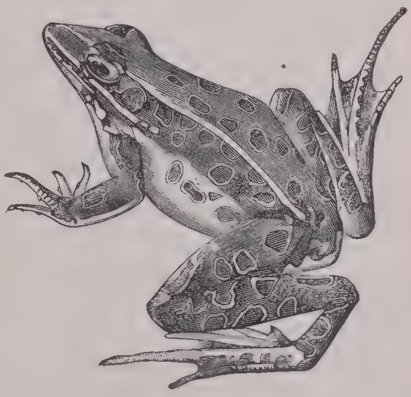

Fig. 2.—*Rana palustris.*

length of its back, by the absence of the characteristic brown spot behind the eyes, and by the presence in the males of "vocal sacs." It is also more aquatic than the common frog, seldom leaving the banks of its native pond or stream, into which it is always ready to dip on the slightest appearance of danger. It is very abundant throughout central and southern Europe, and forms, especially in France, a valued article of food, the hind legs when cooked being regarded as a luxury. Regarding a dish of these, Mr. F. Buckland says, "Most excellent eating they were, tasting more like the delicate flesh of the rabbit than anything else I can think of." The edible frog has been lately introduced into Ireland. The Bull-frog (*Rana mugiens*) is one of the largest species, measuring sometimes 8 inches in length, exclusive of the hind legs, and having a gape sufficiently wide to swallow ducklings whole. It inhabits North America, where it is said to haunt the pools formed at the origin of springs, the waters of which it was supposed to keep pure—a belief which long afforded it considerable protection; lately, however, the Americans have taken to frog-eating, and the bull-frog, in the absence of *R. esculenta,* has been selected among others for this purpose.

The Tree-frogs (fig. 3) are readily distinguished from all others by having the ends of their toes dilated into knobs or discs, generally provided with a sticky secretion, by means of which they can cling to the leaves and branches of trees. They are small, elegant, and exceedingly active creatures, the males possessing loud voices, of which they make copious use during the breeding season and on the approach of rain. Frogs have from remote times been regarded as weather prophets, and at the present day, in some parts of Germany, the European Tree-frog (*Hyla aborea*) is used as a barometer. A few of them are placed in a tall bottle provided with miniature ladders, the steps of which they ascend during fine weather, seeking the bottom again on the approach of rain. All frogs, whether arboreal or not, have their hind feet webbed, and in at least one tree-frog (*Rhacophorus*) the webs on all the feet are so largely developed as to render it probable that by their means the frog is able to execute flying leaps. This "flying frog" was brought to Mr. Wallace, while travelling in Borneo, by a Chinaman, who assured him "that he had seen it come down in a slanting direction as if it flew." Its body was about 4 inches in length, and the expanded webs of each hind foot covered a space of 4 square inches, while its forelegs were bordered by a membrane—features highly suggestive of aërial locomotion.

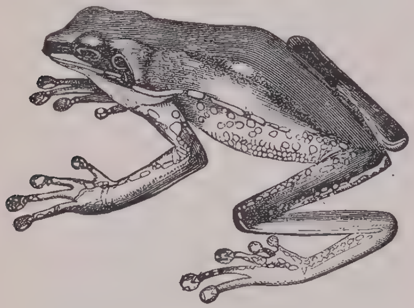
Fig. 3.—Tree-frog (*Hyla bicolor*).

Fossil remains of the frog do not occur in strata older than the Tertiary, being found in greatest abundance in the Miocene deposits. See Amphibia. (J. GI.)

FRÖHLICH, Abraham Emanuel (1796–1865), a German-Swiss poet, was born February 1, 1796, at Brugg, in the canton of Aargau, where his father was a teacher. At the age of fifteen he was sent to study theology in the academy of Zürich. In 1817 he was ordained, and returned as teacher to his native town, where he lived for ten years. He was then appointed professor of German language and literature in the canton-school at Aarau, which post he lost, however, in the political quarrels of 1830. He afterwards obtained the post of teacher and rector of the Bezirksschule, and was also appointed Hülfsprediger. He died December 1, 1865. His works are—170 *Fabeln* (1825); *Schweizerlieder* (1827); *Das Evangelium St. Johannis, in Liedern* (1830); *Elegien an Wieg' und Sarg* (1835); *Die Epopöen: Ulrich Zwingli* (1840); *Ulrich von Hutten* (1845); *Auserlesene Psalmen und Geistliche Lieder für die Evangelisch-reformirte Kirche des Cantons Aargau* (1844); *Ueber den Kirchengesang der Protestanten* (1846); *Trostlieder* (1852); *Der Junge Deutsch-Michel* (1846); *Reimsprüche aus Staat, Schule, und Kirche* (1820). An edition of his collected works, in 5 vols., was published in 1853. Fröhlich is best known for his two heroic poems, *Ulrich Zwingli* and *Ulrich von Hutten,* and especially for his fables, which have been ranked with those of Hagedorn, Lessing, and Gellert.

FROISSART, Jean (1337–1410?). The personal history of Froissart, the circumstances of his birth and education, the incidents of his life, must all be sought in his own verses and chronicles. He possessed in his own lifetime no such fame as that which attended the steps of Petrarch; when he died it did not occur to his successors that a chapter might well be added to his *Chronicle* setting forth what manner of man he was who wrote it. The village of Lestines, where he was curé, has long forgotten that a great writer ever lived there. They cannot point to any house in Valenciennes as the lodging in which he put together his notes and made history out of personal reminiscences. It is not certain when or where he died, or where he was buried. One church, it is true, doubtfully claims the honor of holding his bones. It is that of St. Monegunda of Chimay.

Gallorum sublimis honos et fama tuorum,
Hic Froissarde, jaces, *si modo forte jaces.*

It is fortunate, therefore, that the scattered statements in his writings may be so pieced together as to afford a tolerably connected history of his life year after year. The personality of the man, independently of his adventures, may be arrived at by the same process. It will be found that Froissart, without meaning it, has portrayed himself in clear and well-defined outline. His forefathers were *jurés* of the little town of Beaumont, lying near the river Sambre, to the west of the forest of Ardennes. Early in the 14th century the castle and seigneurie of Beaumont fell into the hands of Jean, younger son of the count of Hainault. With this Jean, sire de Beaumont, lived a certain canon of Liége called Jean le Bel, who, fortunately, was not content simply to enjoy life. Instigated by his seigneur he set himself to write contemporary history, to tell "la pure veriteit de tout li fait entièrement al manire de chroniques." With this view, he compiled two books of chronicles. And the chronicles of Jean le Bel were not the only literary monuments belonging to the castle of Beaumont. A hundred years before him Baldwin d'Avernes, the then seigneur, had caused to be written a book of chronicles or rather genealogies. It must therefore be remembered that when Froissart undertook his own chronicles, he was not conceiving a new idea, but only following along familiar lines.

Some 20 miles from Beaumont stood the prosperous city of Valenciennes, possessed in the 14th century of important privileges and a flourishing trade, second only to places like Bruges or Ghent, in influence, population, and wealth. Beaumont, once her rival, now regarded Valenciennes as a place where the ambitious might seek for wealth or advancement, and among those who migrated thither was the father of Froissart. He appears from a single passage in his son's verses to have been a painter of armorial bearings. There was, it may be noted, already what may be called a school of painters at Valenciennes. Among them were Jean and Colin de Valenciennes and André Beau-Neveu, of whom Froissart says that he had not his equal in any country.

The date generally adopted for his birth is 1337. In after years Froissart pleased himself by recalling in verse the scenes and pursuits of his childhood. These are presented in vague generalities. There is nothing to show that he was unlike any other boys, and unfortunately it did not occur to him that a photograph of a schoolboy's life amid bourgeois surroundings would be to posterity quite as interesting as that faithful portraiture of courts and knights which he has drawn up in his *Chronicle.* As it is, we learn that he loved games of dexterity and skill rather than the sedentary amusements of chess and draughts, that he was beaten when he did not know his lessons, that with his companions he played at tournaments, and that he was always conscious—a statement which must be accepted with suspicion—that he was born

"Loer Dieu et servir le monde."

In any case he was born in a place, as well as at a time, singularly adapted to fill the brain of an imaginative boy. Valenciennes, at the present day a dull town, was then a city extremely rich in romantic associations. Not far from its walls was the western fringe of the great forest of Ardennes, sacred to the memory of Pepin, Charlemagne, Roland, and Ogier. Along the banks of the Scheldt stood, one after the other, not then in ruins, but bright with banners, the gleam of armor, and the liveries of the men at arms, castles whose seigneurs, now forgotten, were famous in their day for many a gallant feat of arms. The castle of Valenciennes itself was illustrious in the romance of *Perceforest:* there was born that most glorious and most luckless hero, Baldwin, first emperor of Constantinople. All the splendor of mediæval life was to be seen in Froissart's native city: on the walls of the Salle le Comte glittered—perhaps painted by his father—the arms and scutcheons beneath the banners and helmets of Luxembourg, Hainault, and Avesnes; the streets were crowded with knights and soldiers, priests, artisans, and merchants; the churches were rich with stained glass, delicate tracery, and precious carving; there were libraries full of richly illuminated manuscripts on which the boy could gaze with delight; every year there was the *fête* of the *puy d'Amour de Valenciennes,* at which he would hear the verses of the competing poets; there were festivals, masques, mummeries, and moralities. And, whatever there might be elsewhere, in this happy city there was only the pomp, and not the misery, of war; the fields without were tilled, and the harvests reaped, in security; the workman within plied his craft unmolested for good wage. But the eyes of the boy were turned upon the castle and not upon the town; it was the splendor of the knights which dazzled him, insomuch that he regarded and continued ever afterwards to regard a prince gallant in the field, glittering of apparel, lavish of largesse, as almost a god.

The moon, he says, rules the first four years of life; Mercury the next ten; Venus follows. He was fourteen when the last goddess appeared to him in person, as he tells us, after the manner of his time, and informed him that he was to love a lady, "belle, jone, et gente." Awaiting this happy event, he began to consider how best to earn his livelihood. They first placed him in some commercial position—impossible now to say of what kind—which he simply calls "la marchandise." This undoubtedly means some kind of buying and selling, not a handicraft at all. He very soon abandoned merchandise—"car vaut mieux science qu' argens" —and resolved on becoming a learned clerk. He then naturally began to make verses, like every other learned clerk. Quite as naturally, and still in the character of a learned clerk, he fulfilled the prophecy of Venus, and fell in love. He found one day a demoiselle reading a book of romances. He did not know who she was, but stealing gently towards her, he asked her what book she was reading. It was the romance of *Cleomades.* He remarks the singular beauty of her blue eyes and fair hair, while she reads a page or two, and then—one would almost suspect a reminiscence of Dante—

"Adont laissames nous le lire."

He was thus provided with that essential for soldier, knight, or poet, a mistress,—one for whom he could write verses. She was rich and he was poor; she was nobly born and he obscure; it was long before she would accept the devotion, even of the conventional kind, which Froissart offered her, and which would in no way interfere with the practical business of her life. And in this hopeless way, the passion of the young poet remaining the same, and the coldness of the lady being unaltered, the course of this passion ran on for some time. Nor was it until the day of Froissart's departure from his native town that she gave him an interview and spoke kindly to him, even promising, with tears in her eyes, that "Doulce Pensée" would assure him that she would have no joyous day until she should see him again.

He was eighteen years of age; he had learned all that he wanted to learn; he possessed the mechanical art of verse; he had read the slender stock of classical literature accessible; he longed to see the world. He must already have acquired some distinction, because, on setting out for the court of England, he was able to take with him letters of recommendation from the king of Bohemia and the count of Hainault to Queen Philippa, niece of the latter. He was well received by the queen, always ready to welcome her own countrymen; he wrote ballades and virelays for her and her ladies. But after a year he began to pine for another sight of "la très douce, simple, et quoie," whom he loved loyally. Good Queen Philippa, perceiving his altered looks and guessing the cause, made him confess that he was in love and longed to see his mistress. She gave him his *congé* on the condition that he was to return. It is clear that the young clerk had already learned to ingratiate himself with princes.

The conclusion of his single love adventure is simply and unaffectedly told in his *Trettie de l'Espinette Amoureuse.* It was a passion conducted on the well-known lines of conventional love; the pair exchanged violets and roses, the lady accepted ballads; Froissart became either openly or in secret her recognized lover, a mere title of honor, which conferred distinction on her who bestowed it, as well as upon him who received it. But the progress of the amour was rudely interrupted by the arts of "Malebouche" or Calumny. The story, whatever it was, that Malebouche whispered in the ear of the lady, led to a complete rupture. The *damoiselle* not only scornfully refused to speak to her lover or acknowledge him, but even seized him by the hair and pulled out a handful. Nor would she ever be reconciled to him again. Years afterwards, when Froissart writes the story of his one love passage, he shows that he still takes delight in the remembrance of her, loves to draw her portrait, and lingers with fondness over the thought of what she once was to him.

Perhaps to get healed of his sorrow, Froissart began those wanderings in which the best part of his life was to be consumed. He first visited Avignon, perhaps to ask for a benefice, perhaps as the bearer of a message from the bishop of Cambray to pope or cardinal. It was in the year 1360, and in the pontificate of Innocent VI. From the papal city he seems to have gone to Paris, perhaps charged with a diplomatic mission. In 1361 he returned to England after an absence of five years. He certainly interpreted his leave of absence in a liberal spirit, and it may have been with a view of averting the displeasure of his kind-hearted protector that he brought with him as a present a book of rhymed chronicles written by himself. He says that notwithstanding his youth, he took upon himself the task "à rimer et à dicter"—which can only mean to "turn into verse"—an account of the wars of his own time, which he carried over to England in a book "tout compilé,"—complete to date,—and presented to his noble mistress Philippa of Hainault, who joyfully and gently received it of him. Such a rhymed chronicle was no new thing. One Colin had already turned the battle of Crécy into verse. The queen made young Froissart one of her secretaries, and he began to serve her with "beaux dittiés et traités amoureux."

Froissart would probably have been content to go on living at ease in this congenial atmosphere of flattery, praise, and caresses, pouring out his virelays and chansons according to demand with facile monotony, but for the instigation of Queen Philippa, who seems to have suggested to him the propriety of travelling in order to get information for more rhymed chronicles. It was at her charges that Froissart made his first serious journey. He seems to have travelled a great part of the way alone, or accompanied only by his servants, for he was fain to beguile the journey by composing an imaginary conversation in verse between his horse and his hound. This may be found among his published poems, but it does not repay perusal. In Scotland he met with a favorable reception, not only from King David but from William of Douglas, and from the earls of Fife, Mar, March, and others. The souvenirs of this journey are found scattered about in the chronicles. He was evidently much impressed with the Scotch; he speaks of the valor of the Douglas, the Campbell, the Ramsay, and the Graham; he describes the hospitality and rude life of the Highlanders; he admires the great castles of Stirling and Roxburgh, and the famous abbey of Melrose. His travels in Scotland lasted for six months. Returning southwards he rode along the whole course of the Roman wall, a thing alone sufficient to show that he possessed the true spirit of an archæologist; he thought that Carlisle was Carlyon, and congratulated himself on having found King Arthur's capital; he calls Westmoreland, where the common people still spoke the ancient British tongue, North Wales; he rode down the banks of the Severn, and returned to London by way of Oxford—"l'escole d'Asque-Suffort."

In London Froissart entered into the service of King John of France as secretary, and grew daily more courtly, more in favor with princes and great ladies. He probably acquired at this period that art, in which he has probably never been surpassed, of making people tell him all they knew. No newspaper correspondent, no American interviewer, has ever equalled this mediæval collector of intelligence. From Queen Philippa, who confided to him the tender story of her youthful and lasting love for her great husband, down to the simplest knight—Froissart conversed with none beneath the rank of gentlemen—all united in telling this man what he wanted to know. He wanted to know everything: he liked the story of a battle from both sides and from many points of view; he wanted the details of every little cavalry skirmish, every capture of a castle, every gallant action and brave deed. And what was more remarkable, he forgot nothing. "I had," he says, "thanks to God, sense, memory, good remembrance of everything, and an intellect clear and keen to seize upon the acts which I could learn." But as yet he had not begun to write in prose.

At the age of twenty-nine, in 1366, Froissart once more left England. This time he repaired first to Brussels, whither were gathered together a great concourse of minstrels from all parts, from the courts of the kings of Denmark, Navarre, and Aragon, from those of the dukes of Lancaster, Bavaria, and Brunswick. Hither came all who could "rimer et dicter." What distinction Froissart gained is not stated; but he received a gift of money as appears from the accounts, "uni Fritsardo, dictori, qui est cum regina Angliæ, dicto die, VI. mottones."

After this congress of versifiers, he made his way to Brittany, where he heard from eye-witnesses and knights who had actually fought there details of the battles of Cocherel and Auray, the Great Day of the Thirty and the heroism of Jeanne de Montfort. Windsor Herald told him something about Auray, and a French knight, one Antoine de Beaujeu, gave him the details of Cocherel. From Brittany he went southwards to Nantes, La Rochelle, and Bordeaux, where he arrived a few days before the visit of Richard, afterwards second of that name. He accompanied the Black Prince to Dax, and hoped to go on with him into Spain, but was despatched to England on a mission. He next formed part of the expedition which escorted Lionel duke of Clarence to Milan, to marry the daughter of Galeazzo Visconti. Chaucer was also one of the prince's suite. At the wedding banquet Petrarch was a guest sitting among the princes.

From Milan Froissart, accepting gratefully a *cotte hardie* with 20 florins of gold, set out upon his travels in Italy. At Bologna, then in decadence, he met Peter, king of Cyprus, from whose follower and minister, Eustache de Conflans, he learned many interesting particulars of the king's exploits. He accompanied Peter as far as Venice, where he left him after receiving a gift of 40 ducats. With them and his *cotte hardie*, still lined we may hope with the 20 florins, Froissart betook himself to Rome. The city was then at its lowest point: the churches were roofless; there was no pope; there were no pilgrims; there was no splendor; and yet, says Froissart sadly,

"Ce furent jadis en Rome,
Li plus preu et li plus sage homme
Car par sens tons les arts passèrent."

It was at Rome that he learned the death of his friend King Peter of Cyprus, and worse still, an irreparable loss to him, that of the good Queen Philippa, of whom he writes, in grateful remembrance—

"Propices li soit Diex à l'âme!
J'en suis bien tenus de pryer,
Et ses larghesces escuyer,
Car elle me fist et créa."

Philippa dead, Froissart looked around for a new patron. Then he hastened back to his own country and presented himself, with a new book in French, to the duchess of Brabant, from whom he received the sum of 16 francs, given in the accounts as paid *uni Frissardo dictatori*. The use of the word *uni* does not imply any meanness of position, but is simply an equivalent to the modern French *sieur*. Froissart may also have found a patron in Yolande de Bar, grandmother of King René of Anjou. In any case he received a substantial gift from some one in the shape of the benefice of Lestines, a village some three or four miles from the town of Binche. Also, in addition to his cure, he got placed upon the duke of Brabant's pension list, and was entitled to a yearly grant of grain and wine, with some small sum in money.

It is clear, from Froissart's own account of himself, that he was by no means a man who would at the age of four or five and thirty be contented to sit down at ease to discharge the duties of parish priest, to say mass, to bury the dead, to marry the villagers, and to baptize the young. In those days, and in that country, it does not seem that other duties were expected. Preaching was not required, godliness of life, piety, good works, and the graces of a modern ecclesiastic were not looked for. Therefore, when Froissart complains to himself that the taverns of Lestines got 500 francs of his money, we need not at once set him down as either a bad priest, or exceptionally given to drink. The people of the place were greatly addicted to wine; the *taverniers de Lestines* proverbially sold good wine; the Flemings were proverbially of a joyous disposition—

"Ceux de Hainaut chantent à pleines gorges."

Froissart, the parish priest of courtly manners, no doubt drank with the rest, and listened if they sang his own, not the coarse country songs. Mostly he preferred the society of Gerard d'Obies, provost of Binche, and the little circle of knights within that town. Or, for it was not incumbent on him to be always in residence, he repaired to the court of Coudenberg, and became "moult frère et accointé" with the duke of Brabant. And then came Gui de Blois, one of King John's hostages in London in the old days. He had been fighting in Prussia with the Teutonic knights, and now, a little tired of war, proposed to settle down for a time in his castle of Beaumont. This prince was a member of the great house of Chatillon. He was count of Blois, of Soissons, and of Chimay. He had now, about the year 1374, an excellent reputation as a good captain. In him Froissart, who hastened to resume acquaintance, found a new patron. More than that, it was this Sire de Beaumont, in emulation of his grandfather, the patron of Jean le Bel, who advised Froissart seriously to take in hand the history of his own time. Froissart was then in his thirty-sixth year. For twenty years he had been rhyming, for eighteen he had been making verses for queens and ladies. Yet during all this time he had been accumulating in his retentive brain the materials for his future work.

He began by editing, so to speak, that is, by rewriting with additions the work of Jean le Bel; Gui de Blois, among others, supplied him with additional information. His own notes, taken from information obtained in his travels, gave him more details, and when in 1374 Gui married Marie de Namur, Froissart found in the bride's father, Robert de Namur, one who had himself largely shared in the events which he had to relate. He, for instance, is the authority for the story of the siege of Calais and the six burgesses. Provided with these materials, Froissart remained at Lestines, or at Beaumont, arranging and writing his chronicles. During this period, too, he composed his *Espinette Amoureux*, and the *Joli Buisson de jonesce*, and his romance of *Méliador*. He also became chaplain to the count of Blois, and obtained a canonry of Chimay. After this appointment we hear nothing more of Lestines, which he probably resigned.

In these quiet pursuits he passed twelve years, years of which we hear nothing, probably because there was nothing to tell. In 1386 his travels began again, when he accompanied Gui to his castle at Blois, in order to celebrate the marriage of his son Louis de Dunois with Marie de Berry. He wrote a *pastourelle* in honor of the event. Then he attached himself for a few days to the duke of Berry, from whom he learned certain particulars of current events, and then becoming aware of what promised to be the most mighty feat of arms of his time, he hastened to Sluys in order to be on the spot. At this port the French were collecting an enormous fleet, and making preparations of the greatest magnitude in order to repeat the invasion of William the Conqueror. They were tired of being invaded by the English, and wished to turn the tables. The talk was all of conquering the country and dividing it among the knights, as had been done by the Normans. It is not clear whether Froissart intended to go over with the invaders; but as his sympathies are ever with the side where he happens to be, he exhausts himself in admiration of this grand gathering of ships and men. "Any one," he says, "who had a fever would have been cured of his malady merely by going to look at the fleet." But the delays of the duke of Berry, and the arrival of bad weather, spoiled everything. There was no invasion of England. In Flanders Froissart met many knights who had fought at Rosebeque, and could tell him of the troubles which in a few years desolated that country, once so prosperous. He set himself to ascertain the history with as much accuracy as the comparison of various accounts by eye-witnesses and actors would allow. He stayed at Ghent, among those ruined merchants and mechanics, for whom, as one of the same class, he felt a sympathy never extended to English or French, perhaps quite as unfortunate; and he devotes no fewer than 300 chapters to the Flemish troubles, an amount out of all proportion to the comparative importance of the events. This portion of the chronicle was written at Valenciennes. During this residence in his birthplace his verses were crowned at the "puys d'amour" of Valenciennes and Tournay.

This part of his work finished, he considered what to do next. There was small chance of anything important happening in Picardy or Hainault, and he determined on making a journey to the south of France in order to learn something new. He was then fifty-one years of age, and being still, as he tells us, in his prime, "of an age, strength, and limbs able to bear fatigue," he set out as eager to see new places as when, 33 years before, he rode through Scotland and marvelled at the bravery of the Douglas. What he had, in addition to strength, good memory, and good spirits, was a manner singularly pleasing, and great personal force of character. This he does not tell us, but it comes out abundantly in his writings; and, which he does tell us, he took a singular delight in his book. "The more I work at it," he says, "the better am I pleased with it."

On this occasion he rode first to Blois; on the way he fell in with two knights who told him of the disasters of the English army in Spain; one of them also informed him of the splendid hospitalities and generosity of Gaston Phœbus, count of Foix, on hearing of which Froissart resolved to seek him out. He avoided the English provinces of Poitou and Guienne, and rode southwards through Berry, Auvergne, and Languedoc. Arrived at Foix he discovered that the count was at Orthez, whither he proceeded in company with a knight named Espaing de Lyon, who, Froissart found, had not only fought but could describe.

The account of those few days' ride with Espaing de Lyon is the most charming, the most graphic, and the most vivid chapter in the whole of Froissart. Every turn of the road brings with it the sight of a ruined castle, about which this knight of many memories has a tale or a reminiscence. The whole country teems with fighting stories. Froissart never tires of listening nor the good knight of telling. "Sainte Marie!" cries Froissart in mere rapture. "How pleasant are your tales, and how much do they profit me while you relate them! And you shall not lose your trouble, for they shall all be set down in memory and remembrance in the history which I am writing." Arrived at length at Orthez, Froissart lost no time in presenting his credentials to the count of Foix. Gaston Phœbus was at this time fifty-nine years of age. His wife, from whom he was separated, was that princess, sister of Charles of Navarre, with whom Guillaume de Machault carried on his innocent and poetical amour. The story of the miserable death of his son is well known, and may be read in Froissart. But that was already a tale of the past, and the state which the count kept up was that of a monarch. To such a prince such a visitor as Froissart would be in every way welcome. Mindful, no doubt, of those paid clerks who were always writing verses, Froissart introduced himself as a chronicler. He could, of course, rhyme, and in proof he brought with him his romance of *Méliador;* but he did not present himself as a wandering poet. The count received him graciously, speedily discovered the good qualities of his guest, and often invited him to read his *Méliador* aloud in the evening, during which time, says Froissart, "nobody dared to say a word, because he wished me to be heard, such great delight did he take in listening." Very soon Froissart, from reader of a romance, became *raconteur* of the things he had seen and heard; the next step was that the count himself began to talk of affairs, so that the note-book was again in requisition. There was a good deal, too, to be learned of people about the court. One knight recently returned from the East told about the Genoese occupation of Famagosta; two more had been in the fray of Otterbourne; others had been in the Spanish wars.

Leaving Gaston at length, Froissart assisted at the wedding of the old duke of Berry with the youthful Jeanne de Bourbon, and was present at the grand reception given to Isabeau of Bavaria by the Parisians. He then returned to Valenciennes, and sat down to write his fourth book. A journey undertaken at this time is characteristic of the thorough and conscientious spirit in which he composed his work; it illustrates also his restless and curious spirit. While engaged in the events of the year 1385 he became aware that his notes taken at Orthez and elsewhere on the affairs of Castile and Portugal were wanting in completeness. He left Valenciennes and hastened to Bruges, where, he felt certain, he should find some one who would help him. There was, in fact, at this great commercial centre, a colony of Portuguese. From them he learned that a certain Portuguese knight, Dom Juan Fernand Pacheco, was at the moment in Middelburg on the point of starting for Prussia. He instantly embarked at Sluys, reached Middelburg in time to catch this knight, introduced himself, and conversed with him uninterruptedly for the space of six days, getting his information on the promise of due acknowledgment. During the next two years we learn little of his movements. He seems, however, to have had trouble with his seigneur Gui de Blois, and even to have resigned his chaplaincy. Froissart is tender with Gui's reputation, mindful of past favors, and remembering how great a lord he is. Yet the truth is clear that in his declining years the once gallant Gui de Blois became a glutton and a drunkard, and allowed his affairs to fall into the greatest disorder. So much was he crippled with debt that he was obliged to sell his castle and county of Blois to the king of France. Froissart lays all the blame on evil counsellors. "He was my lord and master," he says simply, "an honorable lord and of great reputation; but he trusted too easily in those who looked for neither his welfare nor his honor." Although canon of Chimay and perhaps curé of Lestines as well, it would seem as if Froissart was not able to live without a patron. He next calls Robert de Namur his seigneur, and dedicates to him, in a general introduction, the whole of his chronicles. We then find him at Abbeville, trying to learn all about the negotiations pending between Charles VI. and the English. He was unsuccessful, either because he could not get at those who knew what was going on, or because the secret was too well kept. He next made his last visit to England, where, after forty years' absence, he naturally found no one who remembered him. Here he gave King Richard a copy of his "traités amoureux," and got favor at court. He stayed in England some months, seeking information on all points from his friends Henry Chrystead and Richard Stury, from the dukes of York and Gloucester, and from Robert the Hermit.

On his return to France, he found preparations going on for that unlucky crusade, the end of which he describes in his *Chronicle.* It was headed by the count of Nevers. After him floated many a banner of knights, descendants of the crusaders, who bore the proud titles of duke of Athens, duke of Thebes, sire de Sidon, sire de Jericho. They were going to invade the sultan's empire by way of Hungary; they were going to march south; they would reconquer the holy places. And presently we read how it all came to nothing, and how the slaughtered knights lay dead outside the city of Nikopoli. In almost the concluding words of the *Chronicle* the murder of Richard II. of England is described. His death ends the long and crowded *Chronicle,* though the pen of the writer struggles through a few more unfinished sentences.

The rest is vague tradition. He is said to have died at Chimay; it is further said that he died in poverty so great that his relations could not even afford to carve his name upon the headstone of his tomb; not one of his friends, not even Eustache Deschamps, writes a line of regret in remembrance; the greatest historian of his age had a reputation so limited that his death was no more regarded than that of any common monk or obscure priest. We would willingly place the date of his death where his *Chronicle* stops, in the year 1400; but tradition assigns the date of 1410.

What date more fitting than the close of the century for one who has made that century illustrious for ever?

Among his friends were Guillaume de Machault, Eustache Deschamps, the most vigorous poet of this age of decadence, and Cuvelier, a follower of Bertrand du Guesclin. These alliances are certain. It is probable that he knew Chaucer, with whom Deschamps maintained a poetical correspondence; there is nothing to show that he ever made the acquaintance of Christine de Pisan. Froissart was more proud of his poetry than his prose. Posterity has reversed this opinion, and though a selection of his verse has been published, it would be difficult to find an admirer, or even a reader, of his poems. The selection published by Buchon in 1829 consists of the *Dit dou Florin*, half of which is a description of the power of money; the *Débat dou Cheval et dou Levrier*, written during his journey in Scotland; the *Dittie de la Flour de la Margherite; a Dittie d'Amour* called *L'Orloge Amoureus*, in which he compares himself, the imaginary lover, with a clock; the *Espinette Amoureuse*, which contains a sketch of his early life, freely and pleasantly drawn, accompanied by rondeaux and virelays; the *Buisson de Jonesce*, in which he returns to the recollections of his own youth; and various smaller pieces. The verses are monotonous; the thoughts are not without poetical grace, but they are expressed at tedious length. It would be, however, absurd to expect in Froissart the vigor and verve possessed by none of his predecessors. The time was gone when Marie de France, Rutebœuf, and Thibaut de Champagne made the 13th century language a medium for verse of which any literature might be proud. Briefly, Froissart's poetry, unless the unpublished portion be better than that before us, is monotonous and mechanical. The chief merit it possesses is in simplicity of diction. This not infrequently produces a pleasing effect.

As for the character of his *Chronicle*, little need be said. There has never been any difference of opinion on the distinctive merits of this great work. It presents a vivid and faithful drawing of the things done in the 14th century. No more graphic account exists of any age. No historian has drawn so many and such faithful portraits. They are, it is true, portraits of men as they seemed to the writer, not of men as they were. Froissart was uncritical; he accepted princes by their appearance. Who, for instance, would recognize in his portrait of Gaston Phœbus de Foix the cruel voluptuary, stained with the blood of his own son, which we know him to have been? Froissart, again, had no sense of historical responsibility; he was no judge to inquire into motives and condemn actions; he was simply a chronicler. He has been accused by French authors of lacking patriotism. Yet it must be remembered that he was neither a Frenchman nor an Englishman, but a Fleming. He has been accused of insensibility to suffering. Indignation against oppression was not, however, common in the 14th century; why demand of Froissart a quality which is rare enough even in our own time? Yet there are moments when, as in describing the massacre of Limoges, he speaks with tears in his voice.

Let him be judged by his own aims. "Before I commence this book," he says, "I pray the Saviour of all the world, who created everything out of nothing, that He will also create and put in me sense and understanding of so much worth, that this book, which I have begun, I may continue and persevere in, so that all those who shall read, see, and hear it may find in it delight and pleasure." To give delight and pleasure, then, was his sole design.

As regards his personal character, Froissart depicts it himself for us. Such as he was in youth, he tells us, so he remained in more advanced life; rejoicing mightily in dances and carols, in hearing minstrels and poems; inclined to love all those who love dogs and hawks; pricking up his ears at the uncorking of bottles,—"Car au voire prens grand plaisir;" pleased with good cheer, gorgeous apparel, and joyous society, but no commonplace reveller or greedy voluptuary,—everything in Froissart was ruled by the good manners which he set before all else; and always eager to listen to tales of war and battle. As we have said above, he shows, not only by his success at courts, but also by the whole tone of his writings, that he possessed a singularly winning manner and strong personal character. He lived wholly in the present, and had no thought of the coming changes. Born when chivalrous ideas were most widely spread, but the spirit of chivalry itself, as inculcated by the best writers, in its decadence, he is penetrated with the sense of knightly honor, and ascribes to all his heroes alike those qualities which only the ideal knight possessed.

The first edition of Froissart was published in Paris. It bears no date; the next editions are those of the years 1505, 1514, 1518, and 1520. The best and most complete edition is that of Buchon, 1824, which is a continuation of one commenced by Dacier. An abridgment was made in Latin, by Belleforest, and published in 1672. An English translation was made by Bourchier, Lord Berners, and published in London, 1525. The translation now in use is that made by Thomas Johnes, and originally published in 1802–1805. (W. BE.)

FROME, a parliamentary borough and market town of Somersetshire, is situated on the small river Frome, an affluent of the Avon, 11 miles S. of Bath. It was formerly called Frome Selwood, from its situation on the borders of the extensive forest of Selwood. The river is crossed at Frome by a stone bridge of five arches. The town is irregularly built on an acclivity, and the older streets, with the exception of the principal one, are somewhat narrow and irregular. The parish church is an elegant edifice in the later Gothic style, with a tower and a fine octagonal spire 120 feet in height, and the church of St. Mary's, a fine structure in the First Pointed style, was erected in 1864. The other public buildings of importance are the market-house, and the museum. Among the educational and charitable institutions are the free grammar school, founded in the time of Edward VI., the national school, the asylum for the education and maintenance of 25 poor girls, the blue-coat school, and the almshouses for old men and women. Frome also possesses a literary institute, a mechanics' institute, and a school of art. The inhabitants are chiefly employed in the manufacture of broadcloth and other fine woollens, but there are also foundries, wire-card manufactories, and edge-tool works, and the town has been long noted for its ale. The vicinity is fertile and picturesque, and is ornamented with numerous fine mansions. Frome returns a member to parliament. The population in 1871 was 9753.

FROMENTIN, EUGÈNE (1820–1876), French painter, was born at La Rochelle in December, 1820. After leaving school he studied for some years under Louis Cabat, the landscape painter. Fromentin was one of the earliest pictorial interpreters of Algeria, having been able, while quite young, to visit the land and people that suggested the subjects of most of his works, and to store his memory as well as his portfolio with the picturesque and characteristic details of North African life. In 1849 he obtained a medal of the second class. In 1852 he paid a second visit to Algeria, accompanying an archæological mission, and then completed that minute study of the scenery of the country and of the habits of its people which enabled him to give to his after work the realistic accuracy that comes from intimate knowledge. In a certain sense his works are not more artistic results than contributions to ethnological science. His first great success was produced at the Salon of 1847, by the Gorges de la Chiffa. Among his more important works are—La Place de la Brèche à Constantine, 1849; Enterrement Maure, 1853; Bateleurs Nègres and Audience chez un Chalife, 1859; Berger Kabyle and Courriers Arabes, 1861; Bivouac Arabe, Chasse au Faucon, Fauconnier Arabe (now at the Luxembourg), 1863; Chasse au Heron, 1865; Voleurs de Nuit, 1867; Centaurs and Arabes attaqués par une Lionne, 1868; Halte de Muletiers, 1869; Le Nil and Un Souvenir d'Esneh, 1875. Fromentin was much influenced in style by Eugène Delacroix. His works are distinguished by striking composition, great dexterity of handling, and brilliancy of color. In them is given with great truth and refinement the unconscious grandeur of barbarian and animal attitudes and gestures. His later works, however, show signs of an exhausted vein, and of an exhausted spirit, accompanied or caused by physical enfeeblement. But it must be observed that Fromentin's paintings show only one side of a genius that was perhaps even more felicitously expressed in literature, though of course with less profusion. "Dominique," first published in the *Revue des Deux Mondes* in 1862, and dedicated to George Sand, is remarkable among the fictions of the century for delicate and imaginative observation and for emotional earnestness. Fromentin's other literary works are—*Visites Artistiques*, 1852; *Simples Pèlerinages*, 1856; *Un Été dans le Sahara*, 1857; *Une Année dans le Sahel*, 1858; and *Les Maîtres d'autrefois*, 1876. In 1876 he was an unsuccessful candidate for the Academy. He died suddenly at La Rochelle on the 27th August, 1876.

FRONDE, War of the (1648–1652). See France (p. 504) and Condé.

FRONTINUS, Sextus Julius, a Roman soldier, and the author of some interesting works, was born of a patrician family at Rome about 40 A.D. Nothing is known of his early life or history, till we find him acting as *prætor urbanus* under Vespasian, in 70, an office from which he soon retired to make way for Domitian. Five years later he was sent into Britain to succeed Petilius Cerealis as governor of that island. He subdued the Silures, and held the other native tribes in check till 78, when he was superseded by Agricola. In 97 he was appointed *curator aquarum* at Rome, an office which was never conferred except upon persons of very high standing. He was also a member of the college of augurs, retaining the dignity till his death, which appears to have happened about 103. The later years of his life were spent in studious retirement on the shores of Campania. Many works have been attributed to Frontinus, of which only two that are undoubtedly his are now extant. The first of these is a treatise on tactics entitled *Strategematicon Libri IV.*, and the second is entitled *De Aquis Urbis Romæ Libri II.* The latter conveys in a clear and terse style much valuable information on the manner in which ancient Rome was supplied with water, and on other matters of importance in the history of architecture. A large number of interpolations have been inserted into the *Strategematicon* by various writers. The two works have been translated into most of the languages of Europe.

The best editions of the *Strategematicon* are those of Oudendorp, Leyden, 1731, and Schwebel, Leipsic, 1772. The best editions of the *De Aquis* are those of Polenus, Pavia, 1722, and G. C. Adler, Altona, 1792.

FRONTO, Marcus Cornelius, a Roman grammarian, rhetorician, and advoçate, was born of an Italian family at Cirta in Numidia, a Libyan of the Libyans, as he calls himself, *Λίβυς τῶν Λιβύων*. The date of his birth is unknown, but as he was quæstor in 138, it must have been before 113, and not improbably between 100 and 110. He came to Rome in the reign of Hadrian, and soon gained such renown as an advocate and orator as to be reckoned inferior only to Cicero. Antoninus Pius, hearing of his fame, appointed him tutor to his adopted sons Marcus Aurelius and Lucius Verus; and Fronto, as appears from his surviving letters, completely gained the confidence and affection of both these pupils. He was proconsul of Asia for a few months in 143, and five years later he was offered the same post, but declined acceptance on the plea of bad health. He preferred to remain at Rome, where, by the practice of his profession, he amassed a very large fortune, which enabled him to purchase the famous gardens of Mæcenas, besides sumptuous villas in various parts of Italy. In his old age, when confined to his house by the gout, he used to receive the leading literary men, who flocked to hear his unrivalled conversation. This exhibited the same qualities as his more formal orations, which were so much admired that a school of rhetoricians called itself after his name, having for its object the restoration to the Latin language of its ancient purity and simplicity. Fronto died at an advanced age, but the exact date of his death is not known, and it is even uncertain whether he survived or predeceased the emperor Marcus Aurelius. Till 1815 the only work of Fronto's believed to exist was some disjointed fragments of his essay *De Differentia Vocabulorum*, and even this is more probably the production of a later grammarian who made use of Fronto's works. In that year, however, Angelo Mai discovered in the Ambrosian library at Milan a palimpsest manuscript, on which had been originally written some of Fronto's letters to his royal pupils. These he deciphered and published with notes, Milan, 1815. On his removal to Rome he discovered in the Vatican some additional sheets of the same palimpsest, which, like the first, contained letters of Fronto to Aurelius and Verus, with their replies. These palimpsests had originally belonged to the famous convent of St. Columba at Bobbio, and had been written over by the monks with the acts of the first council of Chalcedon. All these letters were published by Mai, at Rome, in 1823, under the title of *M. Cornelii Frontonis et M. Aurelii imperatoris epistolæ; L. Veri et Antonini Pii et Appiani epistolarum reliquiæ; Fragmenta Frontonis et scripta grammatica.* The discovery excited intense interest among the scholars of Europe, but a certain amount of disappointment was felt when the contents of the letters were examined. The characters of the two emperors, indeed, are displayed in a very favorable light, especially in the affection which they both seemed to have retained for their old master; but the subject-matter of most of the letters is of such ephemeral interest as to throw little additional light on Roman antiquity. Not only have 146 of the leaves of the manuscript been lost, but hardly half of the 194 still extant have been deciphered so as to furnish an intelligible context. A more careful examination of the palimpsest might possibly show good results.

A critical edition was published by Niebuhr, Buttmann, and Heindorf, Berlin, 1826; a French translation of Mai's edition of 1823, by Armand Cassan, Paris, 2 vols. 8vo, 1830; and an edition based on a new examination of the MSS. by Du Rieu, by Naber, Leipsic, 1867. Orelli published a selection of the letters or *Chrestomathia Frontoniana*, as an appendix to his edition of the *Dialogus de Oratoribus* of Tacitus. Critical observations on the remains have been published by L. Schopen (Bonn, 1830, 1841); Alan (Dublin, 1841); A. Philibert Soupé, *De Frontonis reliquiis*, Amiens, 1853; J. Mahly, in *Philologus*, xvii. and xix.; M. Haupt, *De emendatione librorum Frontonis*, Berlin, 1867; R. Ellis, in *Journal of Philology*, 1868; Eussner, in *Rheinisches Museum*, xxv.; Mommsen, in *Hermes*, 1874; Klussmann, *Emendationes Frontonianæ*, Göttingen, 1871; enlarged, Berlin, 1874.

FROSINONE, town of Italy, in the province of Rome, on the railway between Rome and Naples, about 62 miles from the former and 104 from the latter. It is situated in a rich vine-growing district, at the foot of a hill near the left bank of the Cosa, an affluent of the Sacco or *Trerus*. Though a place of considerable size and great antiquity, it contains very little of interest either for the classical or mediæval archæologist. Its principal buildings are the eight churches and a number of old convents. In the plain below there are some remains of an amphitheatre. Frosinone is easily identified with the ancient Frusino or Frusinum, a city of the Volscians which ultimately became a Roman municipium and received a colony of veterans. Previous to 1870 it was the head of a delegation of the papal states, and as such a place of some importance. The population in 1871 was 10,161.

FROST, William Edward (1810–1877), a painter of mythological and fanciful subjects, was born at Wandsworth, near London, in September, 1810. He showed at an early age considerable talent for drawing, and his father placed him under as good instruction as was available in the neighborhood. About 1825 he was introduced to Etty, who advised that he should attend a celebrated drawing school in Bloomsbury Street. After several years' study there, and in the sculpture rooms at the British Museum, Frost was in 1829 admitted as a student in the schools of the Royal Academy, where he was noted for steady and careful application, and for success in competition. He won medals in all the schools, except the antique, in which he was beaten by Maclise. During those years, and indeed until the time when more imaginative work had brought, with fame, other means of subsistence, he maintained himself by portrait painting. He is said to have painted, about this time, over 300 portraits; but not one of them is now remembered as a work of any artistic value. In 1839 he obtained the gold medal of the Royal Academy for his picture of Prometheus bound by Force and Strength. At the cartoon exhibition at Westminster Hall in 1843 he was awarded a third-class prize of 100 pounds, for his cartoon of Una alarmed by Fauns and Satyrs. He exhibited at the Academy Christ crowned with Thorns (1843), Nymphs dancing (1844), Sabrina (1845), Diana and Actæon (1846). In 1846 he was elected Associate of the Royal Academy. His Nymph disarming Cupid was exhibited in 1847; Una and the Wood-Nymphs of the same year was bought by the Queen. This was the time of Frost's highest popularity. Influences affecting the art of the country at the time led to the decline of his reputation after 1850; and opinion on his work so changed in later years that it was perhaps by courtesy only that he obtained the dignity of full membership of the Royal Academy. His later pictures are simply repetitions of earlier motives. Among them may be named Euphrosyne (1848), Wood-Nymphs (1851), Chastity (1854), Il Penseroso (1855), The Graces (1856), Narcissus (1857), Zephyr with Aurora playing (1858), The Graces and Loves (1863), Hylas and the Nymphs (1867). After being for some years at the head of the list of associates, Frost was elected to full membership of the Royal Academy in December, 1871. This dignity, however, he soon resigned, and his name appears in the lists issued during the last years of his life among those of honorary retired Academicians. There is something very flimsy about the productions of this painter. In work after work is continued the same unvarying series of maidens and nymphs, having the same smiles, gestures, graces. There is in these paintings no spontaneity and little truth of feeling of any kind. Frost had no high power of design, though some of his smaller and apparently less important works are not without grace and charm. Technically, his paintings are, in a sense, very highly finished, but they are entirely without mastery. The writings of Ruskin and the rise of the pre-Raphaelites changed the regard in which such productions as those of Frost were held; and his career was practically at an end some years before his death. As a man he was highly esteemed by his friends for the gentleness and modesty of his disposition. He died on the 4th of June, 1877.

FROSTBITE. See MORTIFICATION.

FRUGONI, CARLO INNOCENZO (1692–1768), an Italian poet, was born at Genoa 21st November, 1692. In accordance with the custom of the family to which he belonged, being destined, as the youngest son, for the ecclesiastical profession, he was, at the age of fifteen, in opposition to his strong wishes, shut up in a convent; and although in the following year he was induced to pronounce monastic vows, his sentiments continued to remain completely at variance with the profession he had adopted. He, however, made so rapid progress in his studies that he soon acquired considerable reputation as an elegant writer both of Latin and Italian prose and verse; and from 1716 to 1724 he filled the chairs of rhetoric at Brescia, Rome, Genoa, Bologna, and Modena successively, attracting by his brilliant fluency a large number of students at each university. Through Cardinal Bentivoglio he was recommended to Antonio Farnese, duke of Parma, who appointed him his poet laureate; and he remained at the court of Parma until the death of Antonio, after which he returned to Genoa. Shortly afterwards, through the intercession of Bentivoglio, he obtained from the pope the remission of his monastic vows, and by eloquent representations he ultimately succeeded in recovering a portion of his paternal inheritance. After the peace of Aix-la-Chapelle, he returned to the court of Parma, and there devoted the later years of his life chiefly to poetical composition. He died 20th December, 1768. Frugoni holds a place in the first rank of the lyrical poets of his time, and his other compositions, which embrace almost every form of poetry, have in most cases considerable merit, and are generally characterized by harmony of versification, elegance of language, and appositeness and great variety of imagery.

His collected works were published at Parma in 10 vols. in 1799, and a more complete edition appeared at Lucca in the same year in 15 vols. A selection from his works was published at Brescia in 1782, in 4 vols.

FRUMENTIUS, an early Christian missionary and bishop who is recognized by the Abyssinian church as its apostle and founder, and usually bears in Abyssinian literature the title of Abba Salama or Father of Salvation. According to Rufinus, an ecclesiastical historian of the latter part of the 4th century, who gives Ædesius himself as his authority, a certain Tyrian philosopher, accompanied by his kinsmen Frumentius and Ædesius, set out on an expedition to "India," but was murdered by the natives of a coast town which he visited by the way. The two young men, on the contrary, were taken under royal protection, and ultimately became tutors of the heir apparent to the throne. On the succession of their pupil they returned home. Ædesius was made presbyter of Tyre, and Frumentius was consecrated bishop by Athanasius of Alexandria, and went back to propagate Christianity among the "Indians." This story is substantiated by the letters of Athanasius, who distinctly mentions the consecration of Frumentius, in 326, as bishop of Axum in Abyssinia, and gives some details of the history of his mission. The opinion of Thomas Wright (*Early Christianity in Arabia*, 1855), that the scene of the labors of Frumentius was not Abyssinia but southern Arabia, appears quite irreconcilable with the direct testimony of Athanasius, whatever support it may find in the vaguer notices of ecclesiastical historians.

See Nicephorus, ix. 18; Rufinus, x. 9; Theodoret, i. 23; Athanasius, *Epistola ad Constantinum*.

FRUYTIERS, PHILIP, a pupil of the Jesuits' college at Antwerp in 1627, entered the Antwerp guild of painters without a fee in 1631. He is described in the register of that institution as "illuminator, painter, and engraver." The current account of his life is "that he worked exclusively in water colors, yet was so remarkable in this branch of his art for arrangement, drawing, and especially for force and clearness of color, as to excite the admiration of Rubens, whom he portrayed with all his family." The truth is that he was an artist of the most versatile talents, as may be judged from the fact that in 1646 he executed an Assumption with figures of life size, and four smaller pictures in oil, for the church of St. Jacques at Antwerp, for which he received the considerable sum of 1150 florins. Unhappily, no undoubted production of his hand has been preserved, and hence we are at a loss surely to gauge his acquirements. All that we can point to with certainty is a series of etched plates, chiefly portraits, which are acknowledged to have been powerfully and skilfully handled. If, however, we search the portfolios of art collections on the Continent, we sometimes stumble upon miniatures on vellum, drawn with great talent, and colored with extraordinary brilliancy. In form they quite recall the works of Rubens, and these, it may be, are the work of Philip Fruytiers, who died in 1666, and was buried on the 21st of June in the church of the Récollets at Antwerp.

FRY, or GURNEY, ELIZABETH (1780–1845), an eminent philanthropist and, after Howard, the chief promoter of prison reform in Europe, was born in Norwich on the 21st of May, 1780. Her father, John Gurney, afterwards of Earlham Hall, a wealthy merchant and banker, represented an old family which for some generations had belonged to the Society of Friends; and her mother, Catharine Bell, was a great-granddaughter of Robert Barclay, the friend and companion of George Fox. Elizabeth was the third daughter in a large family, which included Joseph John Gurney, whose name is intimately associated with those of Buxton, Wilberforce, and other promoters of the anti-slavery cause. While still a girl she gave many indications of the benevolence of disposition, clearness and independence of judgment, and strength of purpose, for which she was afterwards so distinguished; but it was not until after she had entered her eighteenth year that her religion assumed a decided character, and that she was induced, under the preaching of the American Quaker, William Savery, to become an earnest and enthusiastic though never fanatical "Friend." In August, 1800, she became the wife of Joseph Fry, a London merchant, and had her home for some years in St. Mildred's Court, City, and afterwards at Plashet House, Essex. Amid increasing family cares she was unwearied in her attention to the poor and the neglected of her neighborhood; and in 1811 she was acknowledged by her co-religionists as a "minister," an honor and responsibility for which she was undoubtedly qualified, not only by vigor of intelligence and warmth of heart, but also by an altogether unusual faculty of clear, fluent, and persuasive speech. Although she had made several visits to Newgate prison as early as February, 1813, it was not until nearly four years afterwards, that the great public work of her life may be said to have begun. The "Association for the Improvement of the Female Prisoners in Newgate," was formed in April, 1817. Its aim was the much-needed establishment of some of what are now regarded as the first principles of prison-discipline, such as entire separation of the sexes, classification of criminals, female supervision for the women, and adequate provision for their religious and secular instruction, as also for their useful employment. The ameliorations effected by this association, and largely by the personal exertions of Mrs. Fry, soon became obvious, and led to a rapid extension of similar methods to other places. In 1818 she, along with her brother, visited the prisons of Scotland and the north of England; and the publication (1819) of the notes of this tour, as also the cordial recognition of the value of her work by the House of Commons' committee on the prisons of the metropolis, led to a great increase of her correspondence, which now extended to Italy, Denmark, and Russia, as well as to all parts of the United Kingdom. Through a visit to Ireland, which she made in 1827, she was led to direct her attention to other houses of detention besides prisons; and her observations resulted in many important improvements in the British hospital system, and in the treatment of the insane. In 1838 she visited France, and besides conferring with many of the leading prison officials, she personally visited most of the houses of detention in Paris, as well as in Rouen, Caen, and some other places. In the following year she obtained an official permission to visit all the prisons in that country; and her tour, which extended from Boulogne and Abbeville to Toulouse and Marseilles, resulted in a report which was presented to the minister of the interior and the prefect of police. Before returning to England she had included Geneva, Zurich, Stuttgart, and Frankfort in her inspection. The summer of 1840 found her travelling through Belgium, Holland, and Prussia on the same mission; and in 1841 she also visited Copenhagen. In 1842, through failing health, Mrs. Fry was compelled to forego her plans for a still more widely extended activity, but had the satisfaction of hearing from almost every quarter of Europe that the authorities were giving increased practical effect to her suggestions. In 1844 she was seized with a lingering illness of which she died on the 12th of October, 1845. She was survived by a numerous family, the youngest of whom was born in 1822. Two interesting volumes of *Memoirs, with Extracts from her Journals and Letters*, edited by two of her daughters, were published in 1847.

FUAD PASHA, Mehmed (1814–1869), a Turkish statesman and author, was born at Constantinople in 1814. His father, Izzet-Effendi Kitchegizadey, better known as Izzet-Mollah, was a man of wealth and position, and had a high reputation as a poet; but he fell into disgrace with the Turkish Government, and his estates were confiscated. Fuad being therefore compelled to adopt a profession chose that of medicine; and after studying from 1828 to 1832 at Galata-Serai, he was appointed in 1834 physician to the admiralty, and accompanied the expedition against Tripoli. On his return to Constantinople he quitted the medical service and entered the interpreters' office, with the view of qualifying himself for a diplomatic post. In 1840 he accompanied the Turkish embassy to London as first secretary, and in 1843 he was appointed to the office of second interpreter to the Turkish Government, and subsequently to that of director of the translation office. Shortly after he was sent to congratulate Isabella II. on her accession to the throne of Spain. In 1845 he was appointed chief interpreter to the Porte; and in 1848, as grand-referendary of the imperial divan, he was named Ottoman commissioner, to settle the revolutionary disputes in the principalities of Moldavia and Wallachia. On his return from a special mission to Russia he was named minister of the interior, and shortly afterwards minister of foreign affairs. In 1853 he published a pamphlet on the question of the holy sepulchres, which greatly irritated the czar of Russia, and led Prince Menschikoff to act in such a manner that Fuad Pasha felt compelled, from self respect, to tender his resignation to the Turkish Government. Shortly afterwards war was declared between Russia and Turkey, and he was appointed commissioner at the headquarters of Omar Pasha. In 1855 he resumed his duties of foreign minister, and he continued in that office till the close of the war. In 1857 he became president of the council of tanzimat, in 1860 was appointed commissioner to Syria to settle the disputes between the Druses and the Maronites; shortly after his return he was named grand vizier; and in 1863 he became war minister, and a little later returned to his old post of foreign minister. In 1867 he accompanied the sultan to England and France. He died at Nice, whither he had gone for the benefit of his health, February 12, 1869. Fuad Pasha was one of the first members of the Turkish Imperial Academy of Sciences and Belles-Lettres, founded in 1851. He is the author of a poem entitled *Alhambra*, written after his sojourn in Spain, and of a Turkish grammar. The suave and genial manners of Fuad Pasha, and his diplomatic talents, stood Turkey in good stead in connection with the Crimean war and the various negotiations in reference to Turkey's relation to her Christian subjects, and helped to inspire a faith in her capacity for reforms, which later events have shown to have been largely misplaced. He endeavored to secure to his country the material advantages to be derived from the adoption of European improvements, but his measures effected no lasting reform in her administration; and by the adoption of a heedless system of credit, he largely increased her financial difficulties.

FUCHS, Johann Joseph. See Fux.

FUCHS, Johann Nepomuk von (1774–1856), an eminent chemist and mineralogist, was born at Mattenzell near Bremberg, in the neighborhood of the Baierischer Wald, May 15, 1774. Having acquired a knowledge of medicine at Vienna and Heidelberg, he in 1801 turned his attention to chemistry and mineralogy, which he studied at Freiberg, Berlin, and Paris. In 1807 he became professor of those sciences at the university of Landshut, and in 1823 conservator of the mineralogical collections at Munich, where, on the occasion of the removal thither of the university of Landshut, in 1826 he was appointed professor of mineralogy. In 1852 he retired from public life, and in 1854 he was raised to the nobility by the king of Bavaria. He died at Munich, March 5, 1856. Mineralogy and inorganic chemistry are indebted to Fuchs for numerous researches. He is more especially known for his discovery, in 1823, of a process for making a soluble glass, used for fixing fresco-colors, according to the method termed stereochromy. Among his works are—

Ueber den gegenseitigen Einfluss der Chemie und Mineralogie, Munich, 1824; *Die Naturgeschichte des Mineralreichs*, Kempten, 1842; *Ueber die Theorien der Erde*, Munich, 1844; *Bereitung, Eigenschaften, und Nutzanwendung des Wasserglasses*, Munich, 1857, of which French translations appeared in 1861 and 1864. His collective works were published at Munich in 1856.

FUCHS, Leonhard (1501–1566), a celebrated German physician, and one of the fathers of scientific botany, was born at Wembdingen in Bavaria, January 17, 1501. At the age of five years he lost his father, but under the care of his mother he early made great progress in learning. In his tenth year he was sent to school at Heilbronn, whence, a twelvemonth later, he was removed to Erfurt. After a year and a half he was admitted a student of the university of that town, which in 1521 conferred on him the degree of "baccalaureus." During the next 18 months he gave lessons in Latin and literature in his native town. He then repaired to the university of Anspach, where in 1521 he was created a master of arts. About the same time he espoused the doctrines of the Reformation. Having in 1524 received his diploma as doctor of medicine, he practised for two years in Munich. He became in 1526 professor of medicine at Ingolstadt, and in 1528 physician to the margrave of Anspach. In Anspach he was the means of saving the lives of many during the epidemic locally known as the "English sweating-sickness." By the duke of Würtemberg Fuchs was, in 1535, appointed to the professorship of medicine at the university of Tübingen, a post held by him till his death, which took place May 10, 1566. Among his numerous writings are the following:—

Errata recentiorum medicorum LX numero, adjectis eorum confutationibus, Haguenau, 1530, 4to; *Cornarius Furens* (an answer to a pamphlet by his medical opponent Cornarius, entitled *Vulpecula Excoriata*), Basel, 1533, 8vo, Vienna, 1545; *Paradoxorum medicinæ libri tres*, Basel, 1535, fol., etc.; *Tabulæ aliquot universæ medicinæ*, Basel, 1538, 4to; *De curandi ratione* (Tübingen, 1539)? 16mo, Leyd., 1548, 8vo, etc.; *Medendi Methodus*, Basel, 1541, fol., Lyons, 1541, and Paris, 1550, 8vo; *De historia stirpium commentarii insignes*, Basel, 1542, fol., a work illustrated with more than 500 excellent outline illustrations, including figures of the common foxglove, and of another species of the genus *Digitalis*, so named by him: it was several times re-edited, and was translated into most European languages; *De Sanandis totius humani corporis . . . malis*, Basel, 1542, 8vo, Paris, 1543, and Lyons, 1547, 16mo; *Nicolai Myrepsi Medicamentorum Opus, . . . e græco in latinum conversum*, 1549, fol.; *Institutiones Medicinæ*, Leyd. (2d ed.), 1560, 8vo; *De componendorum miscendorumque medicamentorum ratione*, Leyd., 1561, fol.; *De compositione medicamentorum*, Lyons, 1563, 12mo; *Opera didactica*, a revised collection of various of his already published works, Frankf., 1566 and 1604, fol.: the latter edition has prefixed to it a life of the author by Hitzler. Fuchs was an advocate of the Galenic school of medicine, and published several Latin translations of treatises by its founder and by Hippocrates, besides controversial tracts against the opinions of H. Thriverius, G. Ryffius, C. Egenolphus, G. Rufinus, G. Puteanus, and S. Montius.

FUCHSIA, so named by Plumier in honor of the botanist Leonhard Fuchs (*v. supra*), a genus of plants of the natural order *Onagraceæ*, characterized by entire, usually opposite leaves; pendent flowers; a funnel-shaped, brightly colored, quadripartite, deciduous calyx; 4 petals, alternating with the calycine segments; 8, rarely 10, exserted stamens, a long and filiform style, and inferior ovary; and fleshy, ovoid, many-seeded berries or fruit. All the members of the genus, with the exception of the New Zealand species, *F. excorticata*, *F. Kirkei* and *F. procumbens*, are natives of Central and South America,—occurring in the interior of forests, or in damp and shady mountainous situations. The various species differ not a little in size as well as in other characters; some, as *F. verrucosa*, being dwarf shrubs; others, as *F. arborescens* and *F. apetala*, attaining a height of 12 to 16 feet, and having stems several inches in diameter. Plumier, in his *Nova Plantarum Americanarum Genera*, p. 14, tab. 14, Paris, 1703, 4to, gave a description of a species of fuchsia, the first known, under the name of *Fuchsia triphylla, flore coccineo*, and a somewhat conventional outline figure of the same plant was published at Amsterdam, in 1757, by Burmann.[1] In the *Histoire des Plantes Médecinales* of the South American traveller Feuillée (p. 64, pl. XLVII.), written in 1709-11, and published by him with his *Journal*, Paris, 1725, the name *Thilco* is applied to a species of fuchsia from Chili, which is described, though not evidently so figured, as having a pentamerous calyx. The *F. coccinea* of Aiton (see Dr. J. D. Hooker, *J. Proc. Linnean Soc.*, Botany. vol. x. p. 458, 1867), the first species of fuchsia cultivated in England, where it was long confined to the greenhouse, was brought from South America by Captain Firth in 1788, and placed in Kew Gardens. Of this species Mr. Lee, a nurseryman at Hammersmith, soon afterwards obtained an example, and procured from it by means of cuttings several hundred plants, which he sold at a guinea each. In 1823, *F. macrostemon* and *F. gracilis*, and during the next two or three years several other species, were introduced into England; but it was not until about 1837, or soon after florists had acquired *F. fulgens*, that varieties of interest began to make their appearance. The numerous hybrid forms now existing are the result chiefly of the intercrossing of that or other long-flowered with globose-flowered plants. *F. Venus victrix*, raised by Mr. Gulliver, gardener to the Rev. S. Marriott of Horsemonden, Kent, and sold in 1822, to Messrs Cripps, was the earliest white-sepalled fuchsia, and is one of the best of its kind for hybridization. The first fuchsia with a white corolla was produced about 1853, by Mr. Storey. In some varieties the blossoms are variegated, and in others they are double. There appears to be very little limit to the number of forms to be obtained by careful cultivation and selection. To hybridize, the flower as soon as it opens is emasculated, and it is then fertilized with pollen from some different flower. As seed in the high-bred varieties of fuchsia is produced in but small quantity, it is worth, if it will germinate, at least 50 guineas an ounce (see H. Cannel, *Gardener's Mag.*, 1875, p. 251). To procure the seed, which when good is firm and plump, the ripe pods are sun-dried for a few days, and then crushed between the finger and thumb; the seed is next cleansed in water from the surrounding pulp, dried in saucers, and wrapped in paper for use. It is sown about February or March, in light, rich, well-drained mould, and is thinly covered with sandy soil, and watered. A temperature of 70°–75° Fahr. has been found suitable for raising. The seedlings are pricked off into shallow pots or pans, and when 3 inches in height are transferred to 3-inch pots, and are then treated the same as plants from cuttings (*v. inf.*). Fuchsias may be grafted as readily as camellias, preferably by the splice or whip method, the apex of a young shoot being employed as a scion; but the easiest and most usual method of propagation is by cuttings. As one of the most expeditious ways of procuring these, Loudon recommends to put plants in heat in January, and to take their shoots when three inches in length. For summer flowering in England they are best made about the end of August, and should be selected from the shortest-jointed young wood. Coarse brown sand intermixed with a little leaf-mould, with a surface-layer of silver-sand, affords them a good soil for striking. In from two to three weeks they may be put into 3-inch pots containing a compost of equal parts of rich loam, silver-sand, and leaf-mould. They are subsequently moved from the frame or bed, first to a warm and shady, and then to a more airy part of the greenhouse. In January a little artificial heat may be given, to be gradually increased as the days lengthen. The side-shoots are generally pruned when they have made three or four joints, and for bushy plants the leader is stopped soon after the first potting. Care is taken to keep the plants as near the glass as possible, and shaded from bright sunshine, also to provide them plentifully with water, except at the time of shifting, when the roots should be tolerably dry. For the second potting a suitable soil is a mixture of well-rotted cow-dung or old hotbed mould with leaf mould and sandy peat, and to promote drainage a little peat-moss may be placed immediately over the crocks in the lower part of the pot. Weak liquid manure greatly promotes the advance of the plants, and should be regularly supplied twice or thrice a week during the flowering season. After this, water is gradually withheld from them, and they may be placed in the open air to ripen their wood. The common garden fuchsia, *F. fulgens*, stands the winter in England if cut down and covered with 4–6 inches of dry ashes (Smee), and many other species may be grown in the open air if afforded a little protection from frosts. *F. discolor*, a native of the Falkland Islands, is a particularly hardy species (see *Trans. Hort. Soc. Lond.*, 2d ser., ii. p. 284). The nectar of fuchsia flowers has been shown by Mr. A. S. Wilson (*Rep. Brit. Assoc.*, 1878) to contain nearly 78 per cent. of cane sugar, the remainder being fruit sugar. The berries of some fuchsias are subacid or sweet, and edible. From certain species a dye is obtainable. The so-called "native fuchsias" of Southern and Eastern Australia are plants of the genus *Correa*, and natural order *Rutaceæ*.

See J. C. Loudon, *Arboretum*, vol. ii. pp. 942–45; Félix Porcher, *Histoire et Culture du Fuchsia*, Paris, 1874; F. W. Burbidge, *The Propagation and Improvement of Cultivated Plants*, 1877; *The Floral World*, 1878, pp. 74–76, 253–54.

(F. H. B.)

FUEL. This term includes all substances that may be usefully employed for the production of heat by combustion with atmospheric air or oxygen. Any element or combination of elements susceptible of oxidation, *i. e.*, any substance electro-positive to oxygen, may under particular conditions be made to burn; but only those that ignite by a moderate preliminary heating, and burn with comparative rapidity, and, what is practically of equal importance, are obtainable in quantity and at a moderate price, come fairly within the category of fuels. Among elementary substances only hydrogen, sulphur, carbon, silicon, and phosphorus can be so classed, and of these the last two are only of special application. More important than the elements are, however, the carbohydrates, or compounds of carbon, hydrogen, and oxygen, which form the bulk of the natural fuels, wood, peat, and coal, as well as of their liquid and gaseous derivatives, coal gas, coal tar, pitch, oil, etc., which are possessed of great fuel value. Carbon in the elementary form has its nearest representatives in charcoal and coke.

In the determination of the value of fuel two principal factors are involved, namely, the calorific power, or the total amount of heat obtainable from the perfect combustion of its constituents, and the calorific intensity, or pyrometric effect which is the temperature attained by the gaseous products of the combustion. The first of these is constant for any particular composition, and does not vary with the method of combustion, the quantity of heat developed by the combustion of a unit of carbon or hydrogen being the same whether it be burnt with oxygen, air, or a metallic oxide. The calorific intensity, on the other hand, being inversely proportional to the volume of gases produced, it is obvious that if the combustion is effected with pure oxygen the resulting carbonic acid (in the case of carbon) may be very much hotter than when air is used, as the duty of heating up an additional quantity of nitrogen rather more than three times the weight of the oxygen is in the latter case imposed upon a similar weight of carbon.

Theoretically 1 unit of carbon combines with 2·67 units of oxygen to form 3·67 units of carbonic acid, whose specific heat is 0·216. The resulting maximum temperature of the gases produced therefore cannot exceed

$$\frac{8080}{3{\cdot}67\times0{\cdot}216}=10187°\text{ C.};$$

but when a similar weight of carbon is burnt with air, the gases are diluted with 8·88 units of nitrogen, whose specific heat is 0·244. The highest temperature possible in the products of combustion in this case does not exceed

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[1] *Plantarum Americanarum Fasciculus Sextus, Continens Plantas, quas olim Carolus Plumierius, Botanicorum Princeps, Detexit, Eruitque. J. Burmannus atque in Insulis Antillis ipse depinxit*, pp. 124, 125, tab. cxxxiii.

$$\frac{8080}{3{\cdot}67\times0{\cdot}216+8{\cdot}88\times0{\cdot}24}=2731^\circ\ \text{C.}$$

The calorific value of a fuel may be determined by direct experiment, either by complete combustion on the small scale in a calorimeter, or by practical experiment on a working scale, by ascertaining the effect of a weighed quantity in performing a particular kind of work, such as evaporating water in a steam boiler, the result being expressed in the number of pounds of water converted into steam per pound of fuel burnt. It may also be computed from an ultimate chemical analysis,—the carbon and so much of the hydrogen as remains disposable for burning, after deducting sufficient to form water with the oxygen present, being credited with the full heating power derivable from their complete oxidation, according to the results found for these elements by the calorimeter.

The pyrometric effect, on the other hand, cannot be either computed or determined experimentally with complete accuracy, partly because the total combustion of a quantity of fuel in a given time at one operation is practically impossible, but more particularly from the fact that dissociation of the gaseous compounds produced in burning takes place to a greater or less extent at temperatures far below those indicated as possible by calculation based upon comparisons of the weight of the products of combustion and their specific heat with the calorific value of the substance as found by experiment. According to Bunsen, Deville, Dewar, and others who have specially considered this subject, a temperature of about 3000° C. will be the maximum attainable from any fuel by any ordinary process of combustion. The calorific powers of the principal elementary substances susceptible of use as fuels are given in the following table; they are expressed in *calories* or heat units, signifying the weight of water raised, in temperature 1° C., by the combustion of one unit of the different substances, and the corresponding weight of water converted into steam from a temperature of 100° C.

		Heat Units.	Water evaporated.
Hydrogen....	Burnt to Water, H_2O..............	34,462	62·66
Carbon........	" Carbonic acid, CO_2.....	8,080	14·69
"	" Carbonic oxide, CO....	2,474	4·50
Silicon........	" Silicic acid, SiO_2........	7,830	14·24
Phosphorus..	" Phosphoric acid, P_2O_5.	5,747	10·45
Sulphur	" Sulphurous acid, SO_2.	2,140	4·09

The corresponding values for the principal carbon compounds are—

		Heat units.	Units of water evaporated.
Marsh gas, C_2H_4...	Burnt to carbonic acid, CO_2, and water, H_2O.	14,675	26·68
Olefiant gas, C_4H_4.		11,849	21·55
Crude petroleum..		10,190	18·53
Oil of Turpentine.		10,852	19·73
Wax		10,496	19·04
Ether		9,027	16·41
Tallow		9,000	16·37
Alcohol................		7,183	13·06
Methyl alcohol (wood spirit).....		5,307	9·65
Bisulphide of carbon, CS_2...........	Burnt to CO_2 and SO_2.........	3,400	6·18
Carbonic oxide.....	Burnt to CO_2.......................	2,403	4·37

The fuels of the highest calorific value are, therefore, those containing the largest amount of disposable hydrogen. Such substances are, however, only of special application as being either gases, volatile liquids, or easily fusible solids; they require special contrivances for their combustion in order to avoid an undue production of smoke, or the formation of vapors liable to become explosive when mixed with air. The ordinary solid vegetable and mineral fuels,—wood, peat, coal, etc.,—are, therefore, of more general interest economically considered.

Wood may be considered as having the following average composition when in the air-dried state:—carbon, 39·6; hydrogen, 4·8; oxygen, 34·8; ash, 1·0; water, 20 per cent. When it is freshly felled, the water may be from 18 to 50 per cent. Air-dried or even green wood ignites readily when a considerable surface is exposed to the kindling flame, but in large masses with regular or smooth surfaces it is often difficult to get it to burn. When previously torrefied or scorched by heating to about 200°, at which part incipient charring is set up, it is exceedingly inflammable. The ends of imperfectly charred boughs from the charcoal heaps in this condition are used in Paris and other large towns in France for kindling purposes, under the name of *fumerons*. The inflammability, however, varies with the density,—the so-called hard woods, oak, beech, and maple taking fire less readily than the softer, and more especially the coniferous varieties rich in resin. The calorific power of absolutely dry woods may as an average be taken at about 4000 units, and when air-dried, *i.e.*, containing 25 per cent. of water, at 2800 to 3000 units, and their evaporative value as 3·68 and 4·44 times their own weight respectively.

Wood being essentially a flaming fuel is admirably adapted for use with heat-receiving surfaces of large extent, such as locomotive and marine boilers, and is also very cleanly in use. The absence of all cohesion in the cinders or unburnt carbonized residua causes a large amount of ignited particles to be projected from the chimney, when a rapid draught is used, unless special spark-catchers of wire gauze or some analogous contrivance are used. When burnt in open fire places the volatile products given off in the apartment on the first heating have an acrid penetrating odor, which is, however, very generally considered to be agreeable. Owing to the large amount of water present, no very high temperatures can be obtained by the direct combustion of wood, and to produce these for metallurgical purposes it is necessary to convert it previously either into charcoal, or into inflammable gas in a so-called gazogene or gas-producer. See CHARCOAL and CARBON.

Peat includes a great number of substances of very unequal fuel value, the most recently formed spongy light brown kind approximating in composition to wood, while the dense pitchy brown compact substance, obtained from the bottom of bogs of ancient formation, may be compared with lignite, or even in some instances with coal. Unlike wood, however, it contains incombustible matter in variable but large quantity, from 5 to 15 per cent., or even more. Much of this, when the amount is large, is often due to sand mechanically intermixed; when air-dried, the proportion of water is from 8 to 20 per cent. When these constituents are deducted, the average composition may be stated to be —carbon, 52 to 66; hydrogen, 4·7 to 7·4; oxygen, 28 to 39; and nitrogen, 1·5 to 3 per cent. Average air-dried peat may be taken as having a calorific value of 3000–3500 units, and when freed from water by a heat of 100 degrees, and with a minimum of ash (4 to 5 per cent.), at about 5200 units, or from a quarter to one third more than that of an equal weight of wood. The lighter and more spongy varieties of peat when air-dried are exceedingly inflammable, firing at a temperature of 200° C.; the denser pulpy kinds ignite less readily when in the natural state, and often require a still higher temperature when prepared by pulping and compression or partial carbonization. Most kinds burn with a red smoky flame, developing a very strong odor, which, however, has its admirers in the same way that wood smoke has. This arises from the destructive distillation of imperfectly carbonized organic matter. The ash, like that of wood, is light and powdery, except when much sand is present, when it is of a denser character.

Peat is principally found in high latitudes, on exposed high table-lands and treeless areas in more temperate climates, and in the valleys of slow-flowing rivers,—as in Ireland, the west of Scotland, the table-land of Bavaria, the North-German plain, and parts of the valleys of the Somme, Oise, and a few other rivers in northern France. In the last-named country it is dredged from the bottom of ponds, and in the summer time moulded into bricks, which are dried by exposure to the sun. A principal objection to its use is its extreme bulk, which for equal evaporative effect is from 8 to 18 times that of coal. On the railways in Bavaria and Oldenburg, where peat is burned, the tenders, in order to have the necessary fuel capacity, are made of equal dimensions with the largest goods waggons, and the water reservoir is placed below the axles, nearly down to the level of the rails. Various methods have been proposed, and adopted more or less successfully, for the purpose of increasing the density of raw peat by compression, either with or without pulping; the latter process gives the heaviest products, but the improvement is scarcely sufficient to compensate for the cost.

Lignite or brown coal is of intermediate character between peat and coal proper. The best kinds are undistinguishable in quality from free-burning coals, and the lowest earthy kinds are not equal to average peat. When freshly raised, the proportion of water may be from 45 to 50 per cent. and even more, which is reduced from 28 to 20 per cent. by exposure to dry air. Most varieties, however, when fully dried, break up into powder, which considerably diminishes their utility as fuel, as they cannot be consolidated by coking. Lignite dust may, however, be compacted into serviceable blocks for burning, by pressure in machines similar to those used for brick-making, either in the wet state as raised from the mines, or when kiln-dried at 200° C. This method, adopted to a very large extent in Prussian Saxony, is noticed in Ure's *Dictionary*, vol. iv. p. 530, and described in detail in *Zeitschr. für Berg-, Hütten-, u. Salinen-wesen*, xxiv. p. 234. The calorific value, as far as it can be expressed by averages, varies between 3500 and 5000 units, and the evaporative factor from 2·16 when freshly raised to 5·84 for the best kinds of lignite when perfectly dried.

The manner of estimating the heating power of coal has already been considered (vol. vi., pp. 74, 75).

The heating effect of fuels obtained in practice is always considerably less than that indicated by theory, as the latter supposes complete combustion, a result which cannot be attained in the ordinary system of burning upon a grate of bars with spaces between them for the admission of air, as a certain portion of unconsumed particles when sufficiently reduced in size to pass through the grate bars fall through with the ashes, forming cinders which represent so much of the useful fuel lost, at any rate for the time. This proportion varies very considerably with the state of the fuel and its proportion of ash. A summary of the different observations upon this point made by Hartig, Playfair, Johnson, and Brix gives the total loss in ash and cinders observed in the coal trials of various countries as follows:—

American coals	5·0 to 18·5 per cent.
English "	2·9 " 27·7 "
Prussian "	1·5 " 11·6 "
Saxon "	7·4 " 63·4 "

In one of the latest researches upon the heating power and other properties of coal for naval use, carried out by the German Admiralty, the following results were obtained with coals from different localities:—

	Slag left in grate per cent.	Ashes in ash-pit per cent.	Soot in flues per cent.	Water evaporated by 1 ℔ of coal.
Westphalian gas coals	0·33–6·42	2·83– 6·53	0·32–0·46	6·60–7·45 ℔
Do. bituminous coals	0·98–9·10	1·97– 9·63	0·24–0·88	7·30–8·66
Do. dry coals	1·93–5·70	4·37–10·63	0·24–0·48	7·03–8·51
Silesian coals	0·92–1·30	3·15– 3·50	0·24–0·30	6·73–7·10
Welsh steam coals	1·20–4·07	4·07	0·32	8·41
Newcastle coals	1·92	2·57	0·35	7·28

The evaporative power in these experiments is referred to water at the freezing point, while in the results given in article COAL, vol. vi. p. 75, it is computed from the boiling point. The latter quantities therefore require to be reduced by about one-seventh to bring them into comparison.

In many cases, however, the evaporative factor found by practical experiment in a steam boiler is from a third to nearly a half less than that indicated by theory, the differences covering waste by imperfection of combustion and losses by radiation, etc., in the furnace and flues.

Of the other natural fuels the most important is so-called vegetable refuse, such as cotton stalks, brushwood, straw, and the woody residue of sugar cane after the extraction of the saccharine juice known as megasse or cane trash. These are extensively used in countries where wood and coal are scarce, usually for providing steam in the manufactures where they arise, *e. g.*, straw for threshing, cotton stalks for ploughing, irrigating, or working presses, and cane trash for boiling down sugar or driving the cane mill. According to Mr. J. Head (*Proc. Inst. of Civil Engineers*, vol. xlviii. p. 75), the evaporative values of 1 ℔ of these different articles when burnt in a tubular boiler are—coal, 8 ℔; dry peat, 4 ℔; dry wood, 3·58–3·52 ℔; cotton stalks or megasse, 3·2–2·7 ℔; straw, 2·46–2·30 ℔. In burning straw it is found most convenient to use a pair of toothed rollers, which pass it continuously into the fire box in a thin layer. Owing to the siliceous nature of the ash, it is also desirable to have a means of clearing the grate bars from slags and clinkers at short intervals, and to use a steam jet to clear the tubes from similar deposits.

The common fuel of India and Egypt is derived from the dung of camels and oxen, moulded into thin cakes, and dried in the sun. As might be imagined it has a very low heating power, and in burning gives off acrid ammoniacal smoke and vapor.

Somewhat similar to these are the tan cakes made from spent tanners' bark, which are used to some extent in eastern France and in Germany. They are made by moulding the spent bark into circular cakes, which are then slowly dried by exposure to the air. Their effect is about equivalent to 80 and 30 per. cent. of equal weights of wood and coal respectively. The same class of fuel made from exhausted dye-wood is considered to be equal to two-thirds of its weight of coal.

Liquid fuel in the form of natural petroleum, and the heavy or so-called dead or creosote oil obtained in coal-tar distilleries, have recently been used to some extent both for heating steam boilers and welding iron. In England the former cannot be used from its high price, apart from the danger caused by the irregular volatility of its constituents; the latter, however, is perfectly manageable when blown into a heated combustion chamber as a fine spray by means of steam jets, where it is immediately volatilized and takes fire. The heating power is very great, one ton of creosote oil being equal to 2 or 2½ tons of coal in raising steam.

Natural gases, consisting principally of light hydrocarbons, have at different times been used as fuel, but the examples of their application are necessarily rare. The most conspicuous example at the present time is afforded by the Iron City and Siberia Iron Works, near Pittsburg, in Pennsylvania, where puddling and welding furnaces, as well as steam boilers, are entirely fired by the gas from a well bored for oil, 1200 feet deep, which is brought to the works through a pipe several miles in length, and arrives with a pressure of two atmospheres. Ordinary coal gas, such as is used for illuminating, can also be applied for heating purposes, but it is, in spite of its very high calorific power, too expensive for general use. A cheaper material obtained by the distillation of lignite at a high temperature has been tried to some extent in Berlin. The average composition of this is—hydrogen 42·36; carbonic oxide, 40; marsh gas, 11·37; nitrogen, 3·17; carbonic acid, 2·01; and condensable hydrocarbons, 1·09 per cent. According to Ziurek, a thousand cubic feet of such gas corresponds in heating power to 30 or 33 ℔ of coal.

Sulphur, phosphorus, and silicon, the other principal combustible elements, are only of limited application as fuels. The first is used in the liquation of sulphur-bearing rocks. The ore is piled into large heaps, which are ignited at the bottom, a certain proportion, from one-fourth to one-third of the sulphur contents, being sacrificed, in order to raise the mass to a sufficient temperature to allow the remainder to melt, and run down to the collecting basin. Phosphorus, which is of value from its low igniting point, receives its only application in the manufacture of lucifer matches,—the heat generated by friction against a roughened surface being sufficient to start the flame, which is ultimately communicated to the dry wood, by means of a somewhat less inflammable substance, such as sulphur or paraffin. The high temperature produced by burning phosphorus is due to the product of combustion (phosphoric acid) being solid, and therefore there is less heat absorbed than would be the case with a gaseous product. The same effect is observed in a still more striking manner with silicon, which in the only special case of its application to the production of heat, namely, in the Bessemer process of steel-making, gives rise to an enormous increase of temperature in the metal, sufficient indeed to keep the softest iron melted. The absolute calorific value of silicon is rather less than that of carbon, but the product of combustion (silicic acid) being fixed at all furnace temperatures, the whole of the heat developed is available for heating the molten iron, instead of a considerable part being consumed in the work of volatilization, as is the case with carbonic acid. (H. B.)

FUENTE DE CANTOS, a town of Spain in the province of Badajoz, and midway between the cities of Badajoz and Seville. It has some trade in the produce of the surrounding district, which is fertile; and there are important copper mines in the vicinity. Almost its only manufacture is a coarse sort of frieze. Francisco Zurbaran, the painter, was born there in 1598. Population upwards of 6000.

FUENTE DEL MAESTRE, a town of Spain in the province of Badajoz, about 25 miles S.S.W. of Merida. Its manufactures are insignificant, but it has some trade in corn, wine, oil, garbanzos, and other produce of the broad and fertile plain on which it is situated. Population, 5869.

FUENTERRABIA, an ancient town and frontier fortress of Spain, in the province of Guipúzcoa and bishopric of Pamplona, 11 miles E.N.E. of San Sebastian, and 2 miles from Irun. It stands on the slope of a hill on the west bank of the Bidassoa, and near the point where its estuary begins. At one time it possessed considerable strategic importance, and it has frequently been taken and retaken in wars between France and Spain. The "dolorous rout" of Charlemagne, however, which has been associated by Milton with Fontarabia, is generally understood to have taken place not here but at Roncesvalles, which is nearly 40 miles distant. Unsuccessful attempts to seize Fuenterrabia were made by the French troops in 1476, and again in 1503. In a subsequent campaign (1521) these were more successful, but it was retaken in 1524. The prince of Condé sustained a severe repulse under its walls in 1638, and it was on this occasion that the town received from Philip IV. the rank of city (muy noble, muy leal, y muy valorosa ciudad). After a severe siege it surrendered to the duke of Berwick in the English war of 1719 (18th June); and in 1794 it again fell into the hands of the French, who so dismantled it that it has never since been reckoned by the Spaniards among their fortified places. It was by the ford opposite Fuenterrabia that the duke of Wellington, on the 8th of October, 1813, by "one of the most daring exploits of military genius," successfully forced a passage into France in the face of an opposing army commanded by Soult. Severe fighting also took place here during the Carlist war in 1837. The town is now considerably dilapidated and decayed. Its inhabitants are employed chiefly in salmon and other fisheries. Population, 772. See Palafox, *Sitio y Socorro de Fuente-rabia*, Madrid, 1639.

FUERO. The Castilian use of this Latin word (forum) in the sense of a right, privilege, or charter is most probably to be traced to the Roman conventus juridici, otherwise known as jurisdictiones, or fora, which in Pliny's time were already numerous in the Iberian peninsula. In each of these provincial fora the Roman magistrate, as is well known, was accustomed to pay all possible deference to the previously established common law of the district; and it was the privilege of every free subject to demand that he should be judged in accordance with the customs and usages of his proper forum. This was especially true in the case of the inhabitants of those towns which were in possession of the jus italicum. It is not, indeed, demonstrable, but there are many presumptions, besides some fragments of direct evidence, which make it more than probable, that the old administrative arrangements both of the provinces and of the towns, but especially of the latter, remained practically undisturbed at the period of the Gothic occupation of Spain.[1] The Theodosian Codex and the Breviarium Alaricianum alike seem to imply a continuance of the municipal system which had been established by the Romans; nor does the later Lex Visigothorum, though avowedly designed in some points to supersede the Roman law, appear to have contemplated any marked interference with the former fora, which were still to a large extent left to be regulated in the administration of justice by unwritten, immemorial, local custom. Little is known of the condition of the subject populations of the Peninsula during the Arab occupation; but we are informed that the Christians were, sometimes at least, judged according to their own laws in separate tribunals presided over by Christian judges;[2] and the mere fact of the preservation of the name alcalde, an official whose functions corresponded so closely to those of the judex or defensor civitatis, is fitted to suggest that the old municipal fora, if much impaired, were not even then in all cases wholly destroyed. At all events when the word forum[3] begins to appear for the first time in documents of the 10th century in the sense of a liberty or privilege, it is generally implied that the thing so named is nothing new. The earliest extant written fuero is probably that which was granted to the province and town of Leon by Alphonso V. in 1020. It emanated from the king in a general council of the kingdom of Leon and Castile, and consisted of two separate parts; in the first 19 chapters were contained a series of statutes which were to be valid for the kingdom at large, while the rest of the document was simply a municipal charter.[4] But in neither portion does it in any sense mark a new legislative departure, unless in so far as it marks the beginning of the era of written charters for towns. The "fuero general" does not profess to supersede the consuetudines antiquorum jurium or Chindaswint's codification of these in the Lex Visigothorum; the "fuero municipal" is really for the most part but a resuscitation of usages formerly established, a recognition and definition of liberties and privileges that had long before been conceded or taken for granted. The right of the burgesses to self-government and self-taxation is acknowledged and confirmed, they, on the other hand, being held bound to a constitutional obedience and subjection to the sovereign, particularly to the payment of definite imperial taxes, and the rendering of a certain amount of military service (as the ancient municipia had been). Almost contemporaneous with this fuero of Leon was that granted to Najera (Naxera) by Saucho el Mayor of Navarre (*ob.* 1035), and confirmed, in 1076, by Alphonso VI.[5] Traces of others of perhaps even an earlier date are occasionally to be met mith. In the fuero of Cardeña, for example, granted by Ferdinand I. in 1039, reference is made to a previous forum Burgense (Burgos), which, however, has not been preserved, if, indeed, it ever had been reduced to writing at all. The phraseology of that of Sepulveda (1076) in like manner points back to an indefinitely remote antiquity.[6] Among the later fueros of the 11th century, the most important are those of Jaca (1064) and of Logroño (1095). The former of these, which was distinguished by the unusual largeness of its concessions, and by the careful minuteness of its details, rapidly extended to many places in the neighborhood, while the latter charter was given also to Miranda by Alphonso VI., and was further extended in 1181 by Sancho el Sabio of Navarre to Vitoria, thus constituting one of the earliest written fora of the "Provincias Vascongadas." In the course of the 12th and 13th centuries the number of such documents increased very rapidly; that of Toledo especially, granted to the Mozarabic population in 1101, but greatly enlarged and extended by Alphonso VII. (1118) and succeeding sovereigns, was used as a basis for many other Castilian fueros. Latterly the word fuero came to be used in Castile in a wider sense than before, as meaning a general code of laws; thus about the time of Saint Ferdinand the old Lex Visigothorum, then translated for the first time into the vernacular, was called the Fuero Juzgo, a name which was soon retranslated into the barbarous Latin of the period as Forum Judicum;[7] and among the compilations of Alphonso the Learned in like manner were an *Espejo de Fueros* and also the *Fuero de las leyes*, better known perhaps as the *Fuero Real*. The famous code known as the *Ordenamiento Real de Alcalá*, or *Fuero Viego de Castilla*, dates from a still later period. As the power of the Spanish crown was gradually concentrated and consolidated, royal pragmaticas began to take the place of constitutional laws; the local fueros of the various districts slowly yielded before the superior force of imperialism; and only those of Navarre and the Basque provinces have had sufficient vitality to enable them to survive to comparatively modern times. While actually owning the lordship of the Castilian crown since about the middle of the 14th century, these provinces, until quite recently, rigidly insisted upon compliance with their consuetudinary law, and especially with that which provided that the señor, before assuming the government, should personally appear before the assembly and swear to maintain the ancient constitutions. Each of the provinces mentioned had distinct sets of fueros, codified at different periods, and varying considerably as to details; the main features, however, were the same in all. In the province of Biscay, the most democratic of the group, the management of public affairs was vested in the junta or assembly of popular representatives, chosen by household suffrage. Its functions included the collection of taxes, the protection and defence of the territory, and the nomination of all the officers of government except the corregidor. The inhabitants of the province were exempt from all imposts except the self-imposed ones of their own locality, and from all duties on imported merchandise. They claimed the privileges of Spanish nobility on merely proving their descent from pure Biscayan blood. They were not obliged to appear before any tribunal beyond the bounds of their own lordship, or to tolerate any royal intendant or comptroller within the province, or to allow any royal monopoly as in the rest of Spain, or have any royal establishment except the post-office, or admit royal troops within the territory, or furnish recruits for the royal army. They were privileged to defend their territory with their own means and their own blood, and, moreover, to visit with summary punishment every attempt to interfere with these their constitutional rights. These rights, after having been recognized by successive Spanish sovereigns from Ferdinand the Catholic to Ferdinand VII., were, at the death of the latter in 1833, set aside by the Government of Castaños. The result was a civil war, which terminated in a renewed acknowledgment of the fueros by Isabel II. (1839). The provisional Government of 1868 also promised to respect them, and similar pledges were given by the Governments which succeeded. In consequence, however, of the Carlist rising of 1873-76, the Basque fueros were finally extinguished in 1876. The history of the *Foraes* of the Portuguese towns, and of the *Fors du Béarn*, is precisely analogous to that of the Fueros of Castile.

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[1] The nature of the evidence may be gathered from Savigny, *Gesch. d. Röm. Rechts.* See especially i. pp. 154, 259 *seq.*

[2] Compare Lembke u. Schäfer, *Geschichte Spaniens*, i. 314; ii. 117.

[3] Or rather forus. See Ducange, *s. v.*

[4] Cap. xx. begins:—Constituimus etiam ut Legionensis civitas, quæ depopulata fuit a Sarracenis in diebus patris mei Veremundi regis, repopulatur *per hos foros subscriptos.*

[5] Mando et concedo et confirmo ut ista civitas cum sua plebe et cum omnibus suis pertinentiis sub tali lege et sub tali foro maneat per sæcula cuncta. Amen. Isti sunt fueros quæ habuerunt in Naxera in diebus Sanctii regis et Gartiani regis.

[6] Ego Aldefonsus rex et uxor mea Agnes confirmamus ad Septempublica suo foro quod habuit in tempore antiquo de avolo meo et in tempore comitum Ferrando Gonzalez et comite Garcia Ferdinandez et comite Domno Santio.

[7] This Latin is later even than that of Ferdinand, whose words are: "Statuo et mando quod Liber Judicum, quo ego misi Cordubam, translatetur in vulgarem et vocetur forum de Corduba . . . et quod per sæcula cuncta sit pro foro et nullus sit ausus istud forum aliter appellare nisi forum de Corduba, et jubeo et mando quod omnis morator et populator . . . veniet ad judicium et ad forum de Corduba."

Among the numerous works that more or less expressly deal with this subject, that of Marina (*Ensayo Historico-critico sobre la antigua Legislacion y principales Cuerpos Legales de los Reynos de Leon y Castilla*) still continues to hold a high place. Reference may also be made to Colmeiro's *Curso de Derecho Politico segun la historia de Leon y de Castilla* (Madrid, 1873); to Schäfer's *Geschichte von Spanien*, ii. 418-428, iii. 293 *seq.*; and to Hallam's *Middle Ages*, c. iv.

FUGGER, the name of a Swabian family which, by remarkable energy in industry and commerce, acquired enormous wealth, and rose to high rank in the state. The founder of the family was John Fugger, a respectable master-weaver at Graben, near Augsburg. His eldest son, John, associated trade in linen with weaving in Augsburg, of which he became a citizen by marriage in 1370. Here he rose to an honorable position, being one of the twelve councillors of the guild of weavers, and an assessor of the Fehmgericht, the much dreaded secret tribunal of Westphalia. He died in 1409, leaving a fortune of 3000 florins. His eldest son, by a second marriage, Andrew, was known as "the rich Fugger," and became the founder of a noble line, Fugger vom Reh, which died out in 1583. Jacob Fugger, the second son of John, was the first of the family who possessed a house in Augsburg, where he greatly extended the business he inherited, and was made head of the guild of weavers. After his death in 1469, his three sons, Ulrich, George, and Jacob, who were men of unusual resource and industry, added immensely to the riches he had left them. Ulrich devoted himself to trade, and his operations were so varied that even the works of Albert Dürer reached Italy by his means. Jacob worked the mines of Tyrol, and his profits were vast enough to enable him, without difficulty, to lend the archduke of Austria 150,000 florins, and to build (in Tyrol) the splendid castle of Fuggerau. The three brothers married ladies of noble families, and were themselves raised to noble rank by the emperor Maximilian, who, being always in need of money, was delighted to honor subjects whose power of aiding him was so extensive. In return for 70,000 gulden he mortgaged to them the county of Kirchberg and the lordship of Weissenhorn; and afterwards, in carrying on war with Venice, he received from them, at the request of Pope Julius II., a subsidy of 170,000 ducats. An evidence of the generous use to which they put their wealth still survives in the Fuggerei at Augsburg,—a collection of more than 100 small houses built by the brothers and let by them at low rents to poor tenants. Jacob and the two sons of Ulrich died without heirs, so that the possessions of the family descended to the sons of George. Of these the eldest, Marcus, became a priest, and died in 1511. His two brothers, Raimund and Antonius, then represented the house, and their names were soon well-known far beyond the limits of Germany, for they had commercial relations with nearly every part of the civilized world. They were vehement opponents of the Reformation, and freely spent money in support of the church. During the famous diet of Augsburg in 1530, Charles V. enjoyed the splendid hospitality of Antonius in his house in the Weinmarkt; and there is a story that the merchant astonished the emperor by lighting a fire of cinnamon with an imperial bond for money due to him. According to another anecdote, Charles remarked at a later time, when the treasury of the king of France was being shown to him, "There is a linen-weaver in Augsburg who could pay all that out of his own purse." Whether these things are true or not, the emperor was certainly impressed by the extraordinary resources of the two citizens. He not only made over to them the mortgaged properties of Kirchberg and Weissenhorn, but created them counts and invested them with princely privileges. In return for the help they gave him in his expedition against the pirates of Algiers in 1535, he conferred on them the right of issuing a gold and silver coinage of their own; and the right was repeatedly exercised. Their princely rank did not prevent them from continuing their mercantile career, and when Antonius died in 1560 he left six million gold crowns, besides a vast amount of property of various kinds in Europe, Asia, and America. He and his brother Raimund (who died in 1535) were the founders of two great lines which are still continued. The privileges conferred on the family by Charles V. were confirmed and increased by Ferdinand II.; and since that time, although no member either of the Raimund or the Antonius line has risen to the highest distinction in any department, many of them have done honorable service to the state, and have been famous for their liberality. The fortunes of the family are often cited in evidence of the prosperity of Germany before the country was nearly ruined by the Thirty Years' War. In 1593 a collection of portraits of the chief representatives of the Fugger race, engraved by D. Custos of Antwerp, was issued at Augsburg. Editions with 127 portraits appeared at Augsburg in 1618 and 1620, the former accompanied by a genealogy in Latin, the latter by one in German. An edition which was published at Ulm in 1754 includes 139 portraits.

FUH-CHOW, more usually Foo-Chow, and in German Fu-Tschau, a city of China, capital of the province of Fuhkeen, and one of the principal ports open to foreign commerce. In the local dialect it is called Hokchin. It is situated on the river Min, about 35 miles from the sea, in 26° 5′ N. lat. and 119° 20′ E. long., 140 miles N. of Amoy, and 280 S. of Hang-Chow. The city proper, lying nearly three miles from the north bank of the river, is surrounded by a wall about 30 feet high and 12 feet thick, which makes a circuit of upwards of five miles and is pierced by seven gateways surrounded by tall fantastic watch-towers. The whole district between the city and the river, the island of Nantai, and the southern banks of the Min are occupied by extensive suburbs; and the river itself bears a large floating population. Communication from bank to bank is afforded by a long stone bridge supported by forty solid stone piers in its northern section and by nine in its southern. The most remarkable establishment of Fuh-Chow is the arsenal, situated about three miles down the stream at Pagoda Island, where the sea-going vessels usually anchor. It was founded in 1867, and is conducted under the direction of French engineers according to European methods. In 1870 it employed about 1000 workmen besides fifty European superintendents. The port was opened to European commerce in 1842; and in 1853 the firm of Russell and Co. shipped the first cargoes of tea from Fuh-Chow to Europe and America. The European firms now number thirteen; and the tea trade is second in importance only to that of Shanghai. In 1867, 550,239 piculs of tea were exported; in 1869, 581,003 piculs; in 1872, 642,841 piculs; in 1875, 723,732 piculs; and in 1876, 617,579. The total trade in foreign vessels in 1876 was imports to the value of £1,531,617 and exports to the value of £3,330,489. The number of vessels that entered in the same year was 275, and of these 211 were British, 27 German, 11 Danish, and 9 American. A large trade is carried on by the native merchants in timber, paper, woollen and cotton goods, oranges, and olives; but the foreign houses mainly confine themselves to opium and tea. Commercial intercourse with Australia and New Zealand is on the increase. The principal imports, besides opium, are shirtings, T cloths, lead and tin, medicines, rice, tobacco, and beans and pease. Two steamboat lines afford regular communication with Hong-Kong twice a month. The town is the seat of several important missions, of which the first was founded in 1846. That supported by the American Board had already in 1876 issued 1,300,000 copies of Chinese books and tracts. The population of Fuh-Chow is stated by the *Boston Missionary Herald*, Feb., 1872, at about 1,000,000; but A. E. Hippeslay in *Handelsstatistik der Vertagshäfen von China*, Vienna, 1874, the *Overland China Mail*, June, 1872, and the *Church Missionary Record*, Sept., 1872, are all quoted by Behm and Wagner, *Bevölkerung der Erde*, 1875, as giving the number 600,000.

FÜHRICH, Joseph von (1800–1876), a painter and contemporary of Cornelius and Overbeck, was born at Kratzau in Bohemia in 1800. Deeply impressed as a boy by rude pictures adorning the wayside chapels of his native country, his first attempt at composition was a sketch of the Nativity for the festival of Christmas in his father's house. He lived to see the day when, becoming celebrated as a composer of scriptural episodes, his sacred subjects were transferred in numberless repetitions to the roadside churches of the Austrian state, where humble peasants thus learnt to admire modern art reviving the models of earlier ages. Führich has been fairly described as a "Nazarene," a romantic religious artist whose pencil did more than any other to restore the old spirit of Dürer and give new shape to countless incidents of the gospel and scriptural legends. Without the power of Cornelius or the grace of Overbeck, he composed with great skill, especially in outline. His mastery of distribution, form, movement, and expression was considerable. In its peculiar way his drapery was perfectly cast. Essentially creative as a landscape draughtsman, he had still no feeling for color; and when he produced monumental pictures he was not nearly so successful as when designing subjects for woodcuts. That such a man as Führich should have lived and prospered in the same city as Rahl and Makart proves that Vienna had room for every form of artistic development. But Führich's fame extended far beyond the walls of the Austrian capital; and there are few in Germany who are not acquainted with his illustrations to Tieck's *Genofeva*, the Lord's Prayer, the Triumph of Christ, the Road to Bethlehem, the Succession of Christ according to Thomas à Kempis, the Prodigal Son, and the verses of the Psalter. His Prodigal Son, especially, is remarkable for the fancy with which the spirit of evil is embodied in a figure constantly recurring, and like that of Mephistopheles exhibiting temptation in a human yet demoniacal shape. Führich became a pupil of Bengler in the Academy of Prague in 1816. His first inspiration was derived from the prints of Dürer and the Faust of Cornelius, and the first fruit of this turn of study was the Genofeva series. In 1826 he went to Rome, where he added three frescoes to those executed by Cornelius and Overbeck in the Palazzo Massimi. His subjects were taken from the life of Tasso, and are almost solitary examples of his talent in this class of composition. In 1831 he finished the Triumph of Christ now in the Raczynski Palace at Berlin. In 1834 he was made custos and in 1841 professor of composition in the Academy of Vienna. After this he completed the monumental pictures of the church of St. Nepomuk, and in 1854–61 the vast series of wall paintings which cover the inside of the Lerchenfeld church at Vienna. In 1872 he was pensioned and made a knight of the order of Franz Joseph; 1875 is the date of his illustrations to the Psalms. He died on the 13th of March, 1876.

FULDA. The monastery of Fulda occupies the place in the ecclesiastical history of mid Germany which Monte Cassino holds in Italy, St. Galle in south Germany, Corvey in north Germany, Tours in France, and Iona in Scotland. It was the centre of a missionary work, both of conversion and reformation, organized on monastic principles. The monastery of Fulda, was only one of several founded by Boniface, the so-called "apostle of Germany," but it was specially favored by its founder, who selected it for his burying place, and it was by far the most important. The first abbot was Sturmius, the son of noble Christian parents in Noricum, who along with several other youths left their homes to follow Boniface, and were trained by him for missionary work. Boniface, notwithstanding his intense hatred of the Celtic missionaries, the true apostles of Germany, was content to imitate their mode of evangelical work; and the monastery of Fulda, though under Benedictine rule, in almost all respects resembled the great missionary institutions of Tours and Iona. Sturmius was sent by his master to seek for a convenient place for the monastery, and after two unsuccessful efforts he at length found a spot on the banks of the Fulda which Boniface approved of. A grant of the site, with four miles of surrounding demesne, was obtained from Carloman. Boniface himself superintended the clearing of the forest and the erection of the building. He sent Sturmius for a year to Italy to visit monasteries, and especially to study the mode of life in the great Benedictine convent of Monte Cassino. The Benedictine rule was adopted, and Sturmius with seven companions began their work of preaching, education, and civilization. They taught the rude tribes agriculture, masonry, and the other arts of peace. Soon a school was formed, and the educational organization seems to have resembled in the closest way that of the great Celtic monasteries. The school at Fulda speedily became the most famous portion of the monastery, and was the centre of the earlier mediæval theological learning. Rabanus Maurus, the first of the schoolmen, was a teacher in the convent school, and many of the most famous princes of the times were educated in the lay-school. When Alcuin laid the basis of the university system of mediæval Europe, it was to Fulda as well as to Durham and Scotland that he looked for help in carrying out his designs. Fulda became the parent of many other missionary monasteries, the most famous of these being Hirsgau in Swabia. In 968 the abbot of Fulda was recognized as primate of the other abbeys of Germany; but wealth and power brought corruption. In the beginning of the 11th century the monastery had to be reformed, and this was done by turning out the old monks, bringing a number of new ones from Scotland, and re-establishing in all its strictness the old Benedictine rule. The later history of Fulda has merely an antiquarian and local interest. Its practical work was done when the evangelization of Germany was complete; for Fulda, like the Celtic monasteries, was fitted for missionary work and little else. Investigations have shown curious sympathies with the Reformation of the 16th century among the abbots and monks of Fulda.

See the Life of Sturmius in Pertz's *Monumenta Germ.*, ii.; Rettberg's *Kirchen-Gesch. Deutschlands*; Milman's *Latin Christianity*, bk. iii. 5; and for the reformed tendencies of Fulda an interesting article in Niedner's *Zeitsch. für Hist. Theologie*, 1846.

FULHAM, a suburb of London, in the county of Middlesex, is situated on the Thames, 5½ miles S. W. of St. Paul's, and opposite Putney, with which it is connected by a curious old wooden bridge erected in 1729. In 1642 a bridge of boats was constructed across the river at this point by the earl of Essex, in order to convey his army into Surrey. Fulham has been connected with the see of London from a period long anterior to the conquest. The village is irregularly built, and has a somewhat old-fashioned and antique appearance. It contains an orphanage, a reformatory, and other charitable institutions. In the neighborhood there are a number of gentlemen's seats, and of old mansions which have been occupied by persons of celebrity. There are extensive nurseries and market gardens in the parish, and in the village there is a large pottery. The parish church, in the Decorated English style, possesses a picturesque tower 95 feet in height. In the church and churchyard there are a number of fine monuments of distinguished persons, including those of the bishops of London. The palace has been the summer residence of the bishops of London since the time of Henry VII., with the exception of the period of the Commonwealth when it was sold to Colonel Edmund Harvey. It is a large brick structure of various dates and of small architectural merit.

The grounds, which are surrounded by a moat, are 40 acres in extent. They are remarkable for the beauty of their arrangements, and contain many rare plants and shrubs. Fulham is included in the parliamentary borough of Chelsea. The population of the parish in 1871 was 23,350.

FULLER, ANDREW (1754–1815), a distinguished preacher and theological writer of the Baptist denomination, was born on the 6th of February, 1754, at Wicken, in Cambridgeshire, where his father was a small farmer, and received the rudiments of his education at the free school of Soham, to which place his parents had removed about 1760. Early in life he began to assist in the work of the farm, and he continued to do so till he was twenty years of age. In his seventeenth year he became a member of the Baptist church at Soham, and soon afterwards began to exercise his gifts as an exhorter with so great approval that, in the spring of 1775, he was called and ordained as pastor of that congregation. In 1782 he removed to Kettering in Northamptonshire, where, besides other advantages, he enjoyed that of frequent intercourse with some of the most eminent ministers of the denomination, such as Ryland, Sutcliff, and the Halls. About that time the Calvinism prevalent among the Baptists of England had come to be mingled and overlaid with many crudities which the Genevan Reformer would have disowned as foreign to his system; and for many years Fuller's intellectual and spiritual development had been much impeded, not only by the narrowness of his outward circumstances, and by the defects of his early education, but also by the contracted religious views of those to whom he had been accustomed to look for guidance. Even before leaving Soham, however, he had written the substance of a treatise, in which he had sought to counteract that hyper-Calvinism which, "admitting nothing spiritually good to be the duty of the unregenerate, and nothing to be addressed to them in a way of exhortation excepting what related to external obedience," had so long perplexed his own mind. This work he published, under the title *The Gospel worthy of all Acceptation*, soon after his settlement in Kettering; and although it immediately involved him in a somewhat bitter controversy which lasted for nearly 20 years, it was ultimately successful, as from its ability and force it deserved to be, in considerably modifying the views prevalent among English Dissenters with regard to the matters of which it treats. In 1793 he published a treatise in which the Calvinistic and Socinian systems were examined and compared as to their moral tendency. This work, which, along with another against Deism, entitled *The Gospel its own Witness*, is regarded as the production on which his reputation as a theologian mainly rests, was attacked by Toulmin and Kentish, to whom he replied in a supplementary pamphlet in which the weak side of Socinianism was still further exposed. Fuller also published an admirable *Memoir of the Rev. Samuel Pearce*, of Birmingham, and a volume of *Expository Lectures in Genesis*, besides a considerable number of smaller pieces, chiefly sermons and pamphlets, which have been issued in a collected form since his death, and like everything he did gave evidence of great intellectual vigor and acuteness as well as of deep religious convictions. Perhaps the most important services of his life, however, were those rendered in connection with the Baptist Missionary Society, which was formed at Kettering in 1792, and of which he was secretary until his death on the 7th of May, 1815. The correspondence he maintained, the journeys he undertook, the pamphlets he wrote in defence of the society, and the discourses he preached on its behalf, imply an amount of work which few men could possibly have overtaken, and which ultimately proved too heavy even for his naturally powerful constitution. Several editions of his collected works have appeared, and a *Memoir*, principally compiled from his own papers, was published about a year after his decease by Dr. Ryland, his most intimate friend and coadjutor in the affairs of the Baptist mission. There are also biographies by his son, the Rev. A. G. Fuller, and by the Rev. J. W. Morris.

FULLER, SARAH MARGARET. See OSSOLI.

FULLER, THOMAS (1608–1661), the witty divine and historian, eldest son of a father of the same name who was rector of Aldwincle St. Peter's, Northamptonshire, was born at the rectory house of that country parish in the year 1608, and was baptized on 19th June in that year. Dr. Robert Townson and Dr. John Davenant, bishops of Salisbury, were his uncles and godfathers. The boy's training was influenced by the position of these prelates and of other friends of his father, who was B.D., and had held the position of lector primarius in Trinity College, Cambridge. The youth studied under the care of the Rev. Arthur Smith, and of his cousin Dr. Edward Davenant, the mathematician. According to Aubrey, Fuller was "a boy of pregnant wit." At an early age he was admitted of Queen's College, Cambridge, then presided over by Dr. John Davenant. He was apt and quick in study; and in Lent, 1624–5, he became B.A., and in July, 1628, M.A. Being overlooked in an election of fellows of his college, he was removed by Bishop Davenant to Sidney Sussex College, November, 1628. In 1630 he received from Corpus Christi College, in the same university, the curacy of St. Benet's, which he held for a short time, and where he had for a parishioner the celebrated carrier Hobson. Fuller's quaint and humorous oratory, as displayed in his sermons on Ruth, soon attracted attention. He also attained a certain fame in the university as a writer of verses, and as the author of a poem, 1631, on the subject of David and Bathsheba. In June of the same year his uncle gave him a prebend in Salisbury, where his father, who died in the following year, held a canonry. The rectory of Broadwindsor, Dorsetshire, then in the diocese of Bristol, was his next preferment (1634); and 11th June, 1635, he proceeded B.D. For about six years he devoted himself to his rustic flock, and meanwhile compiled *The Holy War*, being a history of the crusades (published in 1640), and *The Holy and Prophane States*, being a book of character biography (1642), both which deservedly popular works went through several editions. At this time Fuller was well known as a man of engaging manners, of good connections, and of literary tastes. Being, moreover, a cordial lover of the Church of England, and of its discipline as fixed by the canons of 1603, he was in 1640 elected proctor for Bristol in the memorable convocation of Canterbury, which assembled with the Short Parliament. On the sudden dissolution of the latter, he united himself to those who urged that convocation should likewise dissolve as usual. That opinion was overruled; and the assembly continued to sit by virtue of a royal writ, and to frame, amongst its canons, the much-ridiculed Etcetera Oath. Fuller has left a valuable account of the proceedings of this synod, for sitting in which he was fined £200, but was never pressed to pay it. Meanwhile he preached in some of the "voiced pulpits" of London, and was followed for his excellent gifts. His first published volume of sermons appeared in 1640 under the title of *Joseph's parti-colored Coat*, 4to, which contains many of his quaint utterances and odd conceits. His grosser mannerisms of style, derived from the divines of the former generation, disappeared for the most part in his subsequent discourses. About 1640 he married Eleanor, daughter of Hugh Grove of Chisenbury, co. Wilts. Their eldest child, John, baptized at Broadwindsor by his father, 6th June, 1641, was afterwards of Sidney Sussex College, edited the *Worthies of England*, 1662, and became rector of Great Wakering, Essex, where he died in 1687. At Broadwindsor, early in the year 1641, Thomas Fuller, his curate Henry Sanders, the church wardens, and others, nine persons altogether, certified that their parish, represented by 242 grown-up male persons, had taken the Protestation ordered by the Speaker of the Long Parliament. Again Fuller is met with in London, interested in the coming strife. He is said to have foreseen whither the commotions were tending; and he directed his efforts, as events developed, in advocacy of peace and in preservation of the interests of his order. For a short time he preached with success at the Inns of Court, and thence removed, at the invitation of the master of the Savoy (Dr. Balcanqual) and the brotherhood of that foundation, to be lecturer at their chapel of St. Mary Savoy. Certain of the parishioners would have elected one Thomas Gibbs, whose claims were put forward in the House of Commons by Sir Robert Harley; but the greater number earnestly desired Fuller, whose better title was upheld in the House by Sir John Northcote, M.P. for Ashburton. Some of the best discourses of the witty preacher were delivered at the Savoy to audiences which extended into the chapel-yard. In one, he set forth with searching and truthful minuteness the hindrances to peace, and urged the signing of petitions to the king at Oxford, and to the parliament, to continue their care in advancing an accommodation. In his intercourse with persons of influence who attended upon his ministry, or who resided in the neighborhood of his cure, Fuller, with all the earnestness of Lord Falkland in that direction, labored to promote the same peaceful views. With these honorable efforts an historic circumstance of some significance connects itself. With Sir Edward Wardour, clerk of the pells, Dr. Dukeson, and four or five others, Fuller was deputed to take an influential peace petition to the king, emanating from the city of Westminster and the parishes contiguous to the Savoy. To carry it with fitting circumstance, a pass was granted by the House of Lords, 2d January, 1643, for an equipage of two coaches, four or six horses, and eight or ten attendants. On the arrival of the deputation at Uxbridge, 4th January, officers of the Parliamentary army stopped the coaches and searched the gentlemen; and they found upon the latter "two scandalous books arraigning the proceedings of the House," and letters with ciphers to Lord Viscount Falkland and the Lord Spencer. A message was then sent to acquaint the House of Commons with the matter, and it was complained that the Lords had given the pass. Ultimately a joint order of both Houses remanded the party; and Fuller and his friends suffered a brief imprisonment. The Westminster Petition, notwithstanding, reached the king's hands; and it was published with the royal reply. When it was expected, three months later, that a favorable result would attend the negotiations at Oxford, Fuller preached a remarkable sermon in the old abbey of Westminster, 27th March, 1643, on the text 2 Sam. xix. 30, the occasion being the anniversary of Charles I.'s accession and the subject, his return to "our English Zion." This loyal discourse, in accord with the loyal text, brought the preacher into disfavor in the city. Domestic trouble likewise overtook him in the death of his wife. On 19th April the Lords gave him a pass to and from Salisbury to carry her remains thither, to be buried, as it seems, amongst her own kin. He returned to London, and on Wednesday, 26th July, he preached on church reformation, satirizing the religious reformers, and maintaining that only the Supreme Power could initiate reforms. The storm which this sermon aroused in the metropolis, then well-nigh abandoned by the active royalists, brought about Fuller's secret flight to Oxford, and the loss of all his preferments and property. He lived in a hired chamber at Lincoln College for 17 weeks. Thence he put forth a witty and effective reply to John Saltmarsh, who had attacked his views on ecclesiastical reform. Fuller subsequently published by royal request a fast sermon preached 10th May, 1644, at St. Mary's, Oxford, before the king and Prince Charles, called *Jacob's Vow*. In this discourse which, it is supposed, had relation to the king's proposed restoration of the church lands, the preacher referred to some religious exercise then being observed every Tuesday by Charles I., all record of which has been omitted in the pages of history. The spirit of Fuller's preaching, always characterized by calmness and moderation, gave offence to the high royalists, who charged him with lukewarmness in their cause. To silence unjust censures, he became chaplain to the regiment of the excellent Lord Hopton. For the first five years of the war, as he said, when excusing the non-appearance of his *Church-History*, "I had little list or leisure to write, fearing to be made a history, and shifting daily for my safety. All that time I could not live to study, who did only study to live." After the defeat of Hopton at Cheriton Down, Fuller retreated to Basing House. He took an active part in its defence, and was once incited by the noise of the enemy's artillery, which disturbed him at his books, to head a sally upon the trenches. His life with the troops caused him to be afterwards regarded as one of "the great cavalier parsons." In his marches with his regiment round about Oxford and in the west, he devoted much time to the collection of details, from churches, old buildings, and the conversation of ancient gossips, for his *Church-History* and *Worthies of England*. His patriotism in the national crisis was evidenced in many ways. For the soldiers and the more religious of the royalist party he compiled, 1645, a small volume of prayers and meditations,—the *Good Thoughts in Bad Times*,—which, set up and printed in the besieged city of Exeter, whither he had retired, was called by himself "the first fruits of Exeter press." It was inscribed to Lady Dalkeith, governess to the infant princess, Henrietta Anne, who was born at Exeter, 16th June, 1644. Fuller was by the king placed in the household of the princess through the influence of Lady Dalkeith. In this city, as elsewhere, he attracted to himself a circle of friends. The corporation gave him the Bodleian lectureship, 21st March, 1645-46, and he held it until 17th June following, soon after the surrender of the city to the Parliament. *The Fear of losing the Old Light*, 4to, 1646, was his farewell discourse to his Exeter friends. Under the Articles of Surrender Fuller made his composition with the Government at London, his "delinquency" being that he had been present in the king's garrisons. In a characteristic petition to compound, dated 1st June, 1646, he acquainted the committee that he was then lodging at "the Crown" in St. Paul's Church-yard (the sign of his bookseller, Williams); and the word *Crown* is written in large letters and designedly falls in the centre of the document, in which, moreover, there are traces of the disagreeable position in which he was placed. In a life of Andronicus, 1646, partly authentic and partly fictitious, he satirized the leaders of the Revolution; and more than one edition of this little book was called for. For the comfort of sufferers by the war he issued, 1647, a second devotional manual, entitled *Good Thoughts in Worse Times*, abounding, like its predecessor and its successor, in fervent aspirations, and drawing moral lessons in beautiful language out of the events of his life or the circumstances of the time. In grief over his losses which included his library and manuscripts (his "upper and nether millstone,") and over the calamities of the country, he wrote his work on the *Wounded Conscience*, 1647. It was prepared at Boughton House in his native county, where, in a penniless, feeble, and exiled position, he and his little son were entertained by Edward Lord Mountagu, his patron, and where, as he says, he was restored to his former self. For the next few years of his life, Fuller was mainly dependent upon his dealings with booksellers, of whom he asserted that none had ever lost by him. Amongst other minor productions of his pen at this time he seems to have made considerable progress in an English translation of the *Annales* of his friend Archbishop Ussher from the MS. of that great work. Amongst his benefactors it is curious to find Sir John Danvers of Chelsea, afterwards the regicide. Under the countenance of citizens whose names are perpetuated in the dedications in his books, Fuller in 1647 began to preach at St. Clement's, East Cheap, and elsewhere, in the capacity of lecturer. While at St. Clement's he was suspended; but speedily recovering his freedom, he preached wherever he was invited. His connection with the church named has recently been recognized by the erection of a fine memorial window in which, clad in a doctor's gown, he stands holding in his hand his best gift to the universal church. At Chelsea, where also he occasionally officiated, he covertly preached a sermon on the death of Charles I.,—an event which he deeply deplored. Amongst Fuller's noble patrons was the earl of Carlisle, who made him his chaplain, and presented him to the curacy of Waltham Abbey. To this kind patron he dedicated his history of that foundation; and on the title-page placed the words—

"Patria est ubicunque est bene;
Bene vixit qui bene latuit."

His possession of the living was in jeopardy on the appointment of Cromwell's "Tryers;" but he evaded the inquisitorial questions of that dreaded body by his ready wit. He had, however, the good sense to fortify himself under this ordeal with the counsel of the catholic-minded John Howe, to whom he went, saying, "Sir, you may observe that I am a pretty corpulent man, and I am to go through a passage that is very straight; I beg you would be so good as to give me a shove and help me through." Nor was Fuller disturbed at Waltham in the "dangerous year" 1655, when the Protector's edict prohibited the adherents of the late king from preaching. Moreover, Lionel, third earl of Middlesex, who lived in the parish, gave him what remained of the books of the lord treasurer his father; and through the good offices of the marchioness of Hertford, part of his own pillaged library was restored to him. Under such circumstances Fuller actively prosecuted his literary labors, producing successively, at great cost, his survey of the Holy Land, called *A Pisgah-Sight of Palestine*, 1650; and his *Church-History of Britain*, 1655, from the birth of Jesus Christ until the year 1648. These works were furthered in no slight degree by his connection with Sion College, London, where he had a chamber, as well for the convenience of the press as of his city lectureships. The *Church-History* was angrily attacked by Dr. P. Heylin, who, in the spirit of High-Churchmanship, wished, as he said, to vindicate the truth, the church, and the injured clergy. About 1652 Fuller married into the noble and loyal family of Roper. By his wife (Mary, youngest sister of Thomas, Viscount Baltinglass) he had several children. At the Oxford Act of 1657, the celebrated Robert South, who was *Terræ filius*, lampooned Fuller for his frequent puns and other peculiarities. He described him in this *Oratio* as living in London, ever scribbling, and each year bringing forth new *folia* like a tree. At length, continues South, the *Church-History* came forth with its 166 dedications to wealthy and noble friends; and with this huge volume under one arm, and his wife (said to be little of stature) on the other, he ran up and down the streets of London, seeking at the houses of his patrons invitations to dinner, to be repaid by his dull jests at table. This speech, although exaggerated, throws light upon the social qualities of Fuller, who had many kind friends amongst the nobility. His last and best patron was the Hon. George Berkeley of Cranford House, Middlesex, whose chaplain he was, and who gave him Cranford rectory, 1658. To this nobleman Fuller's reply to Heylin, called *The Appeal of Injured Innocence*, 1659, was inscribed. This remarkable and instructive book embraces, as its editor, Mr. James Nichols, has remarked, "almost every topic within the range of human disquisition, from the most sublime mysteries of the Christian religion, and the great antiquity of the Hebrew and Welsh languages, down to the *The Tale of a Tub*, and criticisms on Shakespeare's perversion of the character of Sir John Falstaff." At the end of the *Appeal* is an elegant epistle "to my loving friend Dr. Peter Heylin," conceived in the admirable Christian spirit which characterized all Fuller's dealings with controversialists. "Why should *Peter*," he asked, "fall out with *Thomas*, both being disciples to the same Lord and Master? I assure you, sir, whatever you conceive to the contrary, I am cordial to the cause of the English Church, and my hoary hairs will go down to the grave in sorrow for her sufferings." The only other important works issued by Fuller in his lifetime were connected with the Restoration. The revived Long Parliament, December, 1659, proposed an oath of fealty to the Commonwealth, and the abjuration of Charles II. and his family. The matter was much debated; and in an able letter published in February, 1660, which went into a third edition, called *An Alarum to the Counties of England and Wales*, Fuller discussed the proposal. His arguments tended to swell the cry for a free and full parliament,—free from force, as he expressed it, as well as from abjurations or previous engagements. In anticipation of the meeting of the new parliament, 25th April, and as if foreseeing the unwise attitude of those in power in relation to the reaction, Fuller put forth his *Mixt Contemplations in Better Times*, 1660, dedicated to Lady Monk. It tendered advice in the spirit of its motto, "Let your moderation be known to all men: the Lord is at hand." There is good reason to suppose that Fuller was at the Hague immediately before the Restoration, in the retinue of Lord Berkeley, one of the commissioners of the House of Lords, whose last service to his friend was to interest himself in obtaining him a bishopric. A *Panegyrick to His Majesty on his Happy Return* was the last of Fuller's verse-efforts. On 2d August, by royal letters, he was admitted D.D. at Cambridge, as a scholar of integrity and good learning, who had been hindered in the due way of proceeding to his degree. His former preferments were restored to him. At the Savoy Pepys heard him preach; but he preferred his conversation or his books to his sermons. Fuller's last promotion was that of chaplain in extraordinary to Charles II. In the summer of 1661 he visited the west in connection with the business of his prebend, and upon his return he was seized with a kind of typhus-fever called the "new disease." On Sunday, 12th August, while preaching a marriage sermon at the Savoy, he was disabled from proceeding; and at the close of the service he was carried home in a sedan to his new lodgings in Covent-Garden, where he expired, Thursday, 16th August, aged 54. On the following day 200 of his brethren attended his corpse to its resting place in the chancel of Cranford Church, where Dr. Hardy preached a funeral sermon. A mural tablet was afterwards set up on the north side of the chancel with an epitaph, which, though perhaps longer than Fuller's essay on tombs might allow him to approve, contains a conceit worthy of his own pen, to the effect that while he was endeavoring (viz., in *The Worthies*) to give immortality to others, he himself attained it. It is said that the thought of that unfinished work troubled him upon his deathbed, and that he often incoherently called out to his attendants for pen and ink, as if to complete it.

Dr. Fuller was in stature somewhat tall, "with a proportionable bigness to become it," and his gait was graceful. He was of a sanguine temperament, and had a ruddy countenance and light curled hair. Some of these features are pleasingly depicted in his portrait at Cranford House. His personal character was admirable. The charm of his manners was felt by all, his deportment being "according to the old English guise." His disposition was genial, leading him to embrace goodness wherever he found it. To these fine qualities of mind he added prudence. "By his particular temper and management," said the historian Echard, "he weathered the late great storm with more success than many other great men." He had many of the peculiarities of scholars. He was known as "a perfect walking library." The strength of his memory was proverbial, and some amusing anecdotes are connected with it.

His writings were the product of a highly original mind, and their moral tone was excellent. He had a fertile imagination and a happy faculty of illustration. His diction in the main was elegant, and more idiomatic than that of Taylor or Browne. Antithetic and axiomatic sentences abound in his pages, embodying literally the wisdom of the many in the wit of one. He was "quaint," and something more. "Wit," said Coleridge, in a well-known eulogy, "wit was the stuff and substance of Fuller's intellect. It was the element, the earthen base, the material which he worked in; and this very circumstance has defrauded him of his due praise for the practical wisdom of the thoughts, for the beauty and variety of the truths, into which he shaped the stuff. Fuller was incomparably the most sensible, the least prejudiced, great man of an age that boasted a galaxy of great men." This opinion was formed after the perusal of the *Church-History*. That work and *The Worthies of England* are unquestionably Fuller's greatest efforts. They embody the collections of an entire life; and since his day they have been the delight and the solace of their readers, and the incentive which has directed or allured many English scholars into historical and topographical studies. The *Holy State* has taken rank amongst the best books of characters. Fuller's works, according to Charles Lamb, were, in the early portion of this century, scarcely perused except by antiquaries; but since that time, mainly through the appreciative criticisms of Coleridge, Southey, Crossley, and others, they have received more general attention; and nearly the whole of his extant writings have been reprinted of late years. (J. E. B.)

FULLER'S EARTH (Germ. *Walkererde*, Fr. *Terre à foulon*, *Argile smectique*), so named from its use by fullers as an absorbent of the grease and oil of cloth, is an earthy hydrated silicate of aluminium, containing, according to one analysis, silica 53·0, alumina 10, ferric oxide 9·75, magnesia 1·25, lime ·5, sodium chloride ·1, water 24 per cent., and a trace of potash. It has a specific gravity of 1·7–2·4 and a shining streak; is unctuous to the touch; is commonly greenish-brown or greenish-gray, sometimes bluish-gray, whitish, or red-brown in color; adheres but slightly to the tongue; becomes translucent in water, and falls to powder; and before the blowpipe gives a porous slag, melting eventually to a white glass. Among the localities where fuller's earth is found are Nutfield near Reigate in Surrey, Renton in Yorkshire, Quarry Wood in Morayshire, Rosswein in Saxony, and Zwikowetz in Bohemia. Fuller's or "Walker's" earth is found between the Aymestry limestone and the underlying lower Ludlow beds, rendering the former particularly liable to slides or subsidences (see Murchison, *Siluria*). From the presence in it of beds of the mineral, a thick deposit of blue and yellow clays with bands of rubbly limestone in the Oolitic or Jurassic series of rocks in England has received the name of Fuller's Earth (see GEOLOGY). The consumption of fuller's earth has fallen off considerably, owing to the employment of other substances for the cleansing of cloth. It was in past times largely mined in the Downs, south of Bath, for use in the cloth-mills of Bradford-on-Avon, Frome, and Gloucestershire.

FULMAR, from the Gaelic *Fulmaire*, the *Fulmaris glacialis* of modern ornithologists, one of the largest of the Petrels (*Procellariidæ*) of the northern hemisphere, being about the size of the Common Gull (*Larus canus*) and not unlike it in general coloration, except that its primaries are gray instead of black. This bird, which ranges over the North Atlantic, is seldom seen on the European side below lat. 53° N., but on the American side comes habitually to lat. 45°, or even lower. It has been commonly believed to have two breeding-places in the British Islands, namely, St. Kilda and South Barra; but, according to Mr. Robert Gray (*Birds of the West of Scotland*, p. 499), it has abandoned the latter since 1844, while he is assured of its now breeding in Skye. Northward it established itself about 1838 on Myggenæs Holm, one of the Faroes, while it has several stations off the coast of Iceland and Spitzbergen, as well as at Bear Island. Its range towards the pole seems to be only bounded by open water, and it is the constant attendant upon all who are employed in the whale and seal fisheries, showing the greatest boldness in approaching boats and ships, and feeding on the offal obtained from them. By our seamen it is commonly called the "Molly Mawk"[1] (corrupted from the Dutch *Mallemuck*), and is extremely well known to them, its flight, as it skims over the waves, first with a few beats of the wings and then gliding for a long way, being very peculiar. It only visits the land to deposit its single white egg, which is laid on a rocky ledge, where a shallow nest is made in the turf and lined with a little dried grass. Many of its breeding-places are a most valuable property to those who live near them and take the eggs and young, which, from the nature of the locality, are only to be had at a hazardous risk of life. In St. Kilda it is said that from 18,000 to 20,000 young are killed in one week of August, the only time when, by the custom of the community, they are allowed to be taken. These, after the oil is extracted from them, serve the islanders with food for the winter. This oil, says Mr. Gray, having been chemically examined by Mr. E. C. C. Stanford, was found to be a fish-oil, and to possess nearly all the qualities of that obtained from the liver of the cod, with a lighter specific gravity. It, however, has an extremely strong scent, which is said by those who have visited St. Kilda to pervade every thing and person on the island, and is certainly retained by an egg or skin of the bird for many years. Whenever a live example is seized in the hand it ejects a considerable quantity of this oil from its mouth. The Fulmar is said by Mr. Darwin (*Origin of Species*, ed. 4, p. 78) to be the most numerous bird in the world; but on whose authority the statement is made does not appear, and to render it probable we should have to unite specifically with the Atlantic bird, not only its Pacific representative, *F. pacificus*, which some ornithologists deem distinct, but also that which replaces it in the Antarctic seas and is considered by most authorities to be a perfectly good species, *F. glacialioides*. The differences between them are, however, exceedingly slight, and for Mr. Darwin's purpose on this particular occasion it matters little how they are regarded. It is a more interesting question whether the statement is anyhow true, but one that can hardly be decided as yet. (A. N.)

FULTON, ROBERT (1765–1815), an American engineer and mechanician, was born in 1765 at Little Britain in Pennsylvania. At the age of seventeen he adopted the profession of a portrait and landscape painter, but he also even then devoted a considerable portion of his time to mechanical pursuits. In his twenty-second year he visited England, with the view of improving himself in art by the instructions of his countryman West. There he made the acquaintance of the duke of Bridgewater, Earl Stanhope, and Watt; and partly by their influence he was led to devote his attention more exclusively to mechanical engineering. In 1793 he had conceived the design of propelling vessels by steam, but did not at that time find a suitable opportunity for putting his views into practice. His time was also much engrossed in devising a method of superseding the locks on canals by a plane of double incline for which he obtained a patent from the British Government in 1794. In the same year he obtained patents for flax-spinning and rope-twisting machines, and various other mechanical inventions, bearing chiefly upon the construction of canals, on which latter subject he published a treatise. In 1797 he removed to Paris, and remained for seven years in the house of Joel Barlow, the American minister at the court of France, prosecuting his scientific studies. During that period he projected the first panorama ever exhibited in Paris, and made important experiments on submarine explosives. These experiments were further continued in America, but although Congress voted him 5000 dollars for prosecuting them, his plans were finally declared impracticable. It was also at Paris that he first succeeded, after repeated trials, in propelling a boat through the water by the aid of steam. In 1806 he returned to America and repeated the experiment on a larger scale and with more decided success. In 1809 he took out his first patent, but his rights were disputed, and after protracted legislation a compromise was effected. In 1814 Fulton constructed the first United States' war steamer, and he was engaged upon an improvement of his submarine torpedo when he died, February 24, 1815.

See *Life of Robert Fulton*, by C. D. Colden, 1817, and the biography by James Renwick in Sparks's *American Biography*.

FUMITORY, or *Fumaria*, Linn. (Germ. *Erdrauch*, Fr. *Fumeterre*), a genus of annual, rarely perennial, herbs of the natural order *Fumariaceæ*, with stems usually branched and straggling, often climbing by means of their petioles; leaves alternate and decompound, with narrow segments; flowers in racemes, small, tubular, and purple or whitish, with purple tips; sepals 2, and deciduous; petals 4, and connivent, the upper one saccate or spurred at the base, the two inner cohering at the apex; stamens 6, and in two bundles opposite the outer petals; style deciduous; and capsule one-seeded and indehiscent. There are several British species of the genus. The Common Fumitory, *F. officinalis* (Germ. *Taubenkropf*), called by Shakespeare the "rank fumitory" or "fumiter" (*Henry V.*, v. 2; *Lear*, iv. 4), is a plant indigenous to Europe, North Africa, and Asia, and is found as an introduced species in the United States. It has glaucous leaves and pale or dark rose-purple flowers, which bloom throughout the summer, and grows to a height of one or two feet. It is a common weed in corn fields, and like other members of the genus flourishes best in rich cultivated ground. In past times it was in esteem for its reputed cholagogue and other medicinal properties, and in England, boiled in water, milk, or whey, it was used as a cosmetic. The herbage of *F. officinalis* and *F. racemosa* is used in China under the name of *Tsze-hwa-ti-ting* as an application for glandular swellings, carbuncles, and abscesses, and was formerly valued in jaundice, and in cases of accidental swallowing of the beard of grain (see F. Porter Smith, *Contrib. towards the Mat. Medica . . . of China*, p. 99, 1871). The name fumitory, Latin *fumus terræ*, has been supposed to be derived from the fact that its juice irritates the eyes like smoke (see Fuchs, *De Historia Stirpium*, p. 338, 1542); but *The Grete Herball*, cap. clxix., 1529, fol., following the *De Simplici Medecina* of Platearius, fo. xciii. (see in *Nicolai Præpositi Dispensatorium ad Aromatarios*, 1536), says: "It is called Fumus terre, fume or smoke of the erthe bycause it is engendred of a cours fumosyte rysynge frome the erthe in grete quantyte lyke smoke: this grosse or cours fumosyte of the erthe wyndeth and wryeth out: and by workynge of the ayre and sonne it turneth into this herbe."

For figures of various species of fumitory, see J. T. Boswell Syme, *English Botany*, vol. i., 1863.

FUNCHAL. See MADEIRA.

FUNCTION. Functionality, in Analysis, is dependence on a variable or variables; in the case of a single variable u, it is the same thing to say that v depends upon u, or to say that v is a function of u, only in the latter form of expression the mode of dependence is embodied in the term "function." We have given or known functions such as u^2 or $\sin u$, and the general notation of the form ϕu, where the letter ϕ is used as a functional symbol to denote a function of u, known or unknown as the case may be: in each case u is the independent variable or argument of the function, but it is to be observed that if v be a function of u, then v like u is a variable, the values of v regarded as known serve to determine those of u; that is, we may conversely regard u as a function of v. In the case of two or more independent variables, say when w depends on or is a function of u, v, etc., or $w=\phi(u, v, \ldots)$, then $u, v, \ldots$ are the independent variables or arguments of the function; frequently when one of these variables, say u, is principally or alone attended to, it is regarded as the independent variable or argument of the function, and the other variables v, etc., are regarded as parameters, the values of which serve to complete the definition of the function. We may have a set of quantities $w, t, \ldots$ each of them a function of the same variables $u, v, \ldots$; and this relation may be expressed by means of a single functional symbol ϕ, $(w, t, \ldots) = \phi(u, v \ldots)$; but, as to this, more hereafter.

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[1] A name misapplied in the southern hemisphere to *Diomedea melanophrys*, one of the Albatrosses.

The notion of a function is applicable in geometry and mechanics as well as in analysis; for instance, a point Q, the position of which depends upon that of a variable point P, may be regarded as a function of the point P; but here, substituting for the points themselves the co-ordinates (of any kind whatever) which determine their positions, we may say that the co-ordinates of Q are each of them a function of the co-ordinates of P, and we thus return to the analytical notion of a function. And in what follows a function is regarded exclusively in this point of view, viz., the variables are regarded as numbers; and we attend to the case of a function of one variable $v = fu$. But it has been remarked (see Equation) that it is not allowable to confine the attention to *real* numbers; a number u must in general be taken to be a complex number $u = x + iy$, x and y being real numbers, each susceptible of continuous variation between the limits $-\infty$, $+\infty$, and i denoting $\sqrt{-1}$. In regard to any particular function, fu, although it may for some purposes be sufficient to know the value of the function for any real value whatever of u, yet to attend only to the real values of u is an essentially incomplete view of the question; to properly know the function it is necessary to consider u under the aforesaid imaginary or complex form $u = x + iy$.

To a given value $x + iy$ of u there corresponds in general for v a value or values of the like form $v = x' + iy'$, and we obtain a geometrical notion of the meaning of the functional relation $v = fu$ by regarding x, y as rectangular co-ordinates of a point P in a plane Π, and x', y' as rectangular co-ordinates of a point P′ in a plane (for greater convenience a different plane) Π'; P, P′ are thus the geometrical representations, or representative points, of the variables $u = x + iy$ and $u' = x' + iy'$ respectively; and, according to a locution above referred to, the point P′ might be regarded as a function of the point P; a given value of $u = x + iy$ is thus represented by a point P in the plane Π, and corresponding hereto we have a point or points P′ in the plane Π', representing (if more than one, each of them) a value of the variable $v = x' + iy'$. And, if we attend only to the values of u as corresponding to a series of positions of the representative point P, we have the notion of the "path" of a complex variable $u = x + iy$.

Known Functions.

1. The most simple kind of function is the rational and integral function. We have the series of powers u^2, u^3, . . each calculable not only for a real but also for a complex value of u, $(x + iy)^2 = x^2 + i^2y^2 + 2ixy$, $(x + iy)^3 = x^3 + i(3x^2 + 3ixy^2 + i^2y^3)$, etc., and thence, if $a, b, \ldots$ be real or complex numbers, the general form $a + bu + cu^2 \ldots + ku^m$, of a rational and integral function of the order m. And taking two such functions, say of the orders m and n respectively, the quotient of one of these by the other represents the general form of a rational function of u.

The function which next presents itself is the algebraical function, and in particular the algebraical function expressible by radicals. To take the most simple case, suppose (m being a positive integer) that $v^m = u$; v is here the irrational function $= u^{\frac{1}{m}}$. Obviously, if u is real and positive, there is always a real and positive value of v, calculable to any extent of approximation from the equation $v^m = u$, which serves as the definition of $u^{\frac{1}{m}}$; but it is known (see Equation) that as well in this case as in the general case where u is a complex number there are in fact m values of the function $u^{\frac{1}{m}}$; and that for their determination we require the theory of the so-called circular functions sine and cosine; and these depend on the exponential function exp u, or, as it is commonly written, e^u, which has for its inverse the logarithmic function log u; these are all of them transcendental functions.

2. In a rational and integral function $a + bu + cu^2 \ldots + ku^m$, the number of terms is finite, and the coefficients $a, b, \ldots k$ may have any values whatever, but if we imagine a like series $a + bu + cu^2 + \ldots$ extending to infinity, *non constat* that such an expression has any calculable value—that is, any meaning at all; the coefficients $a, b, c \ldots$ must be such as, either for every value whatever of u (that is, for every finite value) or for values included within certain limits, to make the series *convergent*. It is easy to see that the values of $a, b, c \ldots$ may be such as to make the series always convergent; for instance, this is the case for the exponental function,

$$\exp u = 1 + \frac{u}{1} + \frac{u^2}{1.2} + \frac{u^3}{1.2.3} +, \text{ etc.};$$

taking for the moment u to be real and positive, then it is evident that however large u may be, the successive terms will become ultimately smaller and smaller, and the series will have a determinate calculable value. A function thus expressed by means of a convergent infinite series is not in general algebraical, and when it is not so, it is said to be transcendental (but observe that it is in nowise true that we have thus the most general form of a transcendental function); in particular, the exponential function above written down is not an algebraical function.

By forming the expression of exp v, and multiplying together the two series, we derive the fundamental property

$$\exp u \exp v = \exp (u + v);$$

whence also

$$\exp x \exp iy = \exp (x + iy),$$

so that exp $(x + iy)$ is given as the product of the two series exp x and exp iy. As regards this last, if in place of u we actually write the value iy, we find

$$\exp iy = \left(1 - \frac{y^2}{1.2} + \frac{y^4}{1.2.3.4} - \ldots\right) + i\left(y - \frac{y^3}{1.2.3} + \ldots\right),$$

where obviously each series is convergent and actually calculable for any real value whatever of y, calling the two series cosine y and sine y respectively, or in the ordinary abbreviated notation cos y and sin y, the equation is

$$\exp iy = \cos y + i \sin y;$$

and if we herein for y write z, and multiply the two expressions together, observing that the product will be $= \exp i\,(y + z)$, we obtain the fundamental equations

$$\cos (y + z) = \cos y \cos z - \sin y \sin z;$$
$$\sin (y + z) = \sin y \cos z + \sin z \cos y,$$

for the functions sine and cosine.

Taking y as an angle, and defining as usual the sine and cosine as the ratios of the perpendicular and base respectively to the radius, the sine and cosine will be functions of y; and we obtain geometrically the foregoing fundamental equations for the sine and cosine; but in order to the truth of the foregoing equation $\exp iy = \cos y + i \sin y$, it is further necessary that the angle should be measured in circular measure, that is by the ratio of the arc to the radius; so that π denoting as usual the number 3·14159 . . , the measure of a right angle is $= \frac{1}{2}\pi$. And this being so, the functions sine and cosine, obtained as above by consideration of the exponential function, have their ordinary geometrical significations.

3. The foregoing investigation was given in detail in order to the completion of the theory of the irrational function $u^{\frac{1}{m}}$. We henceforth take the theory of the circular functions as known, and speak of tan x, etc., as the occasion may arise.

We have

$$x + iy = r(\cos \theta + i \sin \theta),$$

where, writing $\sqrt{x^2 + y^2}$ to denote the positive value of the square root, we have

$$r = \sqrt{x^2 + y^2}, \quad \cos \theta = \frac{x}{\sqrt{x^2 + y^2}}, \quad \sin \theta = \frac{y}{\sqrt{x^2 + y^2}},$$

and therefore also

$$\tan \theta = \frac{y}{x}.$$

Treating x, y as the rectangular co-ordinates of a point P, r is the distance (regarded as positive) of this point from the origin, and θ is the inclination of r to the positive part of the axis of x; to fix the ideas θ may be regarded as lying within the limits $0, \pi$, or $0, -\pi$, according as y is positive or negative; θ is thus completely determinate, except in the case, x negative $= 0$, for which θ is $= \pi$ or $-\pi$ indifferently.

And if $u = x + iy$, we hence have

$$u^{\frac{1}{m}} = (x + iy)^{\frac{1}{m}} = r^{\frac{1}{m}}\left(\cos \frac{\theta + 2s\pi}{m} + i \sin \frac{\theta + 2s\pi}{m}\right),$$

where $r^{\frac{1}{m}}$ is real and positive and s has any positive or negative integer value whatever, but we thus obtain for $u^{\frac{1}{m}}$ only the m values corresponding to the values $0, 1, 2 \ldots m - 1$ of s. More generally we may, instead of the index $\frac{1}{m}$, take the index to be any rational fraction $\frac{n}{m}$. Supposing this to be in its least terms, and m to be positive, the number of distinct values is always $= m$. If instead of $\frac{n}{m}$ we take the index to be the general real or complex quantity m, we have u^m, no longer an algebraical function of u, and having in general an infinity of values.

4. The foregoing equation $\exp(x+y) = \exp x . \exp y$ is in fact the equation of indices, $a^{x+y} = a^x . a^y$; $\exp x$ is thus the same thing as e^x, where e denotes a properly determined number, and putting e^x equal to the series, and then writing $x = 1$, we have $e = 1 + \frac{1}{1} + \frac{1}{1.2} + \frac{1}{1.2.3} + \text{etc.}$, that is, $e = 2{\cdot}7128 \ldots$ But as well theoretically as for convenience of printing, there is considerable advantage in the use of the notation $\exp u$.

From the equation, $\exp iy = \cos y + i \sin y$, we deduce $\exp(-iy) = \cos y - i \sin y$, and thence

$$\cos y = \frac{1}{2}\left\{\exp(iy) + \exp(-iy)\right\},$$

$$\sin y = \frac{1}{2i}\left\{\exp(iy) - \exp(-iy)\right\};$$

if we write herein ix instead of y we have

$$\cos ix = \frac{1}{2}\left\{\exp x + \exp(-x)\right\},$$

$$\sin ix = \frac{i}{2}\left\{\exp x - \exp(-x)\right\},$$

viz., these values are

$$\cos ix = 1 + \frac{x^2}{1.2} + \frac{x^4}{1.2.3.4} + \,.\,.$$

$$\frac{1}{i}\sin ix = x + \frac{x^3}{1.2.3} + \,.\,.$$

each of them real when x is real; the functions in question $1 + \frac{x^3}{1.2} + \frac{x^4}{1.2.3.4} + \,.\,.$ and $x + \frac{x^3}{1.2.3} + \ldots$, regarded as functions of x, are termed the hyperbolic cosine and sine, and are represented by the notations $\cosh x$ and $\sinh x$ respectively; and similarly we have the hyperbolic tangent $\tanh x$, etc.: although it is easy to remember that $\cos ix \frac{1}{i} \sin ix$, are in fact real functions of x, and to understand accordingly the formulæ wherein they occur, yet the use of these notations of the hyperbolic functions is often convenient.

5. Writing $u = \exp v$ then v is conversely a function of u which is called the logarithm (hyperbolic logarithm, to distinguish it from the tabular or Briggian logarithm), and we write $v = \log u$, or what is the same thing, we have $u = \exp(\log u)$ (and it is clear that if u be real and positive there is always a real and positive value of $\log u$, in particular the real logarithm of e is $= 1$); it is however to be observed that the logarithm is not a one-valued function, but has an infinity of values corresponding to the different integer values of a constant s; in fact, if $\log u$ be any one of its values, then $\log u + 2s\pi i$ is also a value, for we have $\exp(\log u + 2s\pi i) = \exp \log u \exp 2s\pi i$, or since $\exp 2s\pi i$ is $= 1$, this is $= u$; that is, $\log u + 2s\pi i$ is a value of the logarithm of u.

We have

$$uv = \exp(\log uv) = \exp \log u \,.\, \exp \log v,$$

and hence the equation which is commonly written

$$\log uv = \log u + \log v,$$

but which requires the addition on one side of a term $2s\pi i$. And reverting to the equation $x + iy = r(\cos\theta + i \sin\theta)$, or as it is convenient to write it, $x + iy = r \exp i\theta$, we hence have

$$\log(x + iy) = \log r + i(\theta + 2s\pi),$$

where $\log r$ may be taken to denote the real logarithm of the real positive quantity r, and θ the completely determinate angle defined as already mentioned.

Reverting to the function u^m, we have $u = \exp \log u$, and thence $u^m = \exp(m \log u)$, which, on account of the infinity of values of $\log u$, has in general (as before remarked) an infinity of values; if $u = e$, then $e^m, = \exp(m \log e)$, has in general in like manner an infinity of values, but in regarding e^m as identical with the one-valued function $\exp m$, we take $\log e$ to be $=$ its real value, 1.

The inverse functions $\cos^{-1} x$, $\sin^{-1} x$, $\tan^{-1} x$, are in fact logarithmic functions; thus in the equation $\exp ix = \cos x + i \sin x$ writing first $\cos x = u$, the equation becomes $\exp i \cos^{-1} u = u + i\sqrt{1-u^2}$, or we have $\cos^{-1} u = \frac{1}{i} \log(u + i\sqrt{1-u^2})$, and from the same equation, writing secondly $\sin x = u$, we have $\sin^{-1} u = \frac{1}{i} \log(\sqrt{1-u^2} + iu)$. But the formula for $\tan^{-1} u$ is a more elegant one, as not involving the radical $\sqrt{1-u^2}$; we have

$$i \tan x = \frac{\exp ix - \exp(-ix)}{\exp ix + \exp(-ix)}, = \frac{\exp 2ix - 1}{\exp 2ix + 1},$$

and thence

$$\exp 2ix = \frac{1 + i \tan x}{1 - i \tan x},$$

that is,

$$x = \frac{1}{2i} \log \frac{1 + i \tan x}{1 - i \tan x},$$

or if $\tan x = u$, then

$$\tan^{-1} u = \frac{1}{2i} \log \frac{1 + iu}{1 - iu}.$$

The logarithm (or inverse exponential function) and the inverse circular functions present themselves as the integrals of algebraic functions

$$\int \frac{dx}{x} = \log x,$$

whence also

$$\int \frac{dx}{1 + x^2} = \frac{1}{2i} \log \frac{1 + ix}{1 - ix} = \tan^{-1} x,$$

and

$$\int \frac{dx}{\sqrt{1 - x^2}} = \sin^{-1} x.$$

6. Each of the functions $\exp u$, $\sin u$, $\cos u$, $\tan u$, etc., as a one-valued function of u, is in this respect analogous to a rational function of u; and there are further analogies of $\exp u$, $\sin u$, $\cos u$, to a rational and integral function; and of $\tan u$, $\sec u$, etc., to a rational non-integral function.

A rational and integral function has a certain number of roots, or zeros, each of a given multiplicity, and is completely determined (except as to a constant factor) when the several roots and the multiplicity of each of them is given; *i.e.*, if $a, b, c \ldots$ be the roots, $p, q, r \ldots$ their multiplicities, then the form is $A\left(1 - \frac{u}{a}\right)^p \left(1 - \frac{u}{b}\right)^q \ldots$; a rational (non-integral) function has a certain number of infinities, or poles, each of them of a given multiplicity, viz., the infinities are the roots or zeros of the rational and integral function which is its denominator.

The function $\exp u$ has no finite roots, but an infinity of roots each $= -\infty$; this appears from the equation $\exp u = \left(1 + \frac{u}{n}\right)^n$, where n is indefinitely large and positive. The function $\sin u$ has the roots $s\pi$ where s is any positive or negative integer zero included; or what is the same thing, its roots are 0 and $\pm s\pi$, s now denoting any positive integer from 1 to ∞; each of these is a simple root, and we in fact have $\sin u = u\,\Pi\left(1 - \frac{u^2}{s^2\pi^2}\right)$. Similarly the roots of $\cos u$ are $(s + \frac{1}{2})\pi$, s denoting any positive or negative integer, zero included, or what is the same thing, they are $\pm(s + \frac{1}{2})\pi$, s now denoting any positive integer from 0 to ∞; each root is simple, and we have $\cos u = \Pi\left(1 - \frac{u^2}{(s + \frac{1}{2})^2\pi^2}\right)$. Obviously $\tan u$, as the quotient $\sin u \div \cos u$, has both roots and infinities, its roots being the roots of $\sin u$, its infinities the roots of $\cos u$; $\sec u$ as the reciprocal of $\cos u$ has infinities only, these being the roots of $\cos u$, etc.

In the foregoing expression $\sin u = u\,\Pi\left(1 - \frac{u^2}{s^2\pi^2}\right)$ the product must be understood to mean the limit of $\Pi_1^n\left(1 - \frac{u^2}{s^2\pi^2}\right)$ for an indefinitely large positive integer value of n, viz., the product is first to be formed for the values $s = 1, 2, 3 \ldots$ up to a determinate number n, and then n is to be taken indefinitely large. If, separating the positive and the negative values of s, we consider the product $u\,\Pi_1^n\left(1 + \frac{u}{s\pi}\right)\Pi_1^m\left(1 - \frac{u}{s\pi}\right)$, (where in the first product s has all the positive integer values from 1 to m, and in the second product s has all the positive integer values from 1 to n), then by making m and n each of them indefinitely large, the function does *not* approximate to $\sin u$, unless $m : n$ be a ratio of equality.[1] And similarly as regards $\cos u$, the product $\Pi_0^n\left(1 + \frac{u}{(s + \frac{1}{2})\pi}\right)\Pi\left(\frac{u}{(s + \frac{1}{2})\pi}\right)$, m and n indefinitely large, does not approximate to $\cos u$, unless $m : n$ be a ratio of equality.

7. The functions $\sin u$, $\cos u$, are *periodic*, having the period 2π, $\begin{smallmatrix}\sin\\ \cos\end{smallmatrix}(u + 2\pi) = \begin{smallmatrix}\sin\\ \cos\end{smallmatrix}(u)$; and the half-period π, $\begin{smallmatrix}\sin\\ \cos\end{smallmatrix}(u + \pi) = -\begin{smallmatrix}\sin\\ \cos\end{smallmatrix}u$; the periodicity may be verified by means of the foregoing fractional forms, but some attention is required; thus

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[1] The value of the function in question $u\,\Pi_1^n\left(1 + \frac{u}{s\pi}\right)\Pi_1^m\left(1 + \frac{u}{s\pi}\right)$, when m, n are each indefinitely large, but $\frac{m}{n}$ not $= 1$, is $= \left(\frac{n}{m}\right)^{\frac{u}{\pi}} \sin u$.

writing, as we may do, $\sin u = \dfrac{\Pi(u+s\pi)}{\Pi s\pi}$, where s extends from $-n$ to n, n ultimately infinite, if for u we write $u+\pi$, each factor of the numerator is changed into the following one, and the numerator is unaltered, save only that there is an introduced factor $u+(n+1)\pi$ at the superior limit, and an omitted factor $u-n\pi$ at the inferior limit; the ratio of these $(u+\overline{n+1}\pi) \div (u-n\pi)$, for n infinite is $=-1$, and we thus have, as we should have, $\sin(u+\pi) = -\sin u$.

The most general periodic function having no infinities, and each root a simple root, and having a given period a, has the form $A\sin\dfrac{2\pi u}{a} + B\cos\dfrac{2\pi u}{a}$, or, what is the same thing, $L\,{}^{\sin}_{\cos}\left(\dfrac{2\pi u}{a}+\lambda\right)$.

8. We come now to the Elliptic Functions; these arose from the consideration of the integral $\displaystyle\int\frac{R\,dx}{\sqrt{X}}$, where R is a rational function of x, and X is the general rational and integral quartic function $\alpha x^4+\beta x^3+\gamma x^2+\delta x+\epsilon$; a form arrived at was

$$\int\frac{dx}{\sqrt{1-x^2.1-k^2x^2}}, = \int\frac{d\phi}{\sqrt{1-k^2\sin^2\phi}},$$

on putting therein $x=\sin\phi$, and this last integral was represented by $F\phi$, and called the elliptic integral of the first kind. In the particular case $k=0$, the integral is $\displaystyle\int\frac{dx}{\sqrt{1-x^2}} = \sin^{-1}x$, and it thus appears that $F\phi$ is of the nature of an inverse function; for passing to the direct functions we write $F\phi=u$, and consider ϕ as hereby determined as a function of u, ϕ = amplitude of u, or for shortness am u. And the functions $\sin\phi$, $\cos\phi$, and $\sqrt{1-k^2\sin^2\phi}$ were then considered as functions of the amplitude, and written sin am u, cos am u, Δ am u; these were afterwards written sn u, cn u, dn u, which may be regarded either as mere abbreviations of the former functional symbols, or (in a different point of view) as functions, no longer of am u, but of u itself as the argument of the functions; sn is thus a function in some respects analogous to a sine, and cn and dn functions analogous to a cosine; they have the corresponding property that the three functions of $u+v$ are expressible in terms of the functions of u and of v. The following formulæ may be mentioned:

$$\mathrm{cn}^2 u = 1-\mathrm{sn}^2 u,\ \mathrm{dn}^2 u = 1-k^2\,\mathrm{sn}^2 u.$$
$$\mathrm{sn}' u = \mathrm{cn}\,u\,\mathrm{dn}\,u,\ \mathrm{cn}' u = -\mathrm{sn}\,u\,\mathrm{dn}\,u,\ \mathrm{dn}' u = -k^2\,\mathrm{sn}\,u\,\mathrm{cn}\,u$$

(where the accent denotes differentiation in regard to u); and the addition-formulæ:

$$\begin{aligned}\mathrm{sn}(u+v) &= \mathrm{sn}\,u\,\mathrm{cn}\,u\,\mathrm{dn}\,v+\mathrm{sn}\,v\,\mathrm{cn}\,u\,\mathrm{dn}\,u, && (\div)\\ \mathrm{cn}(u+v) &= \mathrm{cn}\,u\,\mathrm{cn}\,v-\mathrm{sn}\,u\,\mathrm{dn}\,u\,\mathrm{sn}\,v\,\mathrm{dn}\,v, && (\div)\\ \mathrm{dn}(u+v) &= \mathrm{dn}\,u\,\mathrm{dn}\,v-k^2\,\mathrm{sn}\,u\,\mathrm{cn}\,u\,\mathrm{sn}\,v\,\mathrm{cn}\,v, && (\div)\end{aligned}$$

each of the expressions on the right-hand side being the numerator of a fraction of which

$$\text{Denom.} = 1-k^2\,\mathrm{sn}^2 u\,\mathrm{sn}^2 v.$$

It may be remarked that any one of the fractional expressions, differentiated in regard to u and to v respectively, gives the same result; such expression is therefore a function of $u+v$, and the addition-formulæ can be thus directly verified.

9. The existence of a denominator in the addition-formulæ suggests that sn, cn, dn are not, like the sine and cosine, functions having zeros only, without infinities; they are in fact functions, having each its own zeros, but having a common set of infinities; moreover, the zeros and the infinities are simple zeros and infinities respectively. And this further suggests, what in fact is the case, that the three functions are quotients having each its own numerator but a common denominator, say they are the quotients of four θ-functions, each of them having zeros only (and these simple zeros) but no infinities.

The functions sn, cn, dn, but not the θ-functions, are moreover *doubly periodic*; that is, there exist values 2ω, $2v$ ($=4K$ and $4(K+iK')$ in the ordinary notation), such that the sn, cn, or dn of $u+2\omega$, and the sn, cn, and dn of $u+2v$ are equal to the sn, cn, and dn respectively of u; or say that $\phi(u+2\omega) = \phi(u+2v) = \phi u$, where ϕ is any one of the three functions.

As regards this double periodicity, it is to be observed that the equations $\phi(u+2\omega)=\phi u$, $\phi(u+2v)=\phi u$, imply $\phi(u+2m\omega+2nv)=\phi u$, and hence it easily follows that if ω, v were commensurable, say if they were multiples of some quantity α, we should have $\phi(u+2\alpha)=\phi u$, an equation which would replace the original two equations $\phi(u+2\omega)=\phi u$, $\phi(u+2v)=\phi u$, or there would in this case be only the single period α; ω and v must therefore be incommensurable. And this being so, they cannot have a real ratio, for if they had, the integer values m, n could be taken such as to make $2m\omega+2nv=k$ times a given real or imaginary value, k *as small as we please*; the ratio $\omega : v$ must be therefore imaginary (as is in fact the case when the values are $4K$ and $4(K+iK')$).

10. The function sn u has the zero 0 and the zeros $m\omega+nv$, m and n any positive or negative integers whatever, and this suggests that the numerator of sn u is equal to a doubly infinite product (Cayley, "On the Inverse Elliptic Functions," *Camb. Math. Jour.*, t. iv., 1845; and "Mémoire sur les fonctions doublement périodiques," *Liouville*, t. x., 1845). The numerator is equal to

$$u\Pi\Pi\left(1+\frac{u}{m\omega+nv}\right),$$

m and n having any positive or negative integer values whatever, including zero, except that m, n must not be simultaneously $=0$, these values being taken account of in the factor u outside the product. But until further defined, such a product has no definite value, nor consequently any meaning whatever. Imagine m, n to be co-ordinates, and suppose that we have surrounding the origin a closed curve having the origin for its centre (*i. e.*, the curve is such that if α, β be the co-ordinates of a point thereof, then $-\alpha$, $-\beta$ are also the co-ordinates of a point thereof); suppose further that the form of the curve is given, but that its magnitude depends upon a parameter h, and that the curve is such that, when h is indefinitely large, each point of the curve is at an indefinitely large distance from the origin; for instance, the curve might be a circle or ellipse, or a parallelogram, the origin being in each case the centre. Then if in the double product, taking the value of h as given, we first give to m, n all the positive or negative integer values (the simultaneous values 0, 0 excluded) which correspond to points within the curve, and then make h indefinitely large, the product will thus have a definite value; *but this value will still be dependent on the form of the curve.* Moreover, varying in any manner the form of the curve, the ratio of the two values of the double product will be = exp βu^2, where β is a determinate value depending only on the forms of the two curves; or what is the same thing, if we first give to the curve a certain form, say we take it to be a circle, and then give it any other form, the product in the latter case is equal to its former value into exp βu^2, where β depends only upon the form of the curve in the latter case.

Considering the form of the bounding curve as given, and writing the double product in the form

$$\Pi\Pi\left(\frac{u+m\omega+nv}{m\omega+nv}\right),$$

the simultaneous values $m=0$, $n=0$ being now admitted in the numerator, although still excluded from the denominator, then if we write for instance $u+2\omega$ instead of u, each factor in the numerator is changed into a contiguous factor, and the numerator remains unaltered, except that we introduce certain factors which lie outside the bounding curve, and omit certain factors which lie inside the bounding curve; we in fact affect the result by a singly infinite series of factors belonging to points adjacent to the bounding curve; and it appears on investigation that we thus introduce a constant factor exp $\gamma(u+\omega)$. The final result thus is that the product

$$u\Pi\Pi\left(1+\frac{u}{m\omega+nv}\right)$$

does not remain unaltered when u is changed into $u+2\omega$, but that it becomes therefore affected with a constant factor, exp $\gamma(u+\omega)$. And similarly the function does not remain unaltered when u is changed into $u+2v$, but it becomes affected with a factor, exp $\delta(u+v)$. The bounding curve may however be taken such that the function is unaltered when u is changed into $u+2\omega$, this will be the case if the curve is a rectangle such that the length in the direction of the axis of m is infinitely great in comparison of that in the direction of the axis of n; or it may be taken such that the function is unaltered when u is changed into $u+2v$, this will be so if the curve be a rectangle such that the length in the direction of the axis of n is indefinitely great in comparison with that in the direction of the axis of m; but the two conditions cannot be satisfied simultaneously.

11. We have three other like functions, viz., writing for shortness $\overline{m}$, $\overline{n}$ to denote $m+\frac{1}{2}$, $n+\frac{1}{2}$ respectively, and (m, n) to denote $m\omega+nv$, then the four functions are

$$u\Pi\Pi\left(1+\frac{u}{(m,n)}\right), \Pi\Pi\left(1+\frac{u}{(\overline{m},n)}\right), \Pi\Pi\left(1+\frac{u}{(m,\overline{n})}\right), \Pi\Pi\left(1+\frac{u}{(\overline{m},\overline{n})}\right),$$

the bounding curve being in each case the same; and, dividing the first three of these each by the last, we have (except as to constant factors) the three functions sn u, cn u, dn u; writing in each of the four functions $u+2\omega$ or $u+2v$ in place of u, the functions acquire each of them the *same* exponential factor exp $\gamma(u+\omega)$, or exp $\delta(u+v)$, and the quotient of any two of them, and therefore each of the functions sn u, cn u, dn u, remains unaltered.

It is easily seen that, disregarding constant factors, the four θ-functions are in fact one and the same function, with different arguments, or they may be written θu, $\theta(u+\frac{1}{2}\omega)$, $\theta(u+\frac{1}{2}v)$,

$\theta\,(u + \frac{1}{2}\omega + \frac{1}{2}v)$; by what precedes the functions may be so determined that they shall remain unaltered when u is changed into $u + 2\omega$ (that is, be singly periodic), but that the change u into $u + 2v$ shall affect them each with the same exponential factor $\exp\delta\,(u + v)$.

12. Taking the last-mentioned property as a definition of the function θ, it appears that θu may be expressed as a sum of exponentials

$$\theta u = \mathrm{A}\Sigma \exp \frac{\pi i}{\omega}(vm^2 + um),$$

where the summation extends to all positive and negative integer values of m, including zero. In fact, if we first write herein $u + 2\omega$ instead of u, then in each term the index of the exponential is altered by $\frac{\pi i}{\omega} 2\omega m, = 2m\pi i$, and the term itself thus remains unaltered; that is, $\theta\,(u + 2\omega) = \theta u$. But writing $u + 2v$ in place of u, each term is changed into the succeeding term, into the factor $\exp \frac{\pi i}{\omega}(u + v)$; in fact, making the change in question u into $u + 2v$, and writing also $m - 1$ in place of m, $vm^2 + um$ becomes $v\,(m-1)^2 + (u + 2v)\,(m - 1), = vm^2 + um - u - v$, and we thus have $\theta(u + 2v) = \exp \left\} -\frac{\pi i}{\omega}(u + v) \right\} . \theta u$. In order to the convergency of the series it is necessary that $\exp \frac{\pi i v m^2}{\omega}$ should vanish for indefinitely large values of m, and this will be so if $\frac{iv}{\omega}$ be a complex quantity of the form $\alpha + \beta i$, α *negative*; for instance, this will be the case if ω be real and positive and v be $= i$ into a real and positive quantity. The original definition of θ as a double product seems to put more clearly in evidence the real nature of this function, but the new definition has the advantage that it admits of extension to the θ-functions of two or more variables.

The elliptic functions sn u, cn u, dn u, have thus been expressed each of them as the quotient of two θ-functions, but the question arises to express conversely a θ-function by means of the elliptic functions; the form is found to be $\theta u = \mathrm{C} \exp\left(\mathrm{A}u^2 + \mathrm{B}\int_0\int_0 \mathrm{sn}^2\,u\,du^2\right)$, viz., θu is expressible as an exponential, the index of which depends on the double integral $\int_0\int_0 \mathrm{sn}^2\,u\,du^2$.

The object has been to explain the general nature of the elliptic functions sn u, cn u, dn u, and of the θ-functions with which they are thus intimately connected; it would be out of place to go into the theories of the multiplication, division, and transformation of the elliptic functions, or into the theory of the elliptic integrals, and of the application of the θ-functions to the representation of the elliptic integrals of the second and third kinds.

13. The reasoning which shows that for a doubly periodic function the ratio of the two periods 2ω, $2v$ is imaginary shows that we cannot have a function *of a single variable,* which shall be *triply* periodic, or of any higher order of periodicity. For if the periods of a triply periodic function $\phi\,(u)$ were $2\omega, 2v, 2\chi$, then m, n, p being any positive or negative integer values, we should have $\phi\,(u + 2m\omega + 2nv + 2p\chi) = \phi u$; ω, v, χ must be incommensurable, for if not, the three periods would really reduce themselves to two periods, or a single period; and being incommensurable, it would be possible to determine the integers m, n, p in such manner that the real part and also the coefficient of i of the expression $m\omega + nv + p\chi$ shall be each of them as small as we please, say $\phi\,(u + \epsilon) = \phi u$, and thence $\phi\,(u + k\epsilon) = \phi u$ (k an integer), and $k\epsilon$ as near as we please to any given real or imaginary value whatever. We have thus the nugatory result $\phi u =$ a constant, or at least the function if not a constant is a function of an infinitely and perpetually discontinuous kind, a conception of which can hardly be formed. But a function of two variables may be triply or quadruply periodic—viz., we may have a function $\phi\,(u, v)$ having for u, v the simultaneous periods $2\omega, 2\omega'$; $2v, 2v'$; $2\chi, 2\chi'$; $2\psi, 2\psi'$; or what is the same thing, such that m, n, p, q being any integers whatever, we have $\phi\,(u + 2m\omega + 2nv + 2p\chi + 2q\psi,\ v + 2m\omega' + 2nv' + 2p\chi' + 2q\psi') = \phi\,(u, v)$; and similarly a function of $2n$ variables may be $2n$-tuply periodic.

It is in fact in this manner that we pass from the elliptic functions and the single θ-functions to the hyperelliptic or Abelian functions and the multiple θ-functions; the case next succeeding the elliptic functions is when we have X, Y the same rational and integral sextic functions of x, y respectively, and then writing

$$\frac{dx}{\sqrt{\mathrm{X}}} + \frac{dx}{\sqrt{\mathrm{Y}}} = du,\ \frac{xdx}{\sqrt{\mathrm{X}}} + \frac{ydy}{\sqrt{\mathrm{Y}}} = dv,$$

we regard certain symmetrical functions of x, y, in fact the ratios of ($2^4 =$) 16 such symmetrical functions as functions of (u, v); say we thus have 15 hyperelliptic functions $f(u, v)$ analogous to the 3 elliptic functions sn u, cn u, dn u, and being quadruply periodic. And these are the quotients of 16 double θ-functions $\theta\,(u, v)$, the general form being

$$\theta\,(u, v) = \mathrm{A}\Sigma\Sigma \exp \{\tfrac{1}{2}(a, h, b,)\,(m, n)^2 + mu + nv\},$$

where the summations extend to all positive and negative integer values of (m, n); and we thus see the form of the θ-function for any number of variables whatever. The epithet "hyperelliptic" is used in the case where the differentials are of the form just mentioned $\frac{dx}{\sqrt{\mathrm{X}}}$, where X is a rational and integral function of x; the epithet "Abelian" extends to the more general case where the differential involves the irrational function of x, determined by any rational and integral equation $\phi\,(x, y) = 0$ whatever.

As regards the literature of the subject, it may be noticed that the various memoirs by Riemann, 1851–1866, are republished in the collected edition of his works, Leipsic, 1876; and shortly after his death we have the *Theorie der Abelschen Functionen*, by Clebsch and Gordan, Leipsic, 1866. Preceding this we have by MM. Briot and Bouquet, the *Théorie des Fonctions doublement périodiques et en particulier des Fonctions Elliptiques*, Paris, 1859, the results of which are reproduced and developed in their larger work, *Théorie des Fonctions Elliptiques*, 2 ed., Paris, 1875.

14. It is proper to mention the gamma (Γ) or Π function, $\Gamma(n + 1) = \Pi n, = 1.2.3. \ldots n$, when n is a positive integer. In the case just referred to, n a positive integer, this presents itself almost everywhere in analysis,—for instance, the binomial coefficients, and the coefficients of the exponential series are expressible by means of such functions of a number n. The definition for any real positive value of n was taken to be $\Gamma n = \int_0^\infty x^{n-1} e^{-x} dx$; it is then shown that, n being real and positive, $\Gamma\,(n + 1) = n\Gamma n$, and by assuming that this equation holds good for positive or negative real values of n, the definition is extended to real negative values; the equation gives $\Gamma 1 = 0\Gamma 0$, that is $\Gamma 0 = \infty$, and similarly $\Gamma(-n) = \infty$, where $-n$ is any negative integer. The definition by the definite integral has been or may be extended to imaginary values of n, but the theory is not an established one. A definition extending to all values of n is that of Gauss $\Pi n =$ limit. $\frac{1\ .\ 2\ .\ 3\ \ldots\ k}{n+1 . n+2 . n+3 \ldots n+k} k^n$, the ultimate value of k being $= \infty$; but the function is chiefly considered for real values of the variable.

A formula for the calculation when x has a large real and positive value, is $\Pi x = \sqrt{2\pi}\, x^{x+\frac{1}{2}} \exp\,(-x + \frac{1}{12x} + \ldots)$, or as this may also be written (neglecting the negative powers of x) $\Pi x = \sqrt{2\pi} \exp\{(x + \frac{1}{2}) \log x - x\}$.

Another formula is $\Gamma x \Gamma(1 - x) = \frac{\pi}{\sin \pi x}$, or as this may also be written, $\Pi(x - 1)\Pi(-x) = \frac{\pi}{\sin \pi x}$.

It is to be observed that the function Π serves to express the product of a set of factors in arithmetical progression, we have $(x + a)(x + 2a) \ldots (x + ma) = a^m\left(\frac{x}{a} + 1\right)\left(\frac{x}{a} + 2\right) \ldots \left(\frac{x}{a} + m\right) = a^m\Pi\left(\frac{x}{a} + m\right) \div \Pi\frac{x}{a}$. We can consequently express by means of it the product of any number of the factors which present themselves in the factorial expression of sin u. Starting from the form $u\Pi_1^m\left(1 + \frac{u}{s\pi}\right)\Pi_1^n\left(1 - \frac{u}{s\pi}\right)$, where Π is here as before the sign of a product of factors corresponding to the different integer values of s, this is thus converted into

$$n\Pi\left(\frac{u}{\pi} + m\right)\Pi\left(-\frac{u}{\pi} + n\right) \div \Pi\left(\frac{u}{\pi}\right)\Pi\left(-\frac{u}{\pi}\right)\Pi m \Pi n,$$

or as this may also be written—

$$\pi\Pi\left(\frac{u}{\pi} + m\right)\Pi\left(-\frac{u}{\pi} + n\right) \div \Pi\left(\frac{u}{\pi} - 1\right)\Pi\left(-\frac{u}{\pi}\right)\Pi m \Pi n,$$

which in virtue of

$$\Pi\left(\frac{u}{\pi} - 1\right)\Pi\left(-\frac{u}{\pi}\right) = \frac{\pi}{\sin u},$$

becomes

$$= \sin u\Pi\left(\frac{u}{\pi} + m\right)\Pi\left(-\frac{u}{\pi} + n\right) \div \Pi m \Pi n.$$

m and n are here large and positive, and calculating the second factor by means of the formula for Πx, in this case we have the before-mentioned formula

$$u\Pi_1^m\left(1 + \frac{u}{s\pi}\right)\Pi_1^n\left(1 - \frac{u}{s\pi}\right) = \left(\frac{n}{m}\right)^{\frac{u}{\pi}} \sin u.$$

The gamma or Π function is the so-called second Eulerian integral; the first Eulerian integral $\int_0^1 x^{p-1}(1-x)^{q-1}dx, = \Gamma p \Gamma q \div \Gamma(p+q)$, is at once expressible in terms of Γ, and is therefore not a new function to be considered.

15. We have the function defined by its expression as a hypergeometric series $\Gamma.(\alpha, \beta, \gamma, u) = 1 + \frac{\alpha.\beta}{1.\gamma} u + \frac{\alpha.\alpha+1.\beta.\beta+1}{1.2.\gamma+1.\gamma+2} u^2 + \text{etc.}$, *i. e.*, this expression of the function serves as a definition, if the series be finite, or if being infinite it is convergent. The function may also be defined as a definite integral; in other words, if in the integral

$$\int_0^1 x^{\alpha'-1}(1-x)^{\beta'-1}(1-ux)^{-\gamma'}dx$$

we expand the factor $(1-ux)^{-\gamma'}$ in powers of ux, and then integrate each term separately by the formula for the second Eulerian integral, the result is

$$= \frac{\Gamma\alpha'.\Gamma\beta'}{\Gamma(\alpha'+\beta')} + \frac{\Gamma(\alpha'+1).\Gamma\beta'}{\Gamma(\alpha'+\beta'+1)} \cdot \frac{\gamma'}{1} u + \text{etc.},$$

which is

$$= \frac{\Gamma\alpha'.\Gamma\beta'}{\Gamma(\alpha'+\beta')} \left\{ 1 + \frac{\alpha'.\gamma'}{\alpha'+\beta'.1} u + \frac{\alpha'.\alpha'+1.\gamma'.\gamma'+1}{\alpha'+\beta'.\alpha'+\beta'+1.1.2} u^2 + \ldots \right\},$$

or writing $\alpha', \beta', \gamma' = \alpha, \gamma-\alpha, \beta$ respectively, this is $= \frac{\Gamma\alpha\Gamma(\gamma-\alpha)}{\Gamma\gamma}\Gamma(\alpha, \beta, \gamma, u)$, so that the new definition is $\Gamma(\alpha, \beta, \gamma, u) = \frac{\Gamma\alpha\Gamma(\gamma-\alpha)}{\Gamma\gamma}\int_0^1 x^{\alpha-1}(1-x)^{\beta'-1}(1-ux)^{-\beta}dx$; but this is in like manner only a definition under the proper limitations as to the values of α, β, γ, u. It is not here considered how the definition is to be extended so as to give a meaning to the function $\Gamma(\alpha, \beta, \gamma, u)$ for all values, say of the parameters α, β, γ, and of the variable u. There are included a large number of special forms which are either algebraic or circular or exponential, for instance $\Gamma(\alpha, \beta, \beta, u) = (1-u)^{-\alpha}$, etc., or which are special transcendents which have been separately studied, for instance Bessel's functions, the Legendrian functions X_n presently referred to, series occurring in the development of the reciprocal of the distance between two planets, etc.

16. There is a class of functions depending upon a variable or variables x, y . . and a parameter n, say the function for the parameter n is X_n such that the product of two functions having the same variables, multiplied it may be by a given function of the variables, and integrated between given limits, gives a result $= 0$ or not $= 0$, according as the parameters are unequal or equal; $\int UX_m X_n \, dxdy \ldots = 0$, but $\int UX_n{}^2 dx$ not $= 0$; the admissible values of the parameters being either any integer values, or it may be the roots of a determinate algebraic or transcendental equation; and the functions X_n may be either algebraical or transcendental. For instance, such a function is $\cos nx$; m and n being integers, we have $\int_0^\pi \cos mx . \cos nx \, dx = 0$, but $\int_0^\pi \cos^2 nx \, dx = \frac{1}{2}\pi$. Assuming the existence of the expansion of a function fx, in a series of multiple cosines, we thus obtain at once the well-known Fourier series, wherein the coefficient of $\cos mx$ is $= \frac{1}{2}\pi \int_0^\pi \cos mx . fx \, dx$. The question whether the process is applicable is elaborately discussed in Riemann's memoir (1854), *Ueber die Darstellbarkeit einer Function durch eine trigonometrische Reihe*, No. xii. in the collected works. And again we have the Legendrian functions, which present themselves as the coefficients of the successive powers of α in the development of $(1-ax+\alpha^2)^{-\frac{1}{2}}$, $X_0 = 1$, $X_1 = x$, $X_2 = \frac{3}{2}(x^2 - \frac{1}{3})$, etc.: here m, n being any positive integers $\int_{-1}^1 X_m X_n dx = 0$, but $\int_{-1}^1 X_n^2 dx = \frac{2}{2n+1}$. And we have also Laplace's functions, etc.

Functions in General.

17. In what precedes a review has been given, not by any means an exhaustive one, but embracing the most important kinds of known functions; but there are questions to be considered in regard to functions in general.

A function of $x+iy$ has been built up by means of analytical operations performed upon $x+iy$, $(x+iy)^2 = x^2+y^2+i.2xy$, etc., and the question next referred to has not arisen. But observe that, knowing $x+iy$, we know x and y, and therefore any two given functions $\phi(x, y)$, $\psi(x, y)$ of x and y: we therefore also know $\phi(x, y) + i\psi(x, y)$, and the question is, whether such a function of x, y (being known when $x+iy$ is known) is to be regarded as a function of $x+iy$; and if not, what is the condition to be satisfied in order that $\phi(x, y) + i\psi(x, y)$ may be a function of $x+iy$. Cauchy at one time considered that the general form was to be regarded as a function of $x+iy$, and he introduced the expression "fonction monogène," monogenous function, to denote the more restricted form which is the proper function of $x+iy$.

Consider for a moment the above general form, say $x'+iy' = \phi(x, y) + i\psi(x, y)$, where ϕ, ψ are any real functions of the real variables (x, y); or what is the same thing, assume $x' = \phi(x, y)$, $y' = \psi(x, y)$; if these functions have each or either of them more than one value, we attend only to one value of each of them. We may then as before take x, y to be the co-ordinates of a point P in a plane Π, and x', y' to be the co-ordinates of a point P′ in a plane Π′. If for any given values of x, y the increments of $\phi(x, y)$, $\psi(x, y)$ corresponding to the indefinitely small real increments h, k of x, y be $Ah+Bk$, $Ch+Dk$, A, B, C, D being functions of x, y, then if the new co-ordinates of P are $x+h, y+k$, the new co-ordinates of P′ will be $x'+Ah+Bk$, $y'+Ch+Dk$; or P, P′ will respectively describe the indefinitely small straight paths at the inclinations $\tan^{-1}\frac{k}{h}$, $\tan^{-1}\frac{Ch+Dk}{Ah+Bk}$ to the axes of x, x' respectively; calling these angles θ, θ', we have therefore $\tan\theta' = \frac{C+D\tan\theta}{A+B\tan\theta}$. Now in order that $x'+iy'$ may be $= \phi(x+iy)$, a function of $x+iy$, the condition to be satisfied is that the increment of $x'+iy'$ shall be proportional to the increment $h+ik$ of $x+iy$, or say that it shall be $= (\lambda+i\mu)(h+ik)$, λ, μ being functions of x, y, but independent of h, k; we must therefore have $Ah+Bk$, $Ch+Dk = \lambda h - \mu k$, $\mu h + \lambda k$ respectively, that is A, B, C, D $= \lambda, -\mu, \mu, \lambda$ respectively, and the equation for $\tan\theta'$ thus becomes $\tan\theta' = \frac{\mu+\lambda\tan\theta}{\lambda-\mu\tan\theta}$; hence writing $\frac{\mu}{\lambda} = \tan\alpha$, where α is a function of x, y, but independent of h, k, we have $\tan\theta' = \frac{\tan\alpha+\tan\theta}{1-\tan\alpha\tan\theta}$, that is $\theta' = \alpha+\theta$; or for the given points (x, y), (x', y'), the path of P being at any inclination whatever θ to the axis of x, the path of P′ is at the inclination θ + constant angle α to the axis of x'; also $(\lambda h-\mu k)^2 + (\mu h+\lambda k)^2 = (\lambda^2+\mu^2)(h^2+k^2)$, *i. e.*, the lengths of the paths are in a constant ratio.

The condition may be written $\delta(x'+iy') = (\lambda+i\mu)(\delta x+i\delta y)$; or what is the same thing $\left(\frac{dx'}{dx}+i\frac{dy'}{dx}\right)\delta x + \left(\frac{dx'}{dy}+i\frac{dy'}{dy}\right)\delta y = (\lambda+i\mu)(\delta x+i\delta y)$, that is, $\frac{dx'}{dx}+i\frac{dy'}{dx} = (\lambda+i\mu)$, $\left(\frac{dx'}{dy}+i\frac{dy'}{dy}\right) = i(\lambda+i\mu)$; consequently $\frac{dx'}{dx}+i\frac{dy'}{dy} = i\left(\frac{dx'}{dx}+i\frac{dy'}{dx}\right)$; that is, $\frac{dx'}{dy} = -\frac{dy'}{dx}, \frac{dy'}{dy} = \frac{dx'}{dx}$, as the analytical conditions in order that $x'+iy'$ may be a function of $x+iy$: they obviously imply $\frac{d^2x'}{dx^2}+\frac{d^2x'}{dy^2} = 0$, $\frac{d^2y'}{dx^2}+\frac{d^2y'}{dx^2} = 0$; and if x' be a function of x, y, satisfying the first of these conditions, then $-\frac{dx'}{dy}dx + \frac{dx'}{dx}dy$ is a complete differential, and $y' = \int\left(-\frac{dx'}{dx}dx + \frac{dx'}{dx}dy\right)$.

18. We have in what just precedes the ordinary behavior of a function $\phi(x+iy)$ in the neighborhood of the value $x+iy$ of the argument or point $x+iy$; or say the behavior in regard to a point $x+iy$ such that the function is in the neighborhood of this point a *continuous* function of $x+iy$ (or that the point is not a point of *discontinuity*): the correlative definition of continuity will be that the function $\phi(x+iy)$, assumed to have at the given point $x+iy$ a single finite value, is continuous in the neighborhood of this point, when the point $x+iy$ describing continuously a straight infinitesimal element $h+ik$, the point $\phi(x+iy)$ describes continuously a straight infinitesimal element $(\lambda+i\mu)(h+ik)$; or what is really the same thing, when the function $(x+iy)$ has at the point $x+iy$ a differential coefficient.

19. It would doubtless be possible to give for the continuity of a function $\phi(x+iy)$ a less stringent definition not implying the existence of a differential coefficient; but we have this theory only in regard to the functions ϕx of a real variable in memoirs by Riemann, Hankel, Dubois Reymond, Schwarz, Gilbert, Klein, and Darboux. The last-mentioned geometer, in his "Mémoire sur les fonctions discontinues," *Jour. de l'École Normale*, t. iv. (1875) pp. 57–112, gives (after Bonnet) the following definition of a continuous function (observe that we are now dealing with real quantities only):—the function $f(x)$ is continuous for the value $x = x_0$ when h and ϵ being positive quantities as small as we please, and θ any positive quantity at pleasure between 0 and 1, we have for all the values of θ $f(x_0 \pm \theta h) - f(x)$ less in absolute magnitude than ϵ; and moreover $f(x)$ is continuous through the interval x_0, x_1

($x_1 > x_0$, that is, nearer $+\infty$) when $f(x)$ is continuous for every value of x between x_0 and x_1, and, h tending to zero through positive values, $f(x_0+h)$ and (x_0-h) tend to the limits $f(x_0)$, $f(x_1)$ respectively. It is possible, consistently with this definition, to form continuous functions not having in any proper sense a differential coefficient, and having other anomalous properties; thus if $a_1, a_2, a_3 \ldots$ be an infinite series of real positive or negative quantities, such that the series Σa_n is absolutely convergent (*i. e.*, the sum $\Sigma \pm a_n$, each term being made positive, is convergent), then the function $\Sigma a_n (\sin n\pi x)^{\frac{2}{3}}$ is a continuous function actually calculable for any assumed value of x; but it is shown in the memoir that, taking $x =$ any commensurable value $\frac{p}{q}$ whatever, and then writing $x = \frac{p}{q} + h$, h indefinitely small, the increment of the function is of the form $(k+\epsilon)h^{\frac{2}{3}}$, k finite, ϵ an indefinitely small quantity vanishing with h; there is thus no term varying with h, nor consequently any differential co-efficient. See also Riemann's Memoir *Ueber die Darstellbarkeit*, etc. (No. xii. in the collected works), already referred to.

20. It was necessary to allude to the foregoing theory of (as they may be termed) infinitely discontinuous functions; but the ordinary and most important functions of analysis are those which are continuous, except for a finite number (or it may be an infinite number) of points of discontinuity. It is to be observed that a point at which the function becomes infinite is *ipso facto* a point of discontinuity; a value of the variable for which the function becomes infinite is, as already mentioned, said to be an "infinity" (or a "pole") of the function; thus in the case of a rational function expressed as a fraction in its least terms, if the denominator contains a factor $(x-a)^m$, a a real or imaginary value, m a positive integer, then a is said to be an infinity of the m-th order (and in the particular case $m = 1$, it is said to be a simple infinity). The circular functions $\tan x$, $\sec x$ are instances of a function having an infinite number of simple infinities.

A rational function is a one-valued function, and in regard to a rational function the infinities are the only points of discontinuity; but a one-valued function may have points of discontinuity of a character quite distinct from an infinity: for instance, in the exponential function $\exp\left(\frac{1}{u-a}\right)$ where a is real or imaginary, the value $u\,(=x+iy) = a$, is a point of discontinuity but not an infinity; taking $u = a + \rho e^{\alpha i}$, where ρ is an indefinitely small real positive quantity, the value of the function is $\exp\left(\frac{1}{\rho} e^{-\alpha i}\right)$, $= \exp \frac{1}{\rho}(\cos\alpha - i \sin\alpha)$, which is indefinitely large or indefinitely small according as $\cos\alpha$ is positive or negative, and in the separating case $\cos\alpha = 0$, and therefore $\sin\alpha = \pm 1$, it is $= \cos\frac{1}{\rho} \pm i \sin\frac{1}{\rho}$ which is indeterminate. If instead of $\exp\frac{1}{u-a}$ we consider a linear function $\left\{A + B \exp\frac{1}{u-a}\right\} \div \left\{C + D \exp\frac{1}{u-a}\right\}$, then writing as before $u = a + \rho e^{\alpha i}$, the value is $= A \div C$, or $= B \div D$, according as $\cos\alpha$ is negative or positive. As regards the theory of one-valued functions in general, the memoir by Weierstrass, "Zur Theorie der eindeutigen analytischen Functionen," *Berl. Abh.* 1876, pp. 11–60, may be referred to.

21. A one-valued function *ex vi termini* cannot have a point of discontinuity of the kind next referred to; if the representative point P, moving in any manner whatever, returns to its original position, the corresponding point P′ cannot but return to its original position. But consider a many-valued function, say an n-valued function $x' + iy'$, of $x + iy$; to each position of P′ there correspond n positions, in general all of them different, of P′. But the point P may be such that (to take the most simple case) two of the corresponding points P′ coincide with each other, say such a position of P is at V, then (using for greater distinctness a different letter W′ instead of V′) corresponding thereto we have two coincident points (W′), and $n-2$ other points W′; V is then a branch-point (Verzweigungspunkt). Taking for P any point which is not a branch-point, then in the neighborhood of this value each of the n functions $x' + iy'$ is a continuous function of $x + iy$, and by what precedes, if P describing an infinitely small closed curve (or oval) return to its original position, then each of the corresponding points P′ describing a corresponding indefinitely small oval will return to its original position. But imagine the oval described by P to be gradually enlarged, so that it comes to pass through a branch-point V; the ovals described by two of the corresponding points P′ will gradually approach each other, and will come to unite at the point (W′), each oval then sharpening itself out so that the two form together a figure of eight. And if we imagine the oval described by P to be still further enlarged so as to include within it the point V, then the figure of eight, losing the crossing, will be at first an hour-glass form, or twice-indented oval, and ultimately in form an ordinary oval, but having the character of a twofold oval; *i. e.*, to the oval described by P (and which surrounds the branch-point V) there will correspond this twofold oval, and $n-2$ onefold ovals, in such wise that to a given position of P on its oval there correspond two points, say P_1', P_2', on the twofold oval, and $n-2$ points $P_3', \ldots P_n'$, each on its own onefold oval. And then as P describing its oval returns to its original position, the point P_1' describing a portion only of the twofold oval, will pass to the original position of P_2', while the point P_2' describing the remaining portion of the twofold oval will pass to the original position of P_1'; the other points $P_3', \ldots P_2'$, describing each of them its own onefold oval, will return each of them to its original position. And it is easy to understand how, when the oval described by P surrounds two or more of the branch-points V, the corresponding curves for P′ may be a system of manifold ovals, such that the sum of the manifoldness is always $= n$, and to conceive in a general way the behavior of the corresponding points P and P′.

Writing for a moment $x + iy = u$, $x' + iy' = v$, the branch-points are the points of contact of parallel tangents to the curve $\phi(u, v) = 0$, a line through a cusp (but not a line through a node), being reckoned as a tangent; that is, if this be a curve of the order n and class m, with δ nodes and κ cusps, the number of branch-points is $= m + \kappa$, that is, it is $= n^2 - n - 2\delta - 2\kappa$, or if $p, = \frac{1}{2}(n-1)(n-2) - \delta - \kappa$, be the *deficiency*, then the number is $= 2n - 2 + 2p$.

To illustrate the theory of the n-valued algebraical function $x' + iy'$ of the complex variable $x + iy$, Riemann introduces the notion of a surface composed of n coincident planes or sheets, such that the transition from one sheet to another is made at the branch-points, and that the n sheets form together a multiply-connected surface, which can be by cross cuts (Querschnitte), converted into a simply-connected surface; the n-valued function $x' + iy'$ becomes thus a one-valued function of $x + iy$, considered as belonging to a point on some determinate sheet of the surface: and upon such considerations he founds the whole theory of the functions which arise from the *integration* of the differential expressions depending on the n-valued algebraical function (that is, any irrational algebraical function whatever) of the independent variable, establishing as part of the investigation the theory of the multiple θ-functions. But it would be difficult to give a further account of these investigations.

The Calculus of Functions.

22. The so-called Calculus of Functions, as considered chiefly by Herschel and Babbage and De Morgan, is not so much a theory of functions as a theory of the solution of functional equations; or, as perhaps should rather be said, the solution of functional equations by means of known functions, or symbols,—the epithet known being here used in reference to the actual state of analysis. Thus for a functional equation $\phi x + \phi y = \phi(xy)$, taking the logarithm as a known function the solution is $\phi x = c \log x$; or if the logarithm is not taken to be a known function, then a solution may be obtained by means of the sign of integration $\phi x = c\int\frac{dx}{x}$; but the establishment of the properties of the function logarithm (assumed to be previously unknown) would not be considered as coming within the theory. A class of equations specially considered is where $\alpha x, \beta x, \ldots$ being given functions of x, the unknown function ϕ is to be determined by means of a given relation between $x, \phi x, \phi\alpha x, \phi\beta x, \ldots$; in particular the given relation may be between $x, \phi x, \phi\alpha x$; this can be at once reduced to equations of finite differences; for writing $x = u_n$, $\alpha x = u_{n+1}$, we have $u_{n+1} = \alpha u_n$, giving u_n, and therefore also x, each of them as a function of n; and then writing $\phi x = v_n$, $\phi\alpha x$ will be the same function of $n + 1$, $= v_{n+1}$, and the given relation is again an equation of finite differences in v_{n+1}, v_n, and n; we have thus $v_n, = \phi x$, as a function of n, that is of x. As regards the equation $u_{n+1} = \alpha u_n$, considered in itself apart from what precedes, observe that this is satisfied by writing $u_n = \alpha^n(x)$, or the question of solving this equation of finite differences is in fact identical with that of finding the n-th function $\alpha^n(x)$, where $\alpha(x)$ is a given function of x. It of course depends on the form of $\alpha(x)$ whether this question admits of solution in any proper sense; thus, for a function such as $\log x$, the n-th logarithm is expressible in its original function $\log^n x\,(= \log\log \ldots x)$, and not in any other form. But there are forms, for instance $\alpha x = \frac{a + bx}{c + dx}$, where the n-th function $\alpha^n x$ is a function of the like form $\alpha^n x = \frac{A + Bx}{C + Dx}$, in which the actual value can be expressed as a function of n; if α be such a form, then $\phi\alpha\phi^{-1}$, whatever ϕ may be, is a like form, for we obviously have $(\phi\alpha\phi^{-1})^n = \phi\alpha^n\phi^{-1}$. The determi-

nation of the n-th function is in fact a leading question in the calculus of functions.

It is to be observed that considering the case of two variables, if for instance $\alpha(x, y)$ denote a given function of x, y, the notation $\alpha^2(x, y)$ is altogether meaningless; in order to generalize the question we require an extended notation wherein a single functional symbol is used to denote two functions of the two variables, thus $\phi(x, y) = \alpha(x, y), \beta(x, y)$, α and β given functions; writing from shortness $x_1 = \alpha(x, y)$, $y_1 = \beta(x, y)$, then $\phi^2(x, y)$ will denote $\phi(x_1, y_1)$, that is, two functions $\alpha(x_1, y_1)$, $\beta(x_1, y_1)$, say these are x_2, y_2; $\phi^3(x, y)$ will denote $\phi(x_2, y_2)$, and so on, so that $\phi^n(x, y)$ will have a determinate meaning. And the like is obviously the case in regard to any number of variables, the single functional symbol denoting in each case a set of functions equal in number to the variables. (A. CA.)

FUNDS, FUNDING SYSTEM. See National Debt.

FUNEN. See Denmark.

FUNERAL RITES, ceremonies attending the burial, burning, or disposal otherwise of the dead.

The prevalent modes of disposal are very various. The rudest is that of certain nomadic tribes, who, from the exigence of their wandering life, simply expose their dead, unless the custom of some tribes in modern Guinea be still ruder, who, like the ancient Ichthyophagi, throw their dead into the sea, and think they have thus got rid of corpse and ghost together. In exposing the dead, various rules prevail: some leave them where they die and move their own camp on to other hunting grounds; others, like the Wanyamwesi, carry them a little distance into the forest and leave them to be devoured by beasts of prey; while others still, like the Kamtchadales, refine upon this practice, and keep special dogs for the purpose of consuming the dead, reconciling themselves to this custom by the doctrine that they who are eaten by dogs here will drive fine dogs in the other world. Probably the straits of war explain the practice of the Latookas of Zanzibar, who bury their dead, but make it a rule to leave those slain in battle to be devoured by wild beasts where they lie. The custom of exposure has survived among cultured nations in the case of the Parsees, who bring their dead to certain round towers, called towers of silence, to be eaten by vultures which make these towers their dwelling-places. There is evidence that a more startling mode of disposal still is sometimes practised. Certain tribes of the ancient Scythians are said to have eaten their dead, and Burton says that at Dahomey the body of a person killed by lightning is not buried like others, but is hacked in pieces and eaten by the priests. Skertchley says they do not actually eat it, but only make believe to do so; but the make-believe is probably a survival of what was once the reality.

Next to exposure, burial is the simplest method of disposal, and it is the most widespread, being common alike to the lowest and the highest forms of culture. Burial likewise has its varying customs, from laying the body in natural holes or caves to erecting over it majestic temples. A common practice is simply to lay the body out on the ground and pile stones, or, as among the Moors, prickly thorns, over it, to keep off beasts. The use of the coffin is no sure test of culture, for while some of the rudest peoples lay the dead in a hollowed trunk or a boat, the Mahometan nations use nothing of the kind. Nor is the possession of fixed burying places a better index to the stage of development, for while many primitive tribes have stated burial places, the more advanced Mexicans had none. Some American tribes bury their children in a separate graveyard from adults, and others bury them by the wayside that their souls may enter into persons passing by.

Refinements upon ordinary burial are the practices of first burning the dead, or embalming them, or drying them on trees or artificial scaffolds, before burying them. That plain burial is the earlier custom, and that these other more elaborate and costly fashions are later engraftments upon it, seems to be proved by the fact that many nations adopt more than one custom, and that, while they only bury their women, they first burn or dry their men. The ancient Colchians suspended the corpses of men in trees, but their women they buried. The Gonds and Bhils of India, who have adopted under Hindu influences the practice of burning, still bury their women, while the Todas burn all now except children the victims of infanticide, whom they bury. The Muddikers, who bury, burn lepers, probably from sanitary reasons; and certain tribes who burn bury the lightning-struck on the spot where they fall. The Kalmucks follow all modes: their usual custom is exposure; but they also burn, or bury, or throw the corpse into the water, or under a heap of stones, or build a hut over it, according to what the priest declares to be most suitable to the condition of the deceased.

Another point of interest in burying is the position of the body in the grave. Some bury their dead lying, others sitting, and there is a remarkable consensus of custom for the practice of laying the body east and west, sometimes with the head to the east and sometimes to the west. This custom is evidently due originally to solar symbolism, and the head is turned to the east or to the west, according as the dead are thought of in connection with the sunrise, the reputed home of deity, or with the sunset, the reputed region of the dead. This practice, however, though nearly universal, is not absolutely so, for some tribes lay their dead north and south; and others, like the Bongos, bury men with the face to the north and women with the face to the south; while if one of the Wanyamwesi in Africa happens to die abroad, he is buried facing his native village.

The necessary act of disposing of the corpse has always been accompanied by ceremonies expressive (1) of affection for the deceased or grief for his loss; (2) of present interest in and solicitude for his welfare; (3) of a certain mysterious fear of him in his present state; and (4) of affectionate remembrance of him. These ceremonies vary much under different changes of culture, yet have all the same central elements.

Among primitive nations the most common ceremonial expressions of grief are simple exaggerations of the natural expressions of the emotions,—a carelessness as to usual comforts, and a positive distracting agony. Fasting, neglecting the hair, wearing rags or sackcloth, sitting in ashes, daubing one's self with mud or pigment, are almost universal examples of the one; while wringing the hands, tearing the hair, shaving the head, beating the breast, are common examples of the other. The New Zealanders daub themselves with red pigment and gash their bodies with broken shells. The Hawaians gash themselves, knock out front teeth, cut off a finger joint or an ear, and on the death of a king the nation feigns universal madness, and murders, robs, and commits all manner of crimes, as a ceremonial expression of a sorrow which has driven them frantic. Singing laments, playing plaintive music, dancing funeral dances, are not unusual expressions of grief, though it is probable that the music continuously kept up at the wakes of the Celts and other nations was meant to ward off evil spirits.

The most interesting funeral rites, however, are those which express men's ideas of the present state, and their solicitude for the present welfare, of the deceased. There is no nation which does not believe that the soul continues to exist after its separation from the body, in another world like the present, but invisible. Many of the funeral rites of the nations are determined by the belief that death is a journey of the soul from this world to that other, and are meant to provide necessary entertainment for the dead on the way, or even after arrival. Meat, drink, weapons, light, musical instruments, horses, money, servants, wives, are among the most usual things buried with the body. The Gonds even leave toothpicks with it. The Aztecs laid a waterbottle beside the dead to be used on the way to Mictlan, the land of the dead. The North American Indian buries with the dead a kettle and provisions, bow and arrows, a pair of moccasins, with a spare piece of deerskin to patch them if they wear out, and sinews of deer to sew the patches on with. The Laplanders lay beside the corpse flint, steel, and tinder to supply light for the dark journey. The Chippewas light fires on the grave for four nights after the funeral, for guidance on the journey, which they think lasts four days. The Karens give the deceased at the grave explicit instructions as to the relations of things in space being reversed in the next world. Taking a stick, they throw it to the north and say that it is the south, and taking another, they throw it to the south and say that is the north. The Mexicans gave several slips of paper to the deceased, to serve as passports, taking him in succession past a precipice, a serpent, and a crocodile. The obolus which the Greeks put in the dead man's mouth to pay Charon, and the coin the Irish place in his hand, are well known. It is a fine touch of the Greenlanders to bury with a child a dog to guide him, for they say a dog will find his way anywhere. The North American Indian buries his "medicine" with him to take him to the happy hunting-grounds. The Norse warrior had his horse and armor laid in the grave with him that he might ride to Valhalla in full panoply.

Graver sacrifices, of animals, wives, and slaves, for the permanent use of the deceased in the next world, have prevailed at one period or another among most nations of Asia, Africa, and America. They are conspicuously absent from the Semitic peoples, though even among them a trace is found in the Arab custom of leaving the dead man's camel to die on his grave. Of human funeral sacrifices, Hindu suttee is the best known instance. The Fijians strangle wives, slaves, and friends to attend the deceased. The Dyaks of Borneo make head-hunting a main business of this life, under the impression that every person whose head they secure will serve them in the next. A kind of suttee by symbol still survives in certain nations when the sacrifice itself is abolished. The Chinese make paper images of sedan bearers and the like, and fly them in the wind over the grave, thus despatching them after the dead man to serve him; and the Japanese, with whom at one time it was the custom for 20 or 30 slaves to kill themselves by "hari-kari" with the dead, substitute images in modern times; and the Quakeolths of North America rested the widow's head on the burning corpse, and then dragged her out half dead. Treasure buried with the dead was meant also for their use. In Madagascar as much as 11,000 dollars were laid in the tomb of a prince. The principle that lies at the root of those sacrifices is the prevalent belief in object souls as well as animal souls. The soul of the warrior rode upon the soul of his horse, and wielded the soul of his weapon.

Many of the primitive funeral rites seem dictated by a certain awe or fear of the ghost, and a wish to get it well away. Lane mentions a practice among modern Egyptians of turning the corpse round and round so as to make it giddy, that it might not know where it was going. For the same end, apparently, the Santals carry the body three times round the pile. The Karens walk round the bier in opposite directions three times, each time exchanging candles they have in their hands, and then bid the ghost depart in peace, and to make more sure of his departure, destroy the village where the death occurred. From a similar desire to confuse the ghost, the Greenlanders take the body out by a window instead of the door, and the Siamese break out a new opening in the wall to take it through, and then carry it three times round the garden. The Siberians fling a red-hot stone after the corpse, and the Brandenburg peasants pour out a pail of water after it, to prevent it returning. The Pomeranians leave some straw behind in the graveyard that the soul may rest contented there; while the Bongos on leaving the burial place shoot arrows at a votive stake they erect on the grave, and leave the arrows sticking in the wood. The Australians take off the nails of the corpse and tie its hands, lest it scrape its way out again.

The affectionate commemoration of the deceased takes many forms, from simply mourning for a definite period up to periodical funeral feasts, the erection of memorial images, the preservation of the relics as instruments of superhuman power, and the worship of the Manes. The natives of Dahomey keep up intercourse with the departed by killing a slave from time to time, whose soul is supposed to go to the dead with the news of the living. The Guinea negroes used to keep the bones of their friends in chests and go occasionally and hold conversation with them. The Mandan women in North America take food year by year to their dead kinsfolk, whose skulls have been preserved in circles of 100 on the prairie. Funeral feasts prevail extensively in America, Africa, and Asia, and arise partly, like our own anniversary dinners, from a simple desire to do honor to the dead, but partly also from the belief that the dead participate in the good cheer. They are not merely commemorative but communion meals. Funeral games were probably, like the elaborate dressing of the dead in Brazil and other places in the robes of their patron saints or deities, merely designed to show respect.

To come now to the more cultured peoples, the Greeks either buried or burnt their dead. The body was anointed, crowned with flowers, dressed handsomely and usually in white, laid out in a bed of state with an obolus in its mouth for Charon and a honeycake for Cerberus. These offices were performed by the female relations. The kinsfolk gathered round the bed, and lamented and tore their clothes and hair. On the third day after death the body was carried out by the friends in a coffin, usually of earthen ware, before sunrise,—men walking before it, women, attended by the hired mourners, behind,—and was buried outside the town. A monument with inscription was raised over the grave. All who took part in the funeral needed to be purified before they could again enter the temple of the gods. Funeral sacrifices were offered on the third, ninth, and thirtieth days after. On the last of these days stated mourning ended, and the relatives might appear in public again. It was customary afterwards to visit the tomb and leave garlands, and burn meals as offerings to the dead.

The Roman ceremonies were analogous. Burial was the earlier custom. Burning was not general till the republic, but was universal under the empire; the preparation of the body for burial or cremation was performed by a hired body called *pollinctores.* The corpse was dressed in its best,—if a magistrate, in official robes; and if he had while alive been crowned, then wearing the crown. In early times the burial took place at night, but in later times this was the practice only of the poor who could not afford a funeral display. On the eighth day the body was carried to the grave in a stone coffin on a wooden—or in some cases a golden—bier, amid music and lamentation, and sometimes mimic representations of the life and merits of the deceased by professional players. The sons of the deceased went veiled, and the women beat their breasts. When the body was burned, oil, perfumes, ornaments, and everything supposed to be agreeable to the deceased, were thrown into the fire. On returning from the funeral friends were purified by sprinkling themselves with water or stepping over a fire. Mourning lasted nine days, and on the ninth a funeral sacrificial feast was celebrated, sometimes with games and gladiatorial combats.

The funeral rites of ancient Egypt were too elaborate to be described here. Their chief peculiarities were the embalming of the body and the judgment of the dead before burial. It is an error to suppose the embalming took place in order to preserve the body for a future state, for there is no evidence that the Egyptians believed in the resurrection of the body, and embalming could not have reference to that belief if they did, for the whole body was not preserved, but some of the most important internal parts were taken out first; besides, they embalmed not only men, but the lower animals also. The mummy was often kept in the house a whole year before being buried, and during that interval feasts were held in honor of the dead, and the tomb was being prepared. Then the case was taken out, set on a hearse, taken by a sledge to the sacred lake of the nome, across which it was carried in a boat by a boatman called Charon, and then deposited in the tomb on the other side. Before being allowed to cross, however, the judgment of the dead took place before forty-two judges summoned for the purpose; any one was allowed to bring forward any accusation against the deceased, and if he had led an evil life burial was refused. If there was no accusation, then the relatives ceased lamenting and pronounced encomiums, enlarging not on his descent, as among the Greeks, but on his personal merits. The denial of burial was not perpetual, however, its duration being measured by the extent of the crimes of the deceased. A gold or silver plate was put into the mouth of the mummy, not as a fee to the ferryman, but as a passport or certificate of good character.

The Russians have a similar custom of putting a passport (in their case a paper one) into the hand of the deceased as a testimonial of his virtue, to be shown to Peter at the gate of heaven. More curious still are the custom of the Badages of the Nilgherry Hills, who let loose a scape calf at the grave to take away the dead man's sins, and the practice mentioned by Brand as prevailing in Wales at one time, of employing sin-eaters, men who receive a loaf over the corpse, and eating it take upon them all the sins of the deceased.

The Mahometans bury their dead usually on the day of death. The prophet forbade wailing, but this prohibition is generally neglected. Even hired wailing women are employed by some, who wail during all the time the corpse is in the house and on the way to the grave; parts of the Koran are recited by religious officials in the house. In the funeral procession the male relatives go in front of the bier, and are preceded by four or six poor old men, mostly blind, who chant the profession of faith, and followed by four or six schoolboys who chant passages from a poem descriptive of the last judgment; while the female relatives come behind the bier, accompanied by the wailing women with their tambourines, and cry and shriek, and celebrate the praises of the deceased. If the dead man was rich, then several camels follow bearing bread and water to give the poor at the tomb, and last of all comes a buffalo to be slaughtered there for the same purpose. The bier is then brought to the mosque, laid in the usual place of prayer, with the right side towards Mecca; and the imam standing at its left side, with the people behind him, recites the funeral service, after which he calls upon those present to give their testimony respecting the dead, and they reply, "He was of the virtuous." The body is then laid in the tomb, and is there instructed in the answers to be given to questions, such as Who is God, and Who is his apostle? which the angels are expected to put.

Christian rites are marked by high reverence for the body, due to the belief in its future resurrection. Under Christian influence cremation gradually disappeared from Europe, northern and southern alike, and burial became universal, as being more expressive of the truth held so precious. Christians bury in separate places of their own, which, except among Presbyterians and other sections of Protestants, have been usually consecrated for the purpose by a special ceremony. Interment in churches of favorite martyrs and apostles was at one time much sought after, and had to be repeatedly forbidden by ecclesiastical councils. Bishops and distinguished churchmen or laymen were sometimes allowed to be buried in the church, only not near the altar. Among the early Christians the washing and anointing of the body for the burial were not done by hired persons, but were counted a work of love, done by friend for friend, and by the charitable for the poor and the stranger. The body was swathed in white, decked sometimes with the insignia of office or personal ornaments, placed in a coffin and laid out in the church or in the chamber of death for friends to come and take a last look at it. Three or four days usually elapsed between the death and burial, and vigils were held with prayers and hymn-singing. Hired mourners were forbidden. The funeral took place by day, for, Christian death being a victory, it was meant to give the procession the aspect of a triumph; for which reason those who took part in it carried branches, not of cypress, as among the Romans, but of palm and olive. Evergreen leaves were strewn on the coffin, but the practice of crowning the head with wreaths was forbidden, as savoring of idolatry. Lamps and torches, however, were sometimes carried. The body was borne on a bier and covered with a pall costly in proportion to the rank of the deceased. It was laid in the grave with face upward and feet to the east, in token of the resurrection at the coming again of the Sun of Righteousness. A service took place at the grave, and, as a rule, does so still among most Christians. In Scotland this was abolished at the Reformation, as being liable to be mingled with superstitious ideas, and a service and exhortation in the church were recommended instead, but this is seldom practised. Christian burial in consecrated ground, and with a religious service, was denied by canon law to all who were not Christians, to excommunicated persons, suicides, criminals, usurers, schismatics, heretics, and, among Roman Catholics, even unbaptized children of Christian parents. The eucharist was celebrated at the grave as early as the fourth century; and for some centuries, in spite of repeated prohibition by ecclesiastical councils, the practice prevailed in West Africa, Gaul, and the East, of placing the consecrated bread itself, steeped in wine, in the lips of the dead. Another practice, which has indeed the sanction of Basil, was not uncommon, that of burying the eucharistic bread with the dead. Special prayers were offered for the soul of the departed, and the priests, and afterwards other friends, gave the corpse the last kiss of peace. See CREMATION.

For descriptions of the funeral rites of different nations the reader may be referred to general works on ethnography, such as Dr. Robert Brown's *Races of Mankind;* Herbert Spencer's *Descriptive Sociology;* Prichard's *Researches into the Physical History of Man;* Fr. Müller's *Allgemeine Ethnographie;* Waitz's *Anthropologie der Natur-Völker;* Klemm's *Allgemeine Culturgeschichte der Menzchheit;* and more particularly to Porcacchi, *Funerali antichi di diversi populi e nationi*, Ven., 1754; Muret, *Cérémonies funèbres de toutes nations*, Paris, 1677 (English translation by Lorrain, 1683); Feydeau, *Hist. générale des usages funèbres et des sépultures des peuples anciens*, Paris, 1858, 3 vols.; De Gubernatis, *Storia popolare degli usi funebri Indo-Europei*, 1873; Tegg, *The Last Act*, London, 1876; and Sonntag, *Die Todtenbestattung*, Halle, 1878. For the funeral customs of the Bengal tribes reference may be made to Dalton's *Ethnology of Bengal;* for those of the American races, to Bancroft's *Native Races of the Pacific States of America;* and for interpretations of funeral rites, to Tylor's *Primitive Culture*, vol. ii., and Spencer's *Principles of Sociology*. Spencer not only treats of the origin and meaning of funeral rites, but strives to deduce all religious ideas and institutions out of those rites as their original source. For classical rites see Guichard, *Funérailles . . . des Romains, Grecs*, etc., Lyons, 1581; Meursius, *De Funere Grecorum et Romanorum.* Hague, 1604; Gutherius, *De Jure Manium*, Paris, 1613; Kirchmann, *De funeribus Romanorum*, Hamburg, 1605; Stackelberg, *Die Gräber der Hellenen*, Berlin, 1837; and Becker's *Charicles* and *Gallus;* and for early Christian rites, Gretser, *De Funere Christiano*, Ingoldst., 1611; Durand, *Rationale Divinorum Officium*, composed in the 13th century, and first published at Mainz, 1459; Bingham's *Antiquities of the Christian Church*, book xxiii.; and Augusti's *Christliche Archæologie*, Bd. ix. For English ceremonies see Agard, Dethick, Holland, etc., "On antiquity of ceremonies used at funerals," in Hearne's *Collection;* Brand's *Popular Antiquities;* Strutt's *Manners and Customs*. Weinhold has treated of early German customs in *Die heidnische Todtenbestattung in Deutschland*, Vienna, 1859. (J. R.)

FÜNFHAUS, Fünfhäusel, formerly Hangendenlissen, a flourishing and populous suburb to the south-west of Vienna, forming, along with Sechshaus proper and Rudolfsheim, the commissariat of Sechshaus, and trending in a westerly direction towards Schönbrunn. The principal manufactures are silk, satin, velvet, and cotton fabrics. Hangendenlissen was a village belonging to the Barnabite college of St. Michael at Vienna. The population, which in 1869 numbered 27,065, had increased in 1872 to 36,388.

FÜNFKIRCHEN, Hung. *Pécs*, a royal free city of Hungary, capital of the vármegye or county of Baranya, is situated on the declivity of Mount Mecsek, and on the railway to Mohács, 105 miles S.S.W. of Buda, 46° 6′ N. lat., 18° 13′ E. long. It is one of the oldest and finest towns in Hungary, and is the seat of a bishop and of the county administration. It consists principally of a public square, and a main street extending about five miles in length. Amongst the noteworthy buildings are the cathedral, said to have been founded by St. Stephen of Hungary in 1009, and reputed to be the oldest church in the kingdom, the bishop's palace, the county and town halls, several churches and monasteries, a public hospital, the theatre, an ecclesiastical seminary, a high-class gymnasium, and other educational establishments. Fünfkirchen has manufactories of woollen cloth, flannels, rosoglio, oil, leather, and paper, and also carries on a considerable trade in tobacco, gall-nuts, and wine. The population in 1870 amounted to 23,863, chiefly Catholics; by nationality the greater number are Magyars, the remainder Germans and Croatians. In former times Fünfkirchen was of much greater relative importance than at present. According to tradition it existed in the time of the Romans. In the Frankish-German period it was known under the name of Quinque Ecclesiæ; its bishopric was founded in 1009; in 1543 it was taken by the Turks, who retained possession of it till 1686. On the 18th June, 1849, it was occupied by the Austrians under General Nugent.

FUNGUS (Gr. μύκης, whence are derived *mycetes*, employed as a termination to the names of certain orders of fungi, and also the term *mycetology*, or more commonly *mycology*, the science of fungi) is the name applied to a distinct class of cellular cryptogams or *Thallophyta*. Though as plants the class is well marked by the invariable absence of chlorophyll, and consequently of the physiological phenomena attending its presence and action, it is not so at some points, where a dubious border exists between it and the lower members of the animal kingdom.

The vegetative body or thallus of fungi consists of filiform, cellular elements called *hyphæ*. In one group, the *Phycomycetes*, the hypha usually consists of a single densely branching cell; but in most cases it is composed of a series of cells placed end on end. These hyphæ ramify laterally much more frequently than dichotomously, and the usual mode of growth is by an apical cell which divides transversely; but in the bodies of the larger fungi intercalary growth also occurs (as in *Rhizomorpha subterranea*). A single hypha forms the complete thallus of the simpler fungi called *Hyphomycetes*, *Haplomycetes*, etc., but the bodies of the larger (compound) fungi are composed of a colony of hyphæ, usually densely interwoven, more rarely running in parallel lines, but always more or less firmly adhering together. In many fungi (as in the stalk of the *Phalloideæ*, the pileus of *Russula*, and *Lactarius*, in *Sclerotia*, and in the *peridia* of the *Lycoperdaceæ*) the fully developed tissue consists of polyhedral cells, closely packed, and bearing resemblance to *parenchyma*. This texture, however, consists of ordinary hyphæ, which, through pressure from adjacent parts, have been forced to assume this form. It bears the name of *pseudo-parenchyma*.

The *Myxomycetes* are the only large group of organisms usually classed with fungi which cannot be described as consisting of hyphæ. These differ in so many ways and so widely from any fungal or indeed vegetable structures that a separate consideration of their position is necessary (see Order V.). Other exceptions of a minor nature have been made of such organisms as *Hormiscium*, *Cryptococcus*, etc., but it is now the general belief that these are merely reproductive bodies of more perfect fungi. The cells of fungal hyphæ are of many shapes, but the usual one is long and cylindrical, and the other shapes are more or less modifications of this. The structure and growth of the fungal cell agree in general with those of the vegetable cell as it occurs elsewhere. At the same time no group in the vegetable kingdom exhibits so many minor divergent histological characters—a condition which serves to mark its boundaries as a class of vegetables with great distinctness.

The Cell-Membrane.—In the numerous fungi which develop rapidly and have a short existence in the adult state, the cell-wall is thin, tender, and structureless; but when a plant of this kind is accidentally checked in its expansion, the result is the production of thick homogeneous, unstratified membranes. On the other hand, the cell-wall of the more persistent species early acquires considerable thickness which, in the adult state, often so increases that the cell has the appearance of a solid cylinder. These thick membranes vary from a woody to a gelatinous consistency, and are composed sometimes of more than one layer. In the *Polyporei*, *Thelephora*, *Bovista*, *Geaster*, *Tulostoma*, etc., the cell-walls often exhibit (either after simple immersion in water or on the application of chemical reagents) at least two layers, the outer firmer and often colored, the inner softer and clearer. The cohesion of the filaments in these larger plants is brought about by their being densely interwoven, and also by the firm union and to a certain extent the amalgamation of the outer layers of the membranes. Spiral and ring-shaped thickenings are to be found in the capillitium cells of *Batarrea* and *Podaxon carcinomatis*, and pits are of constant occurrence in corresponding cells of the *Lycoperdaceæ*, and in the filaments which bear the fructification of *Dactylium*.

Chemical analyses of the cell-membrane show that it possesses the elementary constituents of cellulose; but since the uncolored and unthickened membrane does not commonly exhibit the characteristic reaction of cellulose towards iodine (neither simply nor after treatment with potash or Schultz's mixture), nor towards many of the reagents commonly employed in testing typical cellulose, it is necessary to apply to it the special term *fungal cellulose*. In several special cases, however, typical cellulose is known to exist. The membranes of old cells frequently undergo a kind of lignification, and in this condition offer extraordinary resistance to such treatment as that with concentrated sulphuric acid.

The Cell-Contents.—The protoplasm of fungal cells has no special quality of importance to distinguish it from that of other vegetable cells. Professor Sachs states (*Bot. Ztg.*, 1855) that under his observation the apices of growing hyphæ seemed to consist of one mass, in which the membrane could not be distinguished from the protoplasm; but Professor de Bary (*Morp. u. Physiol. der Pilze*, etc.), on the other hand, finds that the same conditions as exist in similar situations in other plants obtain here, viz., a dense mass of protoplasm enclosed by a tender membrane—an experience endorsed by most mycologists. The existence of a nucleus was long denied, and indeed its presence in the cells of the thallus has not yet been proved; but in the reproductive organs, where it had long been overlooked, its occurrence is not uncommon. Attempts to prove its existence in the cells of the thallus have not been wanting, but as yet with apparently no success: Schacht's observations on this head are notably untrustworthy, since there is no doubt that he confounded the true nucleus in other fungal cells with drops of oil and such bodies. The formation of vacuoles takes place as in other vegetable cells. Oleaginous matter is present, often abundantly, in nearly all fungi, in the form of drops of various sizes. Water (cell-sap) is necessarily present, though the quantity varies considerably without serious injury to the plant. A good proof of this variation is to be found in the expansion or contraction of the filaments of many *Hyphomycetes* according to the supply of water. In fungi with firmer cell-membranes, air-bubbles take the place of the water which has evaporated, and the contraction of the hyphæ is very inconsiderable.

The fungal cell is wholly destitute of chlorophyll, and it may be safely stated, of starch also. Schlossberger and Döpping record their detection of starch granules in the extracted sap of *Cantharellus cibarius;* but from their method of investigation it is highly probable that these were accidentally present.

The pigments of various colors to be found in many fungi are perhaps in most cases properties of the cell-membrane. Another class of them is peculiar to the cell-contents, and a third seems to pervade both membrane and contents. Those peculiar to the contents are mostly of an oleaginous or resinous nature, and their occurrence is in the form either of minute particles distributed throughout the protoplasm, or of larger drops or granules scattered irregularly among the contents. From the pigments peculiar to the fungal cell there are to be distinguished those absorbed in an unaltered state from the substratum. An instance of this is to be found in *Peziza æruginosa*, which owes it color to the abnormally greenish wood on which it grows. It was long thought that the *Peziza* was the cause of the green color, but a sufficient proof is contained in the facts that the wood is more frequently found green without any trace of the fungus than with it, and that the upper part of the fungus is sometimes uncolored when the lower portion has become green. Moulds, and other fungi usually colorless, are occasionally stained with the color of an unusual substratum. The subject of the pigments of fungi is one of which our knowledge is very incomplete.

Crystals of calcium oxalate are to be met with on the surfaces and in the intercellular spaces of many of the larger fungi; but in only two cases have they been found in the interior of the cell (*Phallus caninus* and *Russula adusta*). Cell-division takes place in the same way as in other plants.

The *mycelium* is the part of the thallus devoted to the functions of absorbing and storing nutriment. It consists of hyphæ developed directly from the germinating filaments, but often on further growth intricately bound up (frequently anastomosing) with each other, usually in amorphous masses, but sometimes in more or less definite bodies. In the larger fungi a number of hyphæ (in which case they run parallel to each other) are sometimes associated into bundles, like rootlets. The mycelium not unfrequently persists for several years. Mycelia in general bear so strong a resemblance to each other that it is usually impossible to determine the species to which they belong on their own characters.

A number of parasitic fungi possess peculiar organs called *haustoria*, which perform the function of extracting nourishment, and when necessary retaining the plant in its position. These are lateral branches of the mycelial hyphæ of various shapes and sizes. In *Erysiphe*, the mycelium of which creeps over the surface of its host plant, the haustoria are emitted abundantly from the side of the hyphæ next the epidermis, into which they penetrate and cause decay. They are in this case small and irregular in shape. On the *Peronosporeæ*, the mycelium of which inhabits usually the intercellular spaces of living plants, haustoria are frequently present. In some cases, as in *Cystopus candidus*, they have the form of minute stalked globules, but in most other *Peronosporeæ* they are irregular filamental protuberances, frequently branching to such an extent as almost to fill the affected cell.

Sclerotia are tuberous bodies composed of densely interwoven mycelial hyphæ enclosed by a layer of pseudo-parenchyma. They are specific in occurrence, like the bulbs and tubers of phanerogams, and are situated on or beneath the surface of the substrata—the ground or parts of plants. They were long regarded as independent forms of fungi, but it has been discovered that they are only resting states in which nourishment is stored up. They vary much in size.

The Receptacle.—On the mycelium there arises a body called the receptacle, the function of which is to bear the reproductive bodies, the spores. It varies much in size in different fungi; in most cases it forms the greater part of the whole thallus, and in others it consists of a simple or branched hypha. The same species of fungus may possess more than one kind of receptacle, either in different generations, or arising subsequently from the same mycelium. According to their structure receptacles may be divided into two groups, viz., those which consist of one hypha, and those which, composed of aggregated hyphæ, form a compound body. In certain cases the receptacle is entirely suppressed (as in the interstitial oogonia of the *Peronosporeæ*). When the receptacle consists of a simple or branched hypha, the spores are borne terminally. The sporophorous hyphæ are branches of the mycelium, rising usually vertically from it, and themselves frequently so characteristically branched as to afford means of generic and specific distinction. After bearing the first spore, the sporophore may again grow for a short space before bearing another. In compound receptacles the fructiferous hyphæ form together expansions called *hymenia*, from which the individual fertile branches arise. If the hymenium is formed upon the exterior surface of the receptacle it is termed *gymnocarpous*, and if within the receptacle *angiocarpous*. The hymenium never produces any but asexual spores.

Reproduction.—The reproduction of fungi is effected by both sexual and asexual means—the latter being far the more frequent of the two. No one species is known to possess more than one form of sexual reproduction, though it is frequently the case that more than one kind of asexual reproduction belongs to it. In many fungi no sexual reproduction is known to exist, but it is generally believed that in such cases the plants are merely members of a cycle of generations, the other stages in their life-history being unknown or unrecognized. The term *spore* is applied to all reproductive bodies, whether asexual or the product of the union of sexual cells. Discussion has frequently been engaged in as to the propriety of employing the same term to denote both kinds of bodies; but though in isolated cases the use of new terms has been advised, no satisfactory system of nomenclature has been established. There is, however, no doubt that some distinction ought to be made.

Sexual reproduction is effected by the union of two cells of different nature, which in themselves are incapable of further development. In the usual forms these cells are apparently of different nature, but in the phenomenon of conjugation the difference in the sexual elements is not determinable, though doubtless existing within the molecular sphere. The product of the union of sexual cells is developed into an organ of reproduction which, at the proper time, fulfils its office by giving rise either to a new mycelium directly or to a receptacle. These organs of reproduction bear names more or less expressive of their nature, such as *zygospore*, *oospore*, etc.

In those fungi of which the life-cycle is known, several different kinds of asexually produced spores have been observed. In only one group, the *Phycomycetes*, are motile spores (*zoospores*) known. In all other cases they are produced either at the apex of a *basidium* (*basidiospores*) or similar sporophore (*conidia*, etc.), by cell-division, or within an *ascus* by free cell-formation (*ascospores*). In *compound* or *septate* spores, which are multicellular, each separate secondary cell is termed a *merispore*. *Gemmæ* are produced by the breaking up (by cell-division) of hyphæ into series of cells capable of germinating. The germination of spores is dependent chiefly on moisture, but to their farther development specific conditions are necessary, a description of which is beyond the scope of this article. The dissemination of spores is effected chiefly by the agency of the atmosphere and of water, and it is probable that insects or other animals have very little to do with it.

In their *mode of life* fungi are controlled by the absence of chlorophyll. Without it they cannot assimilate, and are therefore driven to obtain their nourishment by taking up the carbon compounds assimilated by other organisms. Their modes of life are either parasitic or saprophytic. As parasites they inhabit the bodies of living plants and animals, and even of other fungi. In some cases they kill their hosts, and in others encourage growth, as in the case of the *Lichenes;* and between those two extremes various degrees of parasitism occur. As saprophytes they promote the decomposition of dead organic bodies, and thus aid in the production of carbonic acid, water, and ammonia, the elements of which return to the course of organic life. Jodin states that some fungi absorb as much as 6 per cent. of their nitrogenous contents in the form of nitrogen gas from the atmosphere. In the decomposition of fungi ammonia is formed from the nitrogenous compounds. As parasites and saprophytes their influence as regulators in the economy of nature may be compared with that of the lower animals living the same mode of life.

Though the ravages of parasitic fungi are mostly confined to the vegetable kingdom, it is well known that many animals suffer from their attack. The occurrence of parasitic fungi on insects and fish is common; more rarely do they attack the higher animals or man. It has been strongly contended that the minute fungi play very important parts in many diseases of man, but this has usually been much exaggerated. The occurrence of *Bacteria* on the mucous surfaces of living bodies and on wounds has given rise to much discussion; and there is no doubt that insufficient knowledge of these organisms has often led to error, the observers not unfrequently mistaking the products of the decomposition of organic bodies, crystalline precipitations, etc., for *Bacteria*. It may safely be maintained that these are oftener the concomitants than the causes of disease in man. A considerable number of fungi have also been described as playing active parts in various skin-diseases, but very little trustworthy information about their life-history has ever been gained.

The *economic properties* of fungi are of an unimportant character. A great number are poisonous, and many are edible; a few are used for medicinal purposes. Many of those described as edible, though they can be eaten without any serious consequence, are certainly not likely to become articles of food. At the same time it may be mentioned that much valuable food is annually lost through ignorance of the excellent esculent qualities of a few common fungi.

The *phosphorescence* or luminosity observed in several fungi has given rise to many absurd conjectures. This phenomenon depends on the respiration of oxygen, those fungi which exhibit luminosity ceasing to do so when the oxygen is extracted.

Geographical Distribution.—From the extreme poverty of our knowledge of the geographical distribution of fungi no general estimate can be even outlined. Of the fungi of by far the greater portion of the world we have no account, or at the best the meagre collections of passing explorers. Of even the European mycologic flora our knowledge is far from complete, Russia, Turkey, Spain, Portugal, and even Ireland, being only partially examined. Of countries in which the surveys have been more complete, only England, Scotland, Wales, Germany, France, and large districts of Austria, Italy, and Switzerland can be pointed to. Of the whole American continent the Carolinas alone are tolerably well known, and though collections have been made in Mexico, Texas, the island of Cuba, and a few tracts of South America, the examination of these countries has not been thorough. China, Japan, Siberia, and Further India are totally unexplored; but, on the other hand, Ceylon and the northern part of India are perhaps as well known as any other extra-European district save Carolina. From the Himalayas and northern India there are the collection and notes of Sir Joseph Hooker. In Africa, Algeria and the Cape have been examined, but from the tropical parts of that continent we have only the collection and notes of Dr. Welwitsch, which are, however, of great value so far as the district he explored extends.

Any attempted scheme of geographical distribution would, therefore, be not only incomplete but open to great error, from the very partial accounts from the most of those districts which have been examined. As in other vegetables, heat and moisture necessarily exert the greatest influence on growth, and therefore on distribution. The character of the trees composing the forests of different countries, and the amount of cultivated land, subordinately affect the nature, if not the numbers, of the fungi inhabiting them. One broad principle, however, seems apparent, viz., that the large *fleshy* fungi, like the *Agaricini*, affect temperate countries more than tropical, and that those of a woody texture, like the *Polyporei*, inhabit tropical in preference to temperate countries. In the Arctic regions fungi are represented almost solely by the *Lichenes*. Of the distribution of microscopic fungi nothing of any value is known.

Classification.—Fungi are divided into orders and suborders as follows:—

- I. *Phycomycetes.*
  - 1. Saprolegnieæ.
  - 2. Peronosporeæ.
  - 3. Mucorini.
- II. *Hypodermiæ.*
  - 1. Uredineæ.
  - 2. Ustilagineæ.
- III. *Basidiomycetes.*
  - 1. Tremellini.
  - 2. Hymenomycetes.
  - 3. Gasteromycetes.
- IV. *Ascomycetes.*
  - 1. Discomycetes.
  - 2. Erysipheæ.
  - 3. Tuberaceæ.
  - 4. Pyrenomycetes.
  - 5. Lichenes.
- V. *Myxomycetes.*
- VI. *Schizomycetes.*

The above classification is broadly the same as that proposed by Professor de Bary. The principal characters of these orders and suborders are described below.

Order I.—PHYCOMYCETES.—The *Phycomycetes* possess both sexual and asexual organs of reproduction. The sexually produced reproductive body gives rise to a generation bearing first asexual and then sexual organs, and the asexually produced reproductive body gives rise to a similar generation. The mycelium in this order consists of long densely-ramifying tubes or hyphæ, on which the reproductive organs are borne.

Suborder I.—Saprolegnieæ.—In this order the male organs are called *antheridia* and the female organs *oogonia*. In the monœcious forms these arise beside each other on the same plant. The oogonia are usually to be found at the end of short branches of the mycelium—very rarely sessile or intercalary. They are globular cells with one enclosing membrane containing dense protoplasm. In some cases (as in *Saprolegnia monoica*) the cell-wall soon becomes resorbed at various places, and the protoplasm divides into several globular bodies, which float in a watery fluid, the whole enclosed by the wall of the oogonium. In *Aphanomyces Pythium*, and several species of *Saprolegnia*, only one globe is formed in the oogonium. The fluid in which these globes float is part of the watery contents of the globes expelled when the contraction took place. While these alterations are proceeding in the oogonia, the antheridia grow out from the same or some adjoining branch of the mycelium. These are thin, crooked hyphæ, which frequently entwine the stalks of the oogonia in their growth; the tips of the tubes, however, on reaching the wall of the oogonium adhere, and the upper part becomes separated from the rest by a septum. This process is usually contemporary with the contraction or separation into globules of the contents of the oogonia. The antheridia then push through the walls one or more tubes, which discharge from the points minute motile spermatozoids (about $\frac{1}{500}$ millim. in size), and these fertilize the globules. The globules then assume a cellulose membrane and are called *oospores*.

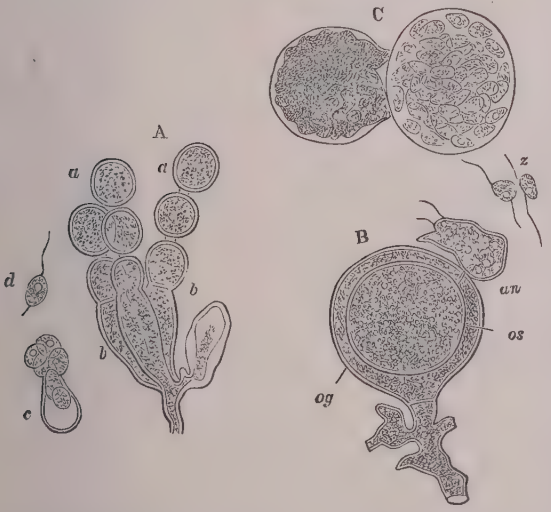

FIG. 1.—*Cystopus candidus*. A. *a*, conidia; *b*, conidiophores; *c*, conidium emitting zoospores; *d*, free zoospore. B. *og*, oogonium; *os*, oosphere; *an*, antheridium. C. Formation of zoospores by oospores. *z*, free zoospores. (After De Bary. ×400.)

The oogonia are formed in the diœcious as in the monœcious species, but the antheridia in a totally different way. They arise within bladder-like protuberances of the mycelium, which are divided by transverse septa into a series of cells, each of which is an antheridium. In *Saprolegnia dioica*, the antheridium breaks up into numerous spermatozoids; but in *Achlya dioica* a preliminary division of the antheridium into several portions precedes the formation of the spermatozoids. When free these spermatozoids move actively by means of one long cilium. Fertilization, and the consequent formation of oospores, are effected in a similar way to that described as occurring in the monœcious forms. Doubt has been expressed as to the described monœcious fertilization, but on the whole it may be regarded as generally true. The oospores of the *Saprolegnieæ* are double-coated. After a long period of rest they emit germ-tubes, but it has been recorded that they sometimes produce zoospores, when the resting state is shorter.

The zoosporangia or asexually-produced organs of reproduction are terminal cells (very rarely intercalary), sometimes irregularly cylindrical, sometimes ovoid, of a constant form in some genera (*Saprolegnia, Achlya*) but variable in others (*Pythium, Monoblepharis*).

The reproduction by means of the zoosporangia is much more extensive than that by means of the oospores. Each zoosporangium contains a great number of zoospores. The mycelium is composed of long ramifying tubes, of considerable diameter, and nearly always aseptate.

The *Saprolegnieæ* grow for the most part in water, chiefly on the dead bodies of insects. One species, *Saprolegnia ferax*, is notable on account of its extensive ravages on the bodies of fishes (especially salmon) and other water animals.

Suborder II.—Peronosporeæ.—The *Peronosporeæ* are very closely allied to the *Saprolegnieæ*—the modes of reproduction both sexual and asexual being similar to those of the monœcious forms of the latter suborder. The oogonia are terminal as a rule, and the protoplasmic contents contract always into one central globule. Two forms of germination have been observed in the oospores. In *Cystopus* they burst and produce zoopores, and in *Peronospora* the usual mode of germination is by the emission of a hypha. As regards the asexually-produced spores the same rule holds. In *Cystopus* and *Phytophthora* they are zoosporangia, producing in the former case each the same number of zoospores as the oospores; and in *Peronospora* they are usually *conidia*, emitting hyphæ on germination. Both zoospores and hyphæ produce mycelia directly.

The zoosporangia of *Cystopus* are borne in vertical series on short, club-shaped filaments; the conidia of *Peronospora* in most cases, and the zoosporangia of *Phytophthora*, on branching, tree-like sporophores. The mycelium, which is usually septate and ramifies densely, possesses frequently haustoria of various shapes.

The *Peronosporeæ* are parasitic on living phanerogams, the tissues of which they penetrate and destroy. The most notable example is the well-known potato-disease, *Phytophthora infestans*, the ravages of which are too well known to need description.

Suborder III.—Mucorini.—Sexual reproduction in this suborder is effected by means of the conjugation of two apparently similar sexual cells, which as a result of their union form a *zygospore*. It will be sufficient to describe one typical case, viz., that of *Rhizopus nigricans*. The conjugating cells of this fungus are elongated, stout tubes. Where two meet, each pushes against the other a protuberance, at first cylindrical and of equal thickness. They remain closely adhering, and soon grow considerably, chiefly in thickness. At the end of each a separate cell is formed by the growth of a partition. These two cells are usually of unequal size, one as long as it is broad, the other only half as long as its breadth. The membrane which originally separated them is now perforated in the middle, and soon vanishes altogether; the two conjugating cells thus unite and form the *zygospore*, which increases rapidly, usually attaining a diameter of over $\frac{1}{5}$ millim. It is, as a rule, drum-shaped, the ends smooth, and the free surface clothed with wart-like protuberances. The contents are coarsely granular protoplasm, in which float drops of oil. On germination the zygospore produces a hypha (as observed in *Syzygites*), which by repeated dichotomous branching soon forms a new mycelium.

Asexual reproduction is accomplished by *sporangia* similar in function, and in some degree in structure, to the corresponding organs of the two preceding suborders. They are borne terminally on special branches of the mycelial hyphæ, which, like the mycelium, are aseptate up to the time of fructification. The spores produced in the sporangia germinate by the emission of a filament, which, like that produced by the zygospore, forms by dichotomous branching a new mycelium. This was the only mode of reproduction known in the *Mucorini*, until the researches of Professor de Bary and others brought to light the sexual form, which, however, has not yet been observed in all the species.

The *Mucorini* are usually to be found growing on excrement and on decaying substances; none of the species are known to cause any important disease to plants or animals.

Order II.—Hypodermiæ.—No mode of sexual reproduction is known to belong to the plants of this order. They are (so far as is known) reproduced wholly by asexual spores arising by cell-division. All the species inhabit the parenchyma of living plants, through the epidermis of which the receptacles burst.

Suborder I.—Uredineæ.—The life-history of the *Uredineæ* consists of a cycle of three generations, the transition in each case being effected (so far as is at present known) by asexual spores. The cycle begins in spring with the germination of thick-walled spores, called *teleutospores*, borne usually in pairs at the end of sterigmata. Germination takes the form of the emission of a hypha, which rapidly (usually in two or three hours) forms a promycelium, bearing three or four sporidia. These sporidia become detached, and on finding a suitable host-plant penetrate the epidermis cells by means of a germinating filament, and form a new mycelium within the parenchyma. After a few days this mycelium begins to form receptacles under the epidermis of the host, on which are borne *æcidia* and *spermogonia*. The latter appear before the former. They are small, narrow-necked sacs, in which are found minute spore-like bodies, called *spermatia* by Tulasne, who believed them to be male organs, partly on comparative grounds and partly because he found them incapable of germinating. No female organs have been found; though it was suggested that the spermatia stood in sexual relations to the æcidia beside which they are constantly found. Professor de Bary, however, found that the spores of æcidia, on a plant on which no trace of spermogonia or spermatia could be found, germinated exactly as under other circumstances. The æcidia are at first round or oval but on bursting basin-shaped receptacles of pseudo-parenchyma, at the base of each of which a circular, flat hymenium is formed. From this hymenium there rise erect basidia bearing in vertical series a number of spores of a round polyhedral form, and filled with protoplasm colored red or yellow by oil. These spores on being liberated produce germ-tubes which penetrate the stomata of the next host plant (one of the same species as that on which the teleutospores were found), and soon form another mycelium in the intercellular spaces. Again, in a few days, this mycelium forms a new kind of receptacle, the *uredo*. This receptacle is flat and circular, and is situated immediately under the epidermis. On it basidia bearing round or oval uredospores arise and break through the epidermis. The uredospores constantly reproduce the uredo, which is the cause of the extensive ravages of this form of the disease; on the same mycelium which produces the uredo, teleutospores are ultimately formed. These hibernate, and when spring arrive again germinate, and start the same cycle of generations.

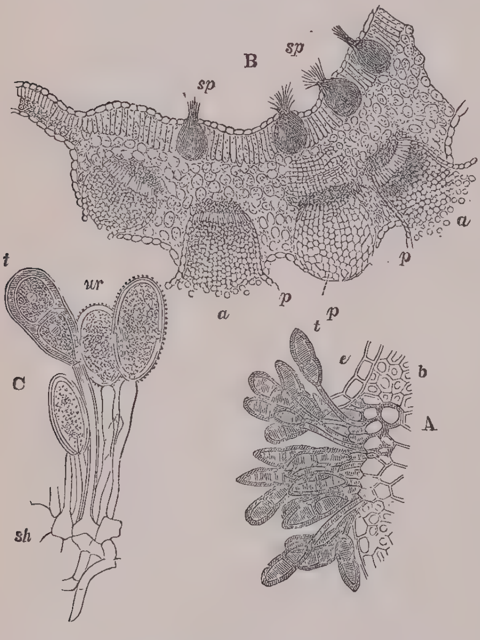

Fig. 2.—*Puccinia graminis*. A. Mass of teleutospores (*t*) on a leaf of couch-grass; *e*, epidermis ruptured; *b*, sub-epidermal fibres. (After De Bary.) B. Part of vertical section through leaf of *Berberis vulgaris*, with *a*, æcidium fruits, *p*, peridium, and *sp*, spermogonia. (After Sachs.) C. Mass of uredospores (*ur*), with one teleutospore (*t*); *sh*, sub-hymenial hyphæ. (After De Bary.)

Teleutospores
|
æcidium-spores (accompanied by spermatia)
|
uredospores, and later on the same mycelium teleutospores again.

This cycle of generations is carried out on two different host plants. The uredospores and teleutospores affect the *Gramineæ* chiefly, but the ravages of æcidia, though not so severe in their nature, extend over many species of *Compositæ*, *Ranunculaceæ*, *Leguminosæ*, and *Labiatæ*.

Suborder II.—Ustilagineæ.—The life-history of this suborder, so far as yet known, consists in the formation of asexual spores, either singly, in series, or in masses, on very slender sporophores; these germinate, and form a promycelium bearing sporidia (as in the case of the teleutospores of the *Uredineæ*), which in turn germinate and form a mycelium bearing the same kind of spores as those with which we started. This life history, it will be seen, is, so far as it goes, similar to that of the *Uredineæ*. The present order resembles the preceding one also in the habit of life. They are very injurious, especially to the *Gramineæ*. The power of producing many sporidia in successsion, possessed by the promycelium, tends to the plentiful distribution of the disease. These sporidia usually attack the axis of germinating plants, in which a mycelium is then developed and carried up with the growth of the plant, ultimately producing spores in the fruit and causing its destruction.

Order III.—Basidiomycetes.—The only form of reproduction known in this order is by asexual spores borne at the apex of erect basidia. These spores reproduce the plant directly without the intervention of another generation. The receptacle of the hymenium consists of interwoven hyphæ, and is gelatinous, fleshy, or woody in consistency; it sometimes attains great size. The mycelium is comparatively small and floccose.

Suborder I.—Tremellini.—The hymenium of this suborder bears two different kinds of basidia in different genera. In the genius *Tremella* the basidia are at first subglobose or quite spherical, and divided from top to bottom into four equal parts. These segments either remain united, or diverge, while they grow out to the margin of the fungus in the form of long hyphæ bearing kidney-shaped spores. In *Dacrymyces* and *Guepinia* the basidia are at first claviform then divergent into two arms, bearing one reniform spore each.

Spermatia are often met with abundantly in many of the *Tremellini*. They are produced in regular spermatophorous apparatus, and are very minute and spherical or ovoid. Like the spermatia of the *Uredineæ*, their function is unknown.

The consistence of these plants is gelatinous, with, in some cases, a denser nucleus. They are usually to be found growing on stumps of trees and on the ground. Their shape, when they have one, is usually more or less cup-like.

Suborder II.—Hymenomycetes.—The *Hymenomycetes* is the most widely-known group of fungi. It includes the common mushroom, to which all the species bear more or less resemblance. The familiar form is that of a pileus raised upon a stalk and bearing on its under surface the hymenium extended over gills or *lamellæ* (*Agaricini*), pores (*Polyporei*), or teeth (*Hydnacei*). From the hymenium rise the basidia, at the apex of which are usually four sterigmata bearing the spores. These spores are asexually produced, and on germinating, by emitting a hypha, give rise to a new mycelium on which the receptacle is again borne. The question of the existence of a form of sexual reproduction in the *Hymenomycetes* has been fought over many times, as yet with no certain result. Among the basidia are to be seen other cells of similar shape, but of greater dimensions, called *cystidia*;[1] it has been contended that these are male organs. The mycelium is nearly always underground.

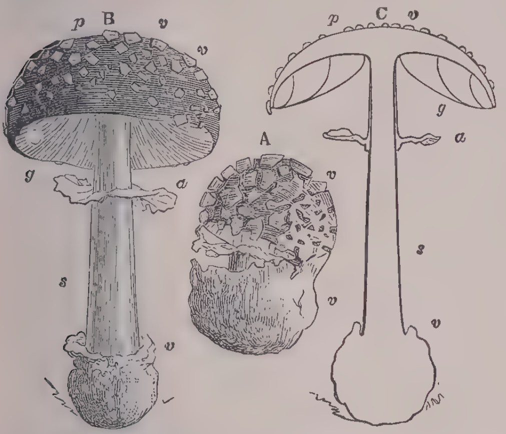

Fig. 3.—*Agaricus muscarius.* A, the young plant; B, the mature plant; C, longitudinal section of mature plant. *p*, the *pileus*; *g*, the gills; *a*, the *annulus*, or remnant of *velum partiale*; *v*, remains of *volva* or *velum universale*; *s*, the stalk.

The *Agaricini* possess an inferior hymenium spread over lamellæ or gills radiating from the stalk. These are sometimes simple and sometimes branched, and attached to or distinct from the stalk. The spores vary much in color, one color being constant to a genus or to a subgenus. On the stems of some genera an *annulus* or ring may be found, as a remnant of a veil (*velum partiale*) which united that part of the stem with the outer edge of the cap or pileus, but was ruptured on the expansion of the latter. In certain subgenera of *Agaricus* (*e.g.*, *Volaria, Amanita*) the whole plant is, when young, enclosed in a *volva* (*velum universale*), the remains of which may be seen in mature plants adhering to the base of the stem. In some genera, as in *Amanita*, both forms of veil are found together. When the stem is lateral, as in *Pleurotus*, it is usually very much suppressed. The species of *Agaricini* are usually terrestrial, many of them are edible, and a few are deadly poisons.

The *Polyporei* are distinguished by the hymenium (sometimes inferior, sometimes superior) extending over the surfaces of cavities or pores. In the genus *Boletus* the habit of an Agaric is assumed—the stem usually central, the texture almost always soft. In *Polyporus* the stem is usually lateral and the texture woody. The hymenophore is not easily separable. In some cases the habit of Polyporus is crust-like, the pores opening upwards, when it is called *resupinate.* Polypori grow usually on stumps of trees.

The *Hydnacei* possess an inferior or an amphigenous hymenium spread over teeth or spines. Some of the species have the form of a stalked pileus with the teeth inferior, while others resemble the resupinate *Polypori.* They are fleshy or corky in texture.

In the *Auricularini* the hymenium is confluent with the hymenophore. In form they resemble the *Polyporei.*

The *Clavarinei* are distinguished by an amphigenous hymenium, scarcely distinct from the hymenophore, and reaching to the apex of the plant, which is club-shaped, or in the form of upright spines. The species are gelatinous in consistence, but become horny when dry. The surface is usually smooth at first, but afterwards assumes an indented or wrinkled appearance.

Suborder III.—Gasteromycetes.—The receptacles of the *Gasteromycetes* are angiocarpous. They consist of an outer peridium enclosing masses of tissues which bear the hymenia. The basidia often bear as many as eight spores which are ultimately liberated by the bursting of the peridium, either simply or by the development of special masses of tissues. The peridium of *Phallus* resembles the *velum universale* of the *Agaricini* in its mode of enveloping the receptacle, and the appearance it presents after bursting. Within this volva is a gelatinous stratum, then an inner peridium, then the hymenium. The bursting of the peridium or volva is caused by the elongation of a stalk on which the hymenium is elevated in a kind of pileus—as in the *Agaricini.* In *Batarrea* there also occurs a universal volva, and the hymenium is similarly elevated, but the plant in this case is of a woody consistence, and spiral vessels are found in the stalk. In *Clathrus* the receptacle is in the form of a globular net.

In *Lycoperdon, Hymenogaster*, and *Nidularia* the hymenium remains unelevated, and the spores are liberated by the simple bursting of the peridium.

Order IV.—Ascomycetes.—The characteristic form of reproduction of the *Ascomycetes* is by *ascospores* formed within *asci* by free cell-formation. Other generations in the cycle of development form *stylospores* in special conceptacles called *pycnidia*, and *conidia* borne on *conidiophores.* The receptacles on which the ascospores are produced arise as the result of the union of sexual organs, which takes place on the mycelium. The receptacles vary very much in size and form throughout the order.

Suborder I.—Discomycetes.—The sexual organs of this suborder are formed on the mycelium and are called the *carpogonium* (female) and the *pollinodium* (male). As typical of the rest of the order the life-history of *Ascobolus furfuraceus*, as described by Janczewski, may be chosen. The *pollinodium* and *carpogonium* are both composed of a series of short crooked cells, in the former case much thinner than in the latter. The pollinodium embraces the more remote end of the carpogonium, which is at this stage sausage-shaped, and so fertilizes it. After fertilization one of the cells of the carpogonium (usually near the middle) increases and becomes globular. It is called the *ascogonium.* From it proceed ascogenous hyphæ on which the *asci* arise. The asci are flask-shaped, the base being the narrow portion, and within them the *ascospores*, 8 in number, are formed by free cell-formation. Between the asci, and borne on the ascogenous hyphæ, are more or less numerous *paraphyses* which are generally regarded as abortive asci, but may serve (as Boudier affirms they do) to assist in some way the dehiscence of the asci. The hyphæ of the mycelium on which the sexual organs are borne produce a dense mass of pseudo-

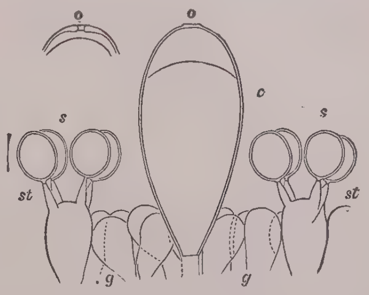

Fig. 4.—*Agaricus mucidus.* Portion of hymenium (×350). *s*, sporidia; *st*, sterigmata; *g*, sterile cells; *c*, cystidium, with operculum *o*.

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[1] Mr. W. G. Smith, who has examined a large number of cystidia, especially among the *Agaricini*, states that they all normally open by an orifice capped by a minute operculum at the top. In *Coprinus* the cystidia are unusually large, with at first a rounded top, which at length is capped by a nipple-like protuberance. After the careful examination of a large number of specimens Mr. Smith has convinced himself that the apex of each cystidium is furnished with a minute operculum, which is burst off in the discharge of the liquid or granular contents of the cystidium. In *Lactarius* the operculum is tall and cap-like. The liquid secreted by the cystidia of the *Agaricini* is sometimes granular before liberation, but in other cases not until after. When this granular matter is ripe, the grains revolve and move freely about, and if the operculum do not readily open this motion is increased until an opening is forced. Mr. Smith looks on these granular bodies as analogues of antherozoids.

parenchyma, which surrounds the carpogonium and forms the sterile part of the fructification.

Sexuality was first discovered in the *Discomycetes* by Professor de Bary in the case of *Peziza confluens*, which though it differs in details from that described as occurring in *Ascobolus*, agrees in all essential details with it.

Certain species of *Pezizæ*, the mycelium of which is extensively reproduced by conidia, undergo a resting state in the form of a *sclerotium*. This was first observed in *Peziza Fückeliana* by Professor de Bary. In it conidia are produced by the mycelium before the sclerotia. The sclerotia, which are formed without the occurrence of any sexual process, so far as has been observed, consist of densely packed hyphæ enclosed by a pseudo-parenchymatous rind. Sometimes these germinate shortly after their formation, and produce a mycelium which bears conidia again; but if germination be delayed for a month or two, the characteristic basin-shaped hymenium of *Peziza*, with asci and ascospores, is formed.

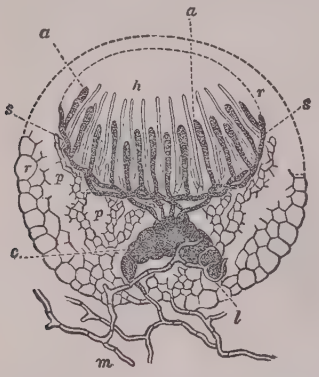

FIG. 5.—*Ascobolus furfuraceus.* Diagrammatic section of the fructification (after Janczewski). *m*, mycelium; *c*, carpogonium; *l*, pollinodium; *s*, ascogenous filaments; *a*, asci; *r*, *p*, the sterile tissue from which the paraphyses *h* spring.

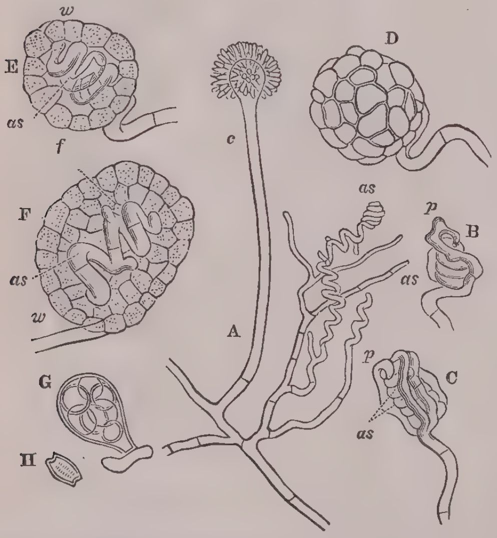

FIG. 6.—Development of *Eurotium repens* (after De Bary). A, small portion of mycelium with conidiophore *c*, and young ascogonium *as*. B, the spiral ascogonium (*as*), with the antheridium (*p*). D, the same, beginning to be surrounded by the hyphæ forming the perithecium wall. D, the perithecium. E, F, sections of young perithecia; *w*, parietal cells; *f*, pseudo parenchyma; *as*, ascogonium. G, an ascus. H, an ascospore.

Spermatia are found in this as in other orders. They are borne in *spermogonia*, similar to those of the *Uredineæ*, and were long believed to be incapable of germination. M. Cornu, however, has recently stated that he caused them to germinate under artificial conditions, and to produce a mycelium like the conidia.

In *Peziza* and the genera closely allied to it, the ascogenous receptacle is basin-shaped, with the hymenium on the inner surface of the basin; but in other genera it takes the form of clubs or stalks of considerable size with the hymenium on the outer surface (as in *Geoglossum*, *Spathularia*, *Helvella*, *Morchella*, etc.).

The species of *Morchella* and *Helvella* are, as a rule, esculent; but none of the other *Discomycetes* have ever obtained any reputation in this direction.

Suborder II.—Erysiphyeæ.—In this suborder the species follow two types in their mode of sexual reproduction, viz., *Erysiphe* and *Eurotium.*

The mycelium of *Erysiphe* creeps over the surface of its host plant, through the epidermis of which it sends down numerous haustoria. Both the conidia and the sexually produced fruits are borne on the same mycelium. The conidia occur in vertical order at the end of unbranched conidiophores. These conidia reproduce the mycelium directly. The mode of sexual reproduction resembles that of the *Discomycetes*. The carpogonium is more or less globular in shape, and is fertilized by a pollinodium of one or more branches. The carpogonium is at first represented by one cell, but after fertilization a transverse wall divides it into two cells, the inferior one of which must be regarded as an ascogenous hypha. The superior one becomes the ascus, which in most cases contains 8 spores. In a few other forms several asci are formed by the carpogonium.

The species of *Eurotium*—*e.g.*, *E. repens* and *E.* (*Aspergillus*) *glaucus*—agree in the more striking details of their life-history with those of *Erysiphe*. The mycelium may be found as a fine flocculent mass on the surfaces of most putrefying organic matter. The usual and most extensive mode of reproduction is by the conidia, which are formed in great abundance at the apex of the conidiophores. These germinate and grow under most varied conditions, which fact, coupled with their plentiful production, explains the general distribution of the fungus. Subsequently the sexual organs arise on the same mycelium. The carpogonium is the end of a mycelial hypha wound up in the form of a corkscrew, with a tranverse septum at each turn of the screw. From the lowest turn two tubes sprout and grow up on the outside of the carpogonium; one always grows more rapidly than the other, and reaches the top of the carpogonium, which it fertilizes. This is the pollinodium. Other cells then grow out from the bases of both organs and envelop them. After fertilization the carpogonium divides into several cells from which the ascogenous hyphæ arise. The asci contain ascospores which germinate as in the other *Erysipheæ*. The whole fructification is called the *perithecium*.

Suborder III.—Tuberaceæ.—The mycelium of the *Tuberaceæ* is in most cases small in comparison with the fructification. This fructification consists usually of a large subterranean tuberous body, possessing a thick wall of pseudoparenchyma, and enclosing a dense mass of hyphæ, among which the ascogenous filaments produce the asci embedded in sterile paraphyses. Conidia are known only in the case of *Penicillium glaucum*, a fungus which, from its common occurrence, and its being well known in all its stages, may be chosen as a type of the suborder. Its mycelium inhabits almost any organic substance, and produces on erect conidiophores long chains of conidia in very great abundance. It is only in darkness that (as in the other *Tuberaceæ*) the sexually produced form of fructification arises. The sexual organs resemble in a very high degree those of *Eurotium* (see preceding suborder), but the development of the fructification after the ascogonium has been fertilized is totally different from the corresponding process. After the ascogonium has begun to germinate, the growth of the enveloping hyphæ so hinders this process that it is forced to rest in a sclerotioid state. If germination, however, be encouraged by artificial means, the ascogenous hyphæ force their way out and form asci, in each of which there are 8 ascospores. These spores, on germinating, produce a mycelium which bears conidia. If the germination of the sclerotia be delayed so long that the ascogenous hyphæ lose the power of producing asci, the enveloping filaments give rise to the conidial form of fructification. The structure of these sclerotia is so similar to that of the well-known tuberous fructifications of the *Tuberaceæ*, that Brefeld, who discovered them, classes *Penicillium* with this suborder, in spite of the very strong resemblance of the sexual organs to those of *Eurotium*. In no other species of *Tuberaceæ* has this life-history been observed.

Suborder IV.—Pyrenomycetes.—The *Pyrenomycetes* produce their asci within round or flask-shaped *perithecia*, with walls of pseudo-parenchyma. The asci contain, as a rule, 8 spores. In some cases the perithecium is open at first, but in others the neck, closed during the earlier stage, forms subsequently a canal through which the spores escape. In the case of the *Sphæriæ simplices*, the perithecia arise on a very fine mycelium, and according to Woronin and others are the result of a sexual act. In *Xylaria* and allied genera, however, the perithecia are formed on sometimes very large club or basin shaped bodies, consisting of dense masses of tissue, which, according to some, are simply the receptacles, and according to others, bearers of sexual organs, the union of which gives rise to the perithecia. Analogy leads to regarding them as receptacles. Conidia are formed not only on the mycelium but also on the stroma, and even occasionally on the hyphæ composing the wall of the perithecium. *Spermogonia* and *pycnidia* are other conceptacles which give rise to asexual organs of reproduction, called respectively *spermatia* and *stylospores*. It was urged with much show of probability that these were parasitic bodies; but the recent researches of Dr. Bauke on the *pycnidia* and M. Cornu on the *spermatia* seem to disprove this view. M. Cornu states that he caused spermatia to germinate and reproduce the mycelium of the species to which they belonged. It will be seen, however, that in the next suborder (*Lichenes*) the analogous spermatia act as male organs,—a function which not only precludes the possibility of their parasitic nature, but does not agree well with M. Cornu's (so far as we know) unconfirmed views. In *Claviceps purpurea* (ergot), which attacks the young ovary of rye, the mycelium first bears conidia embedded in a mucous secretion; this is called the *sphacelia* stage. The mycelium, however, soon permeates the ovary and forms a hard sclerotium—the ergot stage. After undergoing a period of rest, usually from summer to spring, but varying in length, the sclerotium on falling on damp ground pushes out small stalks with a rounded head in which numerous flask-shaped, wall-less perithecia arise. These perithecia bear as usual asci containing ascospores. The ascospores, on germinating, and finding their usual host—the rye, or some nearly related grass—give rise again to the sphacelia, which closes the cycle.

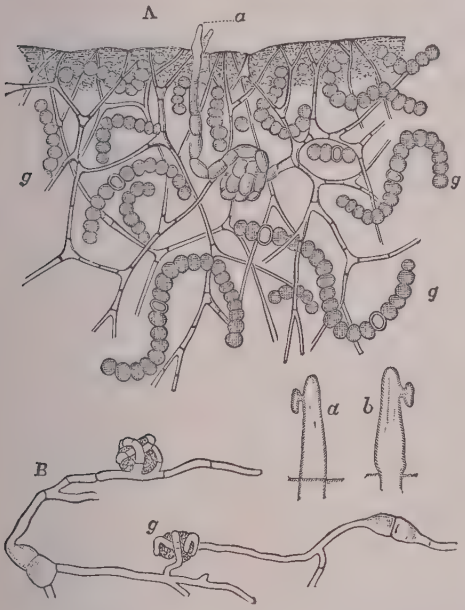

FIG. 7.—A, transverse section through the thallus of *Collema microphyllum*, with *g*, gonidia, and *a*, the point of trichogyne (×350); *a*, *b*, the point of trichogyne with spermatium attached (×750). B, spores of *Thelidium minutulum*, the germinating filaments of which enclose the (*g*) hymenial gonidia of *Endocarpon*. (After Stahl.)

This suborder, like the *Discomycetes*, contains a great number of forms, many of which are known in only one, viz., the perithecium-bearing stage,—the other phases probably being known by other names as distinct genera and species. The *Pyrenomycetes* grow either on dead organic matter or on the bodies of living plants.

Suborder V.—Lichenes.—Until recently, and before their true nature was understood, the *Lichenes* were treated as constituting a separate class of cellular cryptogams or Thallophyta. The researches of Schwendener, Stahl, De Bary, Bornet, and others have proved that these consist of a fungal *Ascomycetous* element parasitic on an algal element. The algal element belongs to the lower orders of *Algæ* and acts as the nourisher of the fungal element. The fungal element is reproduced by *Ascomycetous* reproductive organs, and the algal element, which in a free state is capable of independently subsisting, is reproduced in the manner characteristic of the order of *Algæ* to which it belongs. We have to do here with the life-history of the fungal portion only, but illustration will be given of its relations with its hosts.

Though sexuality is not known to exist generally in the *Lichenes*, it has been so satisfactorily proved in the case of the *Collemaceæ* by Dr. Stahl that it may be concluded that investigation only is necessary to bring fresh cases to light. In the *Collemaceæ* the male organs of reproduction (the *spermatia*) are formed within receptacles called *spermogonia* (similar organs have been described as occurring in the *Uredineæ*, etc.), and though not possessing the power of spontaneous motion, reach the female organ (*trichogyne*) by the agency of water or the atmosphere. The spermatia consist of one simple minute cell; the *trichogynes* are of a more complicated structure, and may be described as consisting of a unicellular organ of conception, a conductive canal, and an ascogonium, consisting of a coiled hypha of several cells. The point of the trichogyne emerges from the surface of the thallus, and the spermatia on coming in contact become united with it by a small tube through which the contents of the male organs fertilize the trichogyne. After fertilization the cells of the ascogonium increase in number and size, and the ascogenous hyphæ spring from the original coil and bear the characteristic asci in which the ascospores are formed.

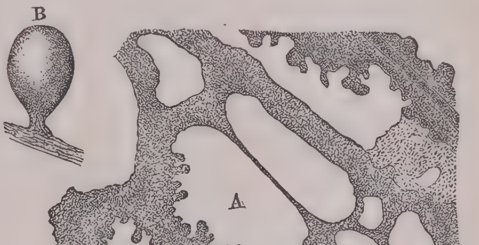

FIG. 8.—A, plasmodium of *Didymium leucopus*. (After Cienkowski ×350.) B, closed sporangium of *Arcyria incarnata*. (After De Bary, ×20.)

The relations between the fungal and the algal elements may be illustrated by the following instance from Dr. Stahl's *Beiträge zur Entwickelungsgeschichte der Flechten*. The Algæ were formerly considered organs of the fungal portion, and received the name of *gonidia*. A smaller form of *gonidia*, called the *hymenial-gonidia*, occurs in interstitial spaces of the apothecia of many Lichens; these *hymenial-gonidia* are the offspring of the ordinary gonidia (the *thallus-gonidia*), and have been carried up in the hymenium by the growth of its hyphæ. When the ascospores are emitted from the apothecia, the *hymenial-gonidia* are cast out also, and falling in the neighborhood of the ascospores are, many of them, enveloped by the germinating filaments proceeding from the spores, when the conditions are favorable for growth. Along with the growth of the hyphæ, these *hymenial-gonidia* increase in size, and ultimately act as the *thallus-gonidia* of the new Lichen. This process has been observed in *Dermatocarpon Schæreri* and *Polyblastia rugulosa*. When this discovery was made by Dr. Stahl, he found growing beside the *Dermatocarpon* a species of *Thelidium*, the *gonidia* of which appeared to belong to the same species of Alga as those of the *Dermatocarpon*. He isolated, under favorable conditions for growth, the spores of *Thelidium* and the *hymenial-gonidia* of *Dermatocarpon*, and soon obtained the thallus of *Thelidium* complete as regards gonidia and fructification. This experiment, by proving that the same species of Alga (in this case a species of *Pleurococcus*) served as the *gonidia* of two totally different fungi, also strongly supports the above views as to the dual nature of the elements composing the Lichen. These views, though supported by the most eminent botanists and backed by incontestable facts, are still occasionally the subject of attack by lichenologists.

The suborder *Lichenes* contains a greater number of species than any other suborder or order of fungi, but it is probable that excessive subdivision has given rise to many. Lichens grow chiefly in exposed situations, such as the bark of trees and rocks, and are very generally distributed throughout the globe. They vary much in size and form, but are generally of a foliaceous or encrusting habit. They form a large proportion of the vegetation of alpine and polar regions. Their economic and medicinal properties are in many cases of importance.

Order V.—MYXOMYCETES.—In the first stage of their life-history the *Myxomycetes* are mobile organisms, differing so strongly from any state of any other vegetable that it was proposed by Professor de Bary to place them among amœboid animal organisms. In this stage, where one would expect a thallus of hyphæ, a mobile plasmodium is found, which in habit of life greatly resembles animal organisms. In appearance it is slimy or creamy, and consists of numerous anastomosing net-like channels, through which there is conducted with more or less rapidity a current of protoplasmic matter containing many foreign bodies, such as particles of coloring matter of different natures, starch granules, diatoms, spores of fungi, etc. These channels are not bounded by any definite membrane, and the direction is frequently changed, probably for the purpose of gathering nourishment. Where one or more individuals are situated near each other these plasmodia occasionally unite (this has been observed between two different species). These mobile masses ultimately, usually after undergoing division, are transformed into motionless fruits, in some cases of regular form (*sporangia*), and in others of irregular (*plasmodiocarp*). Compound fruits called *æthalia*, of regular or irregular form, either naked or enclosed by a membrane (*cortex*), are produced externally on definite sporophores by cell-division, or within the fruit by free-cell formation. On germinating, the contents of the spores escape either in the form of a zoospore with a nucleus, vacuole, and long cilia, or of an amœboid, and these zoospores or amœboids soon aggregate and form mobile plasmodia.

Taking the two generations in their life-history, it will be found that the fructification has probably greater claims to a fungal nature than the plasmodium has to an animal. They have, therefore, been retained in the vegetable kingdom by the majority of botanists,—whether justly or not remains to be determined by future research.

Order VI.—SCHIZOMYCETES.—In the *Schizomycetes*, the usual and apparently most common form of reproduction is by simple segmentation. In several forms, however, reproduction of a higher type has been observed. An instance of this is to be found in *Bacillus anthracis*—the cause of splenic fever—the life-history of which, according to Ewart, Koch, and others, is as follows: At first the *Bacilli* consist of motionless hyaline rods capable of segmentation, which after a short time pass through a motile phase lasting usually several hours. After settling down these rods elongate considerably in a short time; if the temperature be favorable a rod may increase in five hours to from 80 or 100 times its original length. The filaments usually become interwoven like mycelial hyphæ, and are in most cases irregular in their course. Within them spores are soon formed by free self-formation, each spore being separated from its neighbor by a transverse septum. At this stage the filaments decay more or less rapidly and set free the oval spores, which are, from Cohn's measurement, not more than $\frac{15}{25000}$ to $\frac{22}{25000}$ inch in their greatest diameter. According to Koch these spores directly elongate into filaments, but Ewart has more recently observed that they divide into four sporules, each of which germinates by the production of a filament. These filaments become motionless rods such as those from which we started.

In the classification of this order much confusion exists from the meagreness of our knowledge of the life-history of its members. Organisms described as *Micrococcus*, *Bacterium*, and *Bacillus* are apparently in many cases different phases of the same life-history. Much attention has been paid to their influence on diseases of men and animals, from their frequent occurrence on mucous surfaces, on wounds, and elsewhere. An extensive literature has arisen on this subject, but its interest is far more medical than botanical. Whether these organisms are the concomitants or the causes of diseases in men and animals has not often been decided, and is still much debated,—a source of frequent error being the confusion of débris of various kinds with *Bacteria*, etc. "Spontaneous generation" has also been attributed to them, but there has certainly not been anything like proof to support this assertion.

The following are the most important works of reference on this subject:—

Morphology and Physiology.—A. de Bary, *Morphologie und Physiologie der Pilze, Flechten, und Myxomyceten*, Leipsic, 1866; Id., *Die Mycetozoen Schleimpilze*, Leipsic, 1864; Id., *Untersuchungen über die Brandpilze*, Berlin, 1853; Id., "Recherches sur les Champignons parasites," in *Ann. Sc. nat.*, tom. xx., 4e series; Id., *Die Fruchtentwickelung der Ascomyceten*, Leipsic, 1863; Id., *Zur Kenntniss der Mucorinen und Peronosporeen*, Frankfort, 1865; De Bary and Woronin, *Beiträge sur Morphologie und Physiologie der Pilze*, Frankfort, 1864; M. J. Berkeley, *Introduction to Cryptogamic Botany*, London, 1857; H. Bonorden, *Handbuch der allgemeinen Mykologie*, Stuttgart, 1851; O. Brefeld, *Botanische Untersuchungen über Schimmelpilze*, Leipsic, 1872–77; M. Cornu, "Monographie des Saprolegniées," in *Ann. Sc. nat.*, 1872; C. Nägeli, *Die niederen Pilze in ihrer Beziehungen zu der Infectionskrankheiten und der Gesundheitspflege*, Munich, 1877; S. Schwendener, *Untersuchungen über den Flechtenthallus*, Leipsic, 1860–1868; E. Stahl, *Beiträge zur Entwickelungsgeschichte der Flechten*, Leipsic, 1878; Louis René and Charles Tulasne, *Selecta fungorum carpologia*, Paris, 1861–65; Van Tieghem, "Mémoires sur les Mucorinées," in *Ann. Sc. nat.* The student is also referred to the files of the *Botanische Zeitung*, the *Annales des Sciences naturelles*, Pringsheim's *Jahrbücher*, and Cohn's *Beiträge zur Biologie der Pflanzen*, for excellent and important papers, far too numerous to be quoted here.

Systematic Mycology.—M. C. Cooke, *Handbook of British Fungi*, London, 1871; A. Corda, *Icones Fungorum hucusque cognitorum*, Prague, 1837–42; M. J. Berkeley, *Outlines of British Fungology*, London, 1860; P. Bulliard, *Herbier de la France*, Paris, 1780–98; E. M. Fries, *Systema Mycologicum*, Greifswalde, 1821–32; Id., *Hymenomycetes Europæi*, Upsala, 1874; Id., *Icones selectæ Hymenomycetum nondum delineatorum*; L. Fückel, *Symbolæ Mycologicæ*, Wiesbaden, 1869–75; L. Rabenhorst, *Deutschlands Kryptogamen-Flora*, Leipsic, 1844–48; J. Rostafinski, A Monograph of the Myxomycetes in the Polish language (partly translated into English by M. C. Cooke); J. Sowerby, *Colored Figures of English Fungi*, etc., London, 1797–1815; L. R. and C. Tulasne, *Fungi hypogæi*, Paris, 1863; D. R. Visiani, *I funghi d'Italia*, Genoa, 1834; C. Vittadini, *Monographia Tuberacearum*, Milan, 1831; Id., *Monographia Lycoperdineorum*, Turin, 1843.

(G. MU.)

FUR. Certain animals, which inhabit the colder climates, have a covering upon the skin called fur, lying alongside of another and longer covering, called the overhair. The fur differs from the overhair in that it is soft, silky, curly, downy, and barbed lengthwise, while the overhair is straight, smooth, and comparatively rigid. These properties of fur constitute its essential value for felting purposes, and mark its difference from wool and silk; the first, after some slight preparation by the aid of hot water, readily unites its fibres into a strong and compact mass; the others can best be managed by spinning and weaving.

On the living animal the overhair keeps the fur filaments apart, prevents their tendency to felt, and protects them from injury—thus securing to the animal an immunity from cold and storm; while, as a matter of fact, this very overhair, though of an humbler name, is most generally the beauty and pride of the pelt, and marks its chief value with the furrier. We arrive thus at two distinct and opposite uses and values of fur. Regarded as useful for felt it is denominated staple fur, while with respect to its use with and on the pelt it is called fancy fur. For the one purpose the Russian hare skin is more valuable than the Russian sable, while for the other the sable may be valued at one thousand times the former.

History.—The manufacture of fur into a felt is of comparatively modern origin, while the use of fur pelts as a covering for the body, for the couch, or for the tent is coeval with the earliest history of all northern tribes and nations. They were not simply a barbarous expedient to defend man from the rigors of an arctic winter; woven wool alone cannot, in its most perfect form, accomplish this. The pelt or skin is requisite to keep out the piercing wind and driving storm, while the fur and overhair ward off the cold; and they are as much a necessity to-day among more northern peoples as they ever were in the days of barbarism. With them the providing of this necessary covering became the first purpose of their toil; subsequently the article grew into an object of barter and traffic, at first among themselves, and afterwards with their neighbors of more temperate climes; and with the latter it naturally became an article of fashion, of ornament, and of luxury. This, in brief, has been the history of its use in China, Tartary, Russia, Siberia, and North America, and at present the employment of fancy furs among the civilized nations of Europe and America has grown to be more extensive than at any former period. The supply of this demand in earlier times led to such severe competition as to terminate in tribal pillages and even national wars; and in modern times it has led to commercial ventures on the part of individuals and companies, the account of which, told in its plainest form, reads like the pages of a romance. Furs have constituted the price of redemption for royal captives, the gifts of emperors and kings, and the peculiar badge of state functionaries. At the present day they vie with precious gems and gold as ornaments and garniture for wealth and fashion; but by their abundance, and the cheapness of some varieties, they have recently come within the reach of men of moderate incomes. The history of furs can be read in Marco Polo, as he grows eloquent with the description of the rich skins of the khan of Tartary; in the early fathers of the church, who lament their introduction into Rome and Byzantium as an evidence of barbaric and debasing luxury; in the political history of Russia, stretching out a powerful arm over Siberia to secure her rich treasures; in the story of the French occupation of Canada, and the ascent of the St. Lawrence to its source in Lake Superior, and the subsequent contest to retain possession against England; in the early settlements of New England, New York, and Virginia; in Irving's *Astoria;* in the records of the Hudson's Bay Company; and in the annals of the fairs held at Nijni-Novgorod and Leipsic. Here it may suffice to give some account of the present condition of the trade in fancy furs. The collection of skins is now chiefly a matter of private enterprise. Few, if any, monopolies exist. The Alaska Commercial Company, now about ten years old, enjoys some special privilege for the taking of seal skins on the Pribiloff Islands, and some peculiar restrictions exist in Russia in relation to certain peltries, but beyond this, the trade in furs is a free one the world over. Individual enterprise, skill, forecast, and capital, have an open field. The Hudson's Bay Company, with its chief office in London, still maintains its organization, but conducts its affairs in North America under no special or royal grant, and competes in the open market with individual traders throughout Canada, Labrador, Manitoba, and Columbia. Its collection of peltries is offered to the highest bidder at public auction in London, in January, March, and September of each year.

Private collectors and dealers throughout Canada and the United States forward their furs to the seaboard, chiefly to New York, for sale there, or for consignment principally to London and to Leipsic. The latter town still maintains the custom of spring and autumn fairs, at which most kinds of wares are sold or exchanged with dealers from Turkey, Austria, and Russia. Nijni-Novgorod is the chief fair for European Russia, though very important fairs are also held in Kasan and in Irbit among the Ural Mountains. The most important fair for eastern Siberia is held at Kiachta, on the borders of China, where an extensive exchange of furs is carried on with the Celestials. Japan has added but little to the activity or extension of the fur trade, though her northern shores have furnished many a fine fur seal and sea otter to the hardy navigator. Staple furs, or those used chiefly in the manufacture of hats, are those of the hare and the rabbit, collected mainly in Russia, Germany, France, and England, dressed, carroted, and cut from the skin in western Germany, France, Belgium, and England, and thence distributed to the manufacturing centres of the world; and here it may be added that the clippings and cuttings of fancy furs from the workshops of furriers are all saved, and find their way to the machinery which utilizes the waste and transforms them into hatters' furs. But of all these fur marts that of London is the chief, for thither tend by the laws of trade, not only much of the produce of Asia and Europe, but also the fine peltries of Chili and Peru, the nutria from Buenos Ayres, the fur seal of Cape Horn and South Shetland, the hair seal from Newfoundland, as well as the inferior peltries of Africa. To prepare fur skins in a way to endure this long transportation is a simple and easy matter. When stripped from the animal the flesh and fat are carefully removed, and the pelts hung in a cool place to dry and harden; nothing is added to protect them. Care is taken that they do not heat after packing, and that they are occasionally beaten to destroy worms. A marked exception is the case of the fur seal, which is best preserved by liberal salting and packing in hogsheads. All other raw furs are marketed in bales.

Kinds and Quantities.—Few kinds of animals furnish a pelt of suitable weight and pliability, and all of them differ widely in elegance of texture, delicacy of shade, and fineness of overhair, and it is these differences which determine their place in the catalogue of merchandise. These few animals are not very prolific, and many of them attain their greatest beauty in wild and uncultivated regions. To this remark there are some notable exceptions. Being thus few in kind, and limited in quantity, one might fear the extinction of the several choice varieties through the persistent energy of the trapper. But here the fickleness of fashion steps in, and does for the fur trade what the law of supply and demand does for the more staple articles of commerce. Fashion, fastidious and fickle, neglects the use of certain kinds for a season; the market price of the pelt no longer repays the outfit of the trapper; the hunt is intermitted, and in two or three years the animal regains its numbers and strength. The annual collection of furs is thus a matter of ceaseless change; but the following may be relied on as an estimate correct enough for all practical purposes:—

Average Annual Collection.

Badger	America	5,000
“	Europe and Asia	50,000
Bear	America	15,000
“	Europe and Asia	4,000
Beaver	Asia	20,000
“	America	200,000
Buffalo	America	100,000
Chinchilla	Peru and Chili	100,000
Cat, Wild		10,000
“ House		1,000,000
Ermine	Asia and Europe	400,000
Fisher	America	12,000
Fitch	Europe	600,000
Fox, Silver	Asia and America	2,000
“ Cross	Asia and America	10,000
“ Blue	Europe and America	7,000
“ White	Arctic	75,000
“ Red	Asia and Europe	300,000
“ “	America	60,000
“ Gray	America	30,000
“ Kitt	America	40,000
Hamster	Europe	200,000
Hare	Asia and Europe	4,500,000
Kolinsky	Asia	80,000
Lamb	Persian	100,000
“	Astrakhan	600,000
“	European	2,000,000
Lion		500
Lyme		50,000
Marten	America	130,000
“ Stone	Europe	150,000
“ Baum	Europe	60,000
“ Russian Sable		100,000
Mink	America	250,000
“	Russia	50,000
Monkey	Africa	40,000
Musk Rat	America	3,000,000
“	Russia	100,000
Nutria	South America	3,000,000
Opossom	America	250,000

Otter, Land		40,000
" Sea	North Pacific	5,000
Rabbit	Europe	5,000,000
Raccoon	America	500,000
Seal, Hair	Atlantic	1,000,000
" Fur	Pacific	200,000
Skunk	America	350,000
Squirrel	Siberia	6,000,000
Tiger	Bengal and North China	500
Wolf		25,000
Wolverin		3,500

For the habits of these animals, and their modes of life, reference must be made to the separate articles, and to such works as those of Cuvier and Brehm. But a brief account may be given here of the different qualities of the pelts, with some general remarks as to their average value and their customary uses.

Badger.—Size, 2 by 3 feet; overhair coarse, 3 to 4 inches long, black with silver spots. The German are the best. Fur woolly. American have softer overhair. Used for robes, military trappings, and brushes. Value of prime, from 2s. to 6s. per skin.

Bear, Black.—Size, 3 by 6 feet; overhair 6 to 8 inches long, fine, flowing, and glossy; fur thin. Best are American. Used for robes, military caps, and mats. The finest are the cubs. Value of prime, from £1 to £4.

Bear, Brown.—Same size as the black, and very fine in overhair. Found only in the Hudson's Bay territory. Used for muffs and garniture. Value of best prime, £15. Quantity very small.

Bear, Grizzly.—Larger than the black; coarse hair; thick heavy pelt. Only found in western part of United States. Used as robes. Value, £1 to £2.

Bear, White.—Largest of the bear family; hair short and rigid; pelt thick. Found only in the Arctic regions. The best pure white are used for robes. Value from £10 to £20.

Beaver.—Size, 2 by 3 feet; overhair 3 inches long, coarse and brown in color; fur thick, fine, and dark gray. Best are from Labrador and Moon Fort. Used in every form and fashion in all northern countries; highly prized in Russia and China. Value from 4s. to 12s. per pound in the raw parchment state.

Buffalo.—Size, 8 to 12 feet long; hair coarse, color dun brown. Only found on the western and northern American prairies. Best are from the region of the Saskatchewan river. Prime are used as robes; coarse and unprime as leather for moccasins. Value 12s. to £2.

Chinchilla.—Two kinds, real and bastard. Size of real, 8 by 12 inches; overhair and fur of equal length—about 1½ inches long, very fine, and like wool may be spun and woven; color silver gray and dark. Best are from Peru. Used for muffs, boas, and borders on garments; value from 4s. to 12s. The bastard are from Chili (chinchilla means the Chilian skin), short in fur, small in size, weak in pelt, and are worth from 5d. to 10d.

Cat, Wild.—Overhair and fur thin and coarse; color gray; value and uses very limited. Civet cats are sometimes admired for their singular marks, but are in poor demand. House cats are too well known to require a description. Their colors are black, gray, red, and mottled. Best come from Holland; the poorest from Russia. Used very generally for fur work. Price of best black 4s. to 8s.; other sorts nominal.

Ermine.—Size, 4 by 10 inches; overhair and fur fine, soft, and close; pelt thin and tough; color pure white, the tip of the tail black. Best are from Barabinsk and Ischim, in Siberia. Used for muffs, garments, and linings. Value variable; the best have been as high as 6s., and as low as 7d.

Fisher.—Size, 15 by 30 inches; overhair very fine, glossy, dark, and durable, 2 inches long; fur close; tail 12 inches long, bushy, and dark. A right noble skin. Best from British America. Value from £2 to £4.

Fitch.—Size about that of the American mink; overhair fine, 1½ inches long, with dark points; fur a golden yellow. Best from Germany, Holland, and Denmark; smallest from Russia. Used for ladies' furs according to the prevalent fashion. Value from 2s. to 6s.

Fox, Silver.—Size, 2 by 4 feet; overhair thick and fine, 3 inches long, varied in color from pale silver to a brilliant blue black; fur fine and curly; its beauty places it at the head of all fancy furs; the tail is a royal brush. The choicest are from Labrador and Moon Fort; those of Russia are more woolly and less valuable. Used for muffs, boas, and linings of robes. Price from £10 to £40.

Fox, Cross.—Not quite so large as the silver, with fine overhair, but a shade of red at the points, and from the paleness of the fur making a distinct dark cross at the shoulders. Best are from the Hudson's Bay territory, and valued from £2 to £8.

Fox, Blue.—Size the same as the cross, with gray-blue overhair, and a woolly fur. The finest are from Archangel on the White Sea, and from Greenland. Value from £2 to £4.

Fox, White.—Size the same as the cross, with pure white overhair and fur. The best are from Labrador, the poorest from Asia. Value from 4s. to 12s.

Fox, Red.—Well known to all northern nations; abundant in Europe, but in size and beauty inferior to the American family. The former fetch 4s., while those from Labrador are valued at 16s.

Fox, Gray.—Only found in the United States. Overhair is gray, sprinkled with silver on the back, the sides are yellow, and the tail an ashen gray. Value from 4s. to 8s.

Fox, Kitt.—Found in north-west America and in Tartary. Overhair fine; the back is a pure gray, the sides yellow, and the belly white. In size it is the smallest of the foxes. Price from 1s. to 3s.

Hamster.—Size, 3 by 5 inches; hair short and close, back gray and the sides yellow. A great trouble to the farmers in Germany, who spare no pains to exterminate them. The pelt is made into linings for cloaks.

Hare.—Overhair fine; fur very long, fine, abundant, and strong: pelt weak; color gray and white. Best are from Russia. This skin is largely used by furriers, but its fur is among the best for hatters' purposes. Value from 5d. to 1s.

Kolinsky.—Found only in Asia, and attains the size of the American mink; overhair a golden red, 1½ inches long. The tails make excellent pencils for painters. Value from 2s. to 4s.

Lamb.—The finest, dark, close curled skins come from Persia; the next grade from the Crimea, and are gray in color; inferior skins from Astrakhan. All these are used by furriers for caps, borders, and garments. The finest Persian are worth 12s. to £1, the Crimean 6s., and the Astrakhan from 1s. to 2s. The lamb-skins of western Europe are used for lining gloves. Angora sheep are sometimes in demand, and are colored red, blue, gray, and orange to suit the fashion for fringes and borders. Their value is from 12s. to £2.

Lion.—The finest from Asia. Specimens are rare, and price variable.

Lyme.—Size, 2 by 3½ feet; overhair fine and flowing, of a clear silver blue shade, sprinkled with black; length of overhair 3 to 4 inches. Best are from Sweden and Labrador. Value from 8s. to £1.

Marten, American.—Size from 5 by 15 inches to 8 by 20 inches; overhair fine and flowing, 1 to 2 inches long; fur close and thick; color of best a dark coffee brown, of poorest a pale yellow. The finest are from the Great Whale River and Labrador. Always a choice and valued pelt. Price of best £5, of poorest 2s. The tips of the tails are highly prized for artists' brushes.

Marten, Stone.—Found in Europe; the best from Hungary and Turkey. Color a dull gray, overhair coarse, and fur woolly. Value of best prime, 8s. to 12s.

Marten, Baum.—Found in Europe and Asia, of fine overhair, but woolly fur, of a brownish color, approaching that of the American marten, and furnished with a long and bushy tail. Value from £1 to £2.

Marten, Russian Sable.—These skins are in the highest estimation with furriers. Size about the same as the American marten, but the overhair is much more fine and flowing, of a rich bluish dark shade, and from 1½ to 2½ inches long; the pelt is very soft, tough, and durable. The best are from Yakutsk in Siberia. The next from the Lena river, and the poorest from the lower Amoor. Very choice grades, but of a browner shade, are furnished by Kamschatka. Value of the poor Saghalien from 4s. to 8s.; while the darkest from Okhotsk will command £30.

Mink, American.—This valuable skin has nearly the size of the marten, with an overhair that is shorter and slightly more rigid, but vies with the marten in elegance of lustre, the choicest having a dark blue shade that is always admired in furs. The best are from Nova Scotia, the State of Maine, and the Labrador coast. It is most abundant in the middle and north-western States. Value of the best, from 12s. to £2.

Mink, Russian.—Of smaller size than the American, and inferior in all other respects, but still a valuable pelt. Price of prime, from 2s. to 6s.

Monkey.—From the west coast of Africa; has a long, thin, flowing hair; of various colors, chiefly black and dun gray. Has a limited use with furriers, fetching from 2s. to 6s.

Musk-Rat.—A well-known fur in North America. Size 8 by 12 inches; overhair coarse and light brown; fur fine, thick, and silky; in general favor with furriers, and available for a great variety of purposes. Best are from New England and New York; very prolific in cultivated regions. The price is very fluctuating, and as the annual collection varies from three to five millions of skins, it is difficult to forecast the market value. Price for prime, from 6d. to 3s. A variety of black colored musk-rat from Delaware and Maryland fetches double these prices.

Nutria.—From the La Plata, South America; in size and value between the beaver and the musk-rat; overhair coarse and rigid; fur short and fine; pelts too often unsound, and hence the value of the fur is chiefly for hats. Price of dry skins from 1s. to 2s. per pound.

Opossum.—Chiefly from the United States, but some also from Australia. Overhair long, coarse and whitish gray; fur woolly. Best from Ohio. Value from 5d. to 2s.

Otter.—Comes from all northern countries. Size of best, 2 by 5 feet; overhair thick and close; color brown black. Best are from Labrador and Canada. The skin is in high reputation and general use with furriers. Value of best, £1, 10s. to £3.

Otter, Sea.—Found only in the North Pacific Ocean, on the coasts of Alaska, Kámchatka, and Japan. Size, 2 by 6 feet; overhair exceedingly fine, and extending but little beyond the fur, which itself is very thick, close, fine, and silky; color dark brown, occasionally with silver points regularly interspersed; pelt pliable and firm. The poorest skins are not more valuable than those of the beaver; but the fine choice specimens command from £20 to £100. They are in high repute with the Russians and Chinese.

Rabbit.—Size, 10 by 16 inches: fur thick and fine; pelt weak; color all shades from black to white. Best are found in England, but the purest come from Poland. The best colored skins are used by furriers, but much the larger portion is cut for hatters' fur. The animal is largely bred in warrens, and its flesh used as food; the pelts thus become of secondary importance, and, being abundant, supply a cheap fur.

Raccoon.—One of the peculiar and valuable pelts of the United States, and flourishing best in cultivated regions. Size, 1 by 2 feet; overhair not fine, but bright in color, 3 inches long, thick, and flowing; fur resembling that of the beaver; color from silver blue to gray brown and coffee brown. Best are from Michigan and Ohio. Average value of prime, 4s. Some specimens vie with the fisher in its peculiar shade, and some even with the silver fox, and such rare skins bring from £1 to £4.

Seal, Hair.—Chiefly from the North Atlantic. Size from 3 to 10 feet; hair coarse and rigid; no fur; divided into white coats, blue backs, mottled, and ordinary. Used for saddlery and military purposes. Average price, 2s.

Seal, Fur.—Found only in the Pacific and in the South Atlantic. Size of the wigs, 4 by 8 feet; of the large, 3 by 6 feet; middling, 2½ by 5 feet; small, 2 by 4 feet; the pups vary in length from 2 to 4 feet. Overhair coarse and rigid; fur fine, thick, silky, and very uniformly distributed. Pelt thin, pliable, and of light weight. The largest number come from Alaska, whence 100,000 are allowed by law to be brought annually. The best of these are the prime middling pups. Value varies from £1 to £3 in the salted state. A few fine skins come from the coast of British Columbia, and being caught in winter are in prime condition. The choicest skins are taken on the South Shetland and South George Islands in the Antarctic Ocean. Fur fine beyond comparison; pelt very pliable, light, and thin and firm. Value salted, from £2 to £10.

Skunk.—Another peculiar production of North America. Size, 10 by 16 inches long; overhair fine, 3 inches long, dark blue and coffee brown, thick, glossy, and flowing. Many have two white stripes, more or less broad, extending from the head to the tail. It is now easy to deodorize the skin, and the fur is a popular one in all countries. The best are from New York and Ohio; value of best prime black, from 4s. to 10s.

Squirrel.—Only those of northern Europe and Asia have a value as merchandise. American are worthless. Size, 3 by 6 inches; overhair and fur equally fine; color from pale blue to clear dark blue; best are from eastern Siberia; palest and poorest from European Russia; bellies white; tails long and bushy. This fur is in universal demand among furriers for muffs and linings, as well as for large garments. Pelt pliable and tough; fur durable, close, and fine. The tails are made into boas and brushes.

Tiger.—Specimens are rare. Those from Bengal are large and short in hair, but well marked; while those from northern China have hair 2 to 3 inches long, and frequently measure 10 to 14 feet in length. Value of the latter, from £10 to £20.

Wolf.—The largest are from Labrador, measuring from 4 to 6 feet long, chiefly gray-brown in color, with long, flowing, coarse overhair. The finest are from Fort Churchill, and fetch a high price. The American prairie wolf is a variety inferior in every respect. Price of best, £2; of the inferior, 4s. The wolf is very destructive of the fur-bearing animals, and is an object of extermination with all trappers.

Wolverin.—From Russia, Norway, and Hudson's Bay. Color a clear dark brown, overhair coarse, 2½ inches long. Value from 12s. to 24s.

Of the fur-bearers, those that seek their food in water have their finest but shortest fur on the belly, and longer fur upon the back; while those that avoid the rivers have their longest and finest fur upon the back, and their bellies clothed with fine, long, flowing overhair.

Dressing.—Raw furs are made ready for use by softening the pelt with pure butter or sweet oil, trampling them in tubs filled with fine hardwood sawdust at about blood heat, drawing the pelt over a sharp knife to remove every particle of flesh, and finally trampling them again in clean sawdust. The pelt thus becomes soft and pliable like the fine kid used for gloves. They are then ready for the furrier, who assorts the skins as to color and overhair, and cuts them in various ways to bring them to the pattern of the article required. Having been sewed together with a close fine overseam, the article is damped, and stretched upon a smooth pine board after a pattern marked, then nailed along its edges and left to dry. After removal from the board the article is trimmed, and softened by rubbing, and is then ready for the liner. The skill of the furrier lies in the taste exhibited in the arrangement of the furs, and in the economy of use of material.

Dyeing.—Furs are dyed in a variety of ways to make them uniform in color, and adapt them to the fashion and taste of the time. Ordinarily this is a cheap and ready process, and only becomes an art when employed upon fine skins, from which the overhair has been first removed by plucking, leaving the fur alone to receive the dye-stuff. Among these are the skins of the musk-rat, beaver, otter, and especially the fur seal; the last has received very careful attention, as its entire value depends upon the perfection and success of the process. Unprime fur seals part with their overhair very reluctantly, while the seasoned skins are very readily unhaired, leaving the fur in all its smoothness; thus the best grades are likely to be very good, while the rest rank only from ordinary to very common. A subsequent process is the removal of all grease from the fur, which is effected by repeated washings in softened water; if this is imperfectly done, the color will be uneven and not permanent. The final work is to prepare a dye of suitable strength, and apply it in a suitable way to infuse the coloring matters into the fur, without suffering too much of it to reach the pelt, whereby its durability might be ruined. London claims to have accomplished this for the sealskin in a manner that distances all competition; and it certainly enjoys a wide popularity, as well as the substantial fruits of the sale of its production of colored seals. But America also has its successful dyers of seals, one of the most important of the results they have achieved being the giving to the fur seal a fine deep brown color, without injuring or burning the fur, while leaving the pelt soft, light, and durable.

Prices of Fancy Furs.—The market value of dressed and manufactured furs is at the mercy of fickle fashion and the weather. The production of any one variety is very limited, and consequently those that are in fashion during a cold winter command full and even extravagant prices, while others, of equal intrinsic merit, have a merely nominal value. The consumer is not more responsible for this than are the furrier and the fur merchant. It was the remark of an old and successful fur dealer that "furs when wanted are diamonds, when not wanted are charcoal." This fact renders the trade an extremely hazardous one, and tends to make the venture in it a matter of speculation rather than of provident enterprise; and while the consumer occasionally may have to pay a very extravagant price for some few varieties of furs for a short period, it happens far more frequently that the fur dealer is a severe sufferer by reason of sanguine anticipations of advance in values, which in nine cases out of ten are doomed to disappointment. (M. M. B.)

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FUREEDPORE. See FARIDPUR.

FURETIÈRE, ANTOINE, best known as the author of a *Dictionnaire Universel de la Langue Française*, was born at Paris in 1620, and died 14th May, 1688. He first studied law, and practised for a time as an advocate, but finally entered the church and became abbé of Chalivoy. In his leisure moments he devoted himself to letters, and in virtue of his satires—*Nouvelle Allégorique ou Histoire des derniers troubles arrivés au royaume d'éloquence*, 1658; *Voyage de Mercure*, 1659, etc.—he was admitted a member of the French Academy in 1662. That learned body had long promised to the world a complete dictionary of the French tongue; and when they heard that Furetière was on the point of issuing a work of a similar nature, they interfered, alleging that he had purloined from their stores, and that they possessed the exclusive privilege of publishing such a book. After much bitter recrimination on both sides the offender was expelled in 1685; but for this act of injustice he took a severe revenge in his satire *Couches* *de l'Académie.* The reply which he made to the Academician Charpentier, entitled *Factums,* ran through four editions. His dictionary was published at Rotterdam two years after his death. It was afterwards revised and improved by Basnage, who published his edition in 1701 and again in 1725; and it continued to enjoy a high reputation till the appearance of the *Dictionnaire de Trévoux,* for which indeed it furnished the basis. Furetière's other works do not possess any great literary merit; but one of them, *Le Roman Bourgeois,* is of interest as descriptive of the every-day life of his times, and has been reprinted in 1855 under the editorship of Ed. Fournier and Ch. Asselineau. The *Fureteriana,* which appeared in Paris eight years after Furetière's death, is a collection of but little value.

FURIES (FURIÆ, also called DIRÆ) are not native to Latin mythology, but adopted and modified from the Greek *Erinyes* (see ERINYES). Originally denoting the avenging power exerted by nature against all transgressors of its regular order, and spoken of by older poets (Homer, Æschylus, etc.) either simply in the singular or in the plural as an indefinite number, the Erinyes assumed later a more rigid and methodical form. As the conception of a future life grew, they were invested with the duty of punishing sinners, and were settled in Tartarus (Virgil, *Æn.* vi.); their number was fixed down to the sacred three (a number mentioned so early as Eurip., *Orestes*), and individual names, Allecto, Tisiphone, and Megæra, occur first in the Alexandrian poets and are adopted in Latin. But besides this, Virgil, and the later poets in imitation of him, frequently employ the Furiæ in another way which is also suggested by a Greek original. The Erinyes are said to madden the transgressor and lead him into further crimes which work their own punishment (*Il.* xix. 87; *Od.* xv. 234); and Æschylus by a strong metaphor calls Helen an Erinys, as it were, a scourge of men (*Agam.* 729). Virgil develops this thought so as to make the Furiæ the agents employed by the higher gods to stir up all mischief and strife and hatred on the earth. They sit close by the throne of Jupiter, ready to execute his errands of ill (*Æn.* xii.); Allecto is sent by Juno to raise the war against Æneas (so also Ovid, *Met.* iv. 473; Statius, *Theb.* i., etc.); they are the *pronubæ* of an unhappy marriage (Lucan, viii. 90). Without regard to ethical propriety, they are employed as a convenient poetic machinery. The free, fluid conception of the Greek myth, hiding in it the deepest truth and capable of infinite growth, was in this case, as so often among the Latins, either hardened into a stiff, lifeless morality, or altered into a fanciful device to suit a capricious and arbitrary system of divine action. There are also some relics of an ancient Italian conception akin to the Erinys. Goddesses named Furinæ were powerful in the underworld; they had their own flamen Furinalis, their festival Furinalia on July 25th, their grove across the Tiber, where C. Gracchus was slain. Like Erinys the word is used both in singular and in plural; and both Furina (root bhur) and Erinys (root sar) mean "the rapidly moving" (see Kuhn in *Zeitschrift,* i.). At a very early period this genuine native idea disappeared before the Grecizing tendency, and was in the time of Varro almost forgotten (Varro, *L. L.* vi. 19).

For the artistic representation see Böttiger, *Furienmaske.*

FURNACE. Under this name are included all contrivances for the production and utilization of heat by the combustion of fuel.

The word is common to all the Romance tongues, appearing in more or less modified forms of the Latin *fornax.* But in all those languages the word has a more extended meaning than in English, as it covers every variety of heating apparatus; while here, in addition to furnaces proper, we distinguish other varieties as *ovens, stoves,* and *kilns.* The first of these, in the form *Ofen,* is used in German as a general term like the French *four;* but in English it has been restricted to those apparatus in which only a moderate temperature, usually below a red heat, is produced in a close chamber. Our bakers' ovens, hot-air ovens or stoves, annealing ovens for glass or metal, etc., would all be called *fours* in French and *Oefen* in German, in common with furnaces of all kinds. Stove, an equivalent of oven, is from the German *Stube, i.e.,* a heated room, and is commonly so understood; but it is also applied to open fireplaces, which appears to be somewhat of a departure from the original signification.

Furnaces are constructed according to many different patterns with varying degrees of complexity in arrangement; but all may be considered as combining three essential parts,—namely the fire-place in which the fuel is consumed, the heated chamber, laboratory, hearth, or working bed, as it is variously called, where the heat is applied to the special work for which the furnace is designed, and the apparatus for producing rapid combustion by the supply of air under pressure to the fire. In the simplest cases, the functions of two or more of these parts may be combined into one, as in the smith's forge, where the fire-place and heating chamber are united, the iron being placed among the coals, only the air for burning being supplied under pressure from a blowing engine by a second special contrivance, the tuyere, tuiron, twyer, or blast pipe; but in the more refined modern furnaces, where great economy of fuel is an object, the different functions are distributed over separate and distinct apparatus, the fuel being converted into gas in one, dried in another, and heated in a third, before arriving at the point of combustion in the working chamber of the furnace proper.

The most obvious distinction that can be used in the classification of furnaces is founded on the method adopted for supplying air, which may either be blown into the fire, under a pressure above that of the atmosphere sufficient to overcome the resistance presented by the packed columns of fuel and other materials to its free passage, or be drawn through it by a partial vacuum in a chimney formed by the heated gases on their way to the atmosphere. The former are known as *blast furnaces,* and the latter as *chimney draught air,* or *wind furnaces.*

Stack and Blast Furnaces.—The blast furnace in its simplest form is among the oldest, if not the oldest, of metallurgical contrivances. In the old copper smelting district of Arabia Petræa, clay blast pipes dating back to the earlier dynasties of the ancient empire of Egypt have been found in great numbers, buried in slag heaps; and in India the native smiths and iron workers continue to the present day the use of furnaces of similar primitive types. These, when reduced to their most simple expression, are mere basin-shaped hollows in the ground, containing ignited charcoal and the substances to be heated, the fire being urged by a blast of air blown in through one or more nozzles from a bellows at or near the top. This class of furnace is usually known as an open fire or hearth, and is represented in a more advanced stage of development by the Catalan, German, and Walloon forges formerly used in the production of malleable iron, and still current to some extent in Sweden, Corsica, and a few places in central Europe. Figs. 1 and 2 represent a Catalan forge in use a few years since at Montgaillard, in Ariége, then one of the few localities in which the process survived. It is now probably completely abandoned. In all of these the parts are essentially the same: the cavity in the ground is represented by a pit of square or rectangular section lined with brick or stone of a kind not readily acted on by heat, about 1½ or 2 feet deep, usually somewhat larger above than below, with a tuyere or blast pipe of copper penetrating one of the walls near the top, with a considerable downward inclination, so that the air meets the fuel some way down. In the work of iron-smelting, the ore is laid in a heap upon the fuel (charcoal) filling up the hearth, and is gradually brought to the metallic state by the reducing action of the carbonic oxide formed at the tuyere. The metal sinks through the ignited fuel, forming, in the hearth, a spongy mass or ball which is lifted out by the smelters at the end of each operation, and carried to the forge hammer. The earthy matters form a fusible glass or slag melt, and collect at the lowest point of the hearth, whence they are removed by opening a hole pierced through the front wall at the bottom. The active portion of such a furnace is essentially that above the blast pipe, the function of the lower part being merely the collection of the reduced metal; the fire

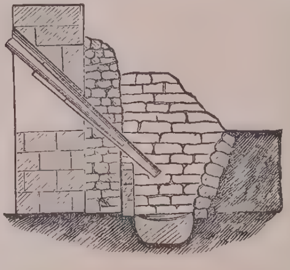
FIG. 1.—Elevation of Catalan Forge.

may therefore be regarded as burning in an unconfined space, with the waste of a large amount of its heating power. By continuing the walls of the hearth above the tuyere, into a shaft or stack either of the same or some other section, we obtain a furnace of increased capacity, but with no greater power of consuming fuel, in which the material to be treated can be heated up gradually by loading it into the stack, alternately with layers of fuel, the charge descending regularly to the point of combustion, and absorbing a proportion of the heat of the flame that went to waste in the open fire. This principle is capable of very wide extension, the blast furnace being mainly limited in height by the strength the column of materials or "burden" has to resist crushing under the weight due to the head adopted, and the power of the blowing engine to supply blast of sufficient density to overcome the resistance of the closely packed materials to the free passage of the spent gases. The consuming power of the furnace, or the rate at which it can burn the fuel supplied, is measured by the number of tuyeres and their section. In the largest modern blast furnaces used for smelting iron ores, they may be as many as six or eight, but as a rule the smaller number of from three to five of larger area is adopted, and with these there is no difficulty experienced in burning from 80 to 100 tons of coke per day in hearths of 5 to 7 feet in diameter.

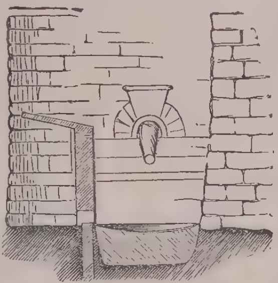
Fig. 2.—Elevation of Catalan Forge.

The profile adopted for blast furnaces has been very much varied at different times. The earliest examples were invariably square or rectangular in horizontal section, and the same class of form has been retained in many instances up to the present time; but the general tendency of modern practice is to substitute round sections, their construction being facilitated by the use of specially moulded bricks which have entirely superseded the sandstone blocks formerly used. The vertical section, on the other hand, is subject to considerable variation according to the work to which the furnace is applied. Where the operation is simply one of fusion, as in the iron-founder's so-called cupola, in which there is no very great change in volume in the materials on their descent to the tuyeres, the stack is nearly or quite straight-sided, but when, as is the case with the smelting of iron-ores with limestone flux, a large proportion of volatile matter has to be removed in the process, a wall of varying inclination is used, so that the body of the furnace is formed of two dissimilar truncated cones, joined by their bases as in fig. 3, the lower one passing downwards into a short, nearly cylindrical, position. The upper cone DC is known as the stack proper, the lower one, from the broadest part C to the tuyeres B, as the boshes, and the lower cylindrical part AB as the hearth. The further consideration of this subject belongs, however, more particularly to the article Iron. It may be sufficient to say that all blast furnaces of large size are more or less reducible to this pattern.

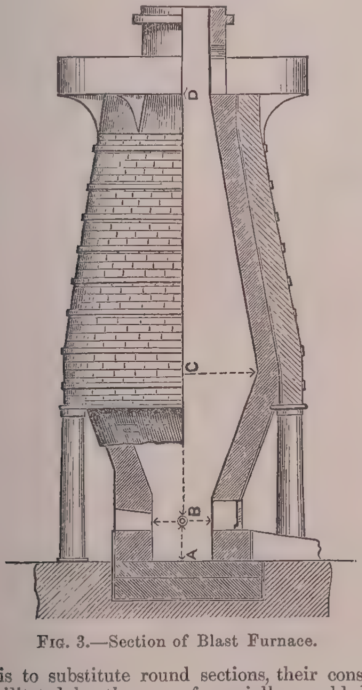

Fig. 3.—Section of Blast Furnace.

The use of bellows or of analogous contrivances is not essential to the working of stack furnaces; as the supply of air may, in furnaces of small size, be equally well obtained by the draught of a chimney, or a steam jet aspirator. The former plan is adopted in the so-called economic furnace (*hornoeconomico*) of the Cartagena lead district in Spain, used in resmelting old slags and waste products of the Roman mines, and the latter in Woodward's and Ireland's cupolas for iron foundries. In either case numerous holes representing tuyeres are provided round the lower part of the furnace, often in two rows at different heights. These furnaces have not, however, been very generally adopted; and even in Spain the chimney draught has in many instances been replaced by a fan blower.

A more primitive form of the same contrivance is still in use in Burmah,—the furnace, about 5 or 6 feet high, being placed on the side of a bank facing the prevailing wind, which enters through a series of small round tuyere holes. Similar contrivances were used by the ancient Celtic inhabitants of the Rhine valley,—the ruins of furnaces and slag heaps being found in the Nassau and Eifel hill countries, in high exposed situations far away from streams, where water power for bellows could have been obtained.

Reverberatory Furnaces.—Blast furnaces are, from the intimate contact between the burden to be smelted and the fuel, the least wasteful of heat; but their use supposes the possibility of obtaining fuel of good quality and free from sulphur or other substances likely to deteriorate the metal produced. In all cases, therefore, where it is desired to do the work out of contact with the solid fuel, the operation of burning or heat-producing must be performed in a special fire-place or combustion chamber, the body of flame and heated gas being afterwards made to act upon the surface of the material exposed in a broad thin layer in the working bed or laboratory of the furnace by reverberation from the low vaulted roof covering the bed. Such furnaces are known by the general name of reverberatory or reverbatory furnaces, also as air or wind furnaces, to distinguish them from those worked with compressed air or blast.

Originally the term cupola was used for the reverberatory furnace, but in the course of time it has changed its meaning, and is now given to a small blast furnace such as that used by iron-founders,—reverberatory smelting furnaces in the same trade being called air furnaces.

Figs. 4, 5, and 6 represent a reverberatory furnace such as is used for the fusion of copper ores for regulus, and may be taken as generally representing its class. The fire-place A is divided from the working bed B by a low wall C known as the fire bridge, and at the opposite end there is sometimes, though not invariably, a second bridge of less height called the flue bridge D. A short diagonal flue or up-take E conveys the current of spent flame to the chimney F, which is of square section diminishing by steps at two or three different heights, and provided at the top with a covering plate or damper G, which may be raised or lowered by a chain reaching to the ground, and serves for regulating the speed of the exhaust gases, and thereby the draught of air through the fire. Where several furnaces are connected with the same chimney stack, the damper takes the form of a sliding plate in the mouth of the connecting flue, so that the draught in one may be modified without affecting the others. The fire bridge is partially protected against the intense heat of the body of flame issuing through the fire arch by a passage to which the air has free access. The material to be melted is introduced into the furnace from the hoppers HH through the charging holes in the roof. When melted the products

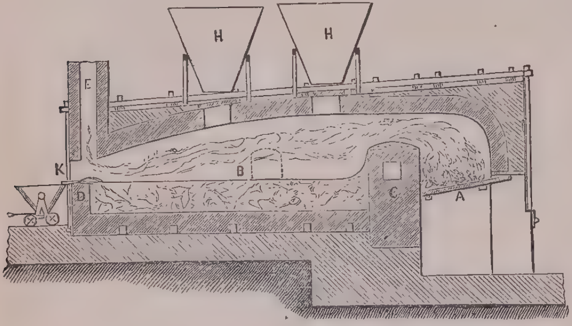

Fig. 4.—Longitudinal section of Reverberatory Furnace.

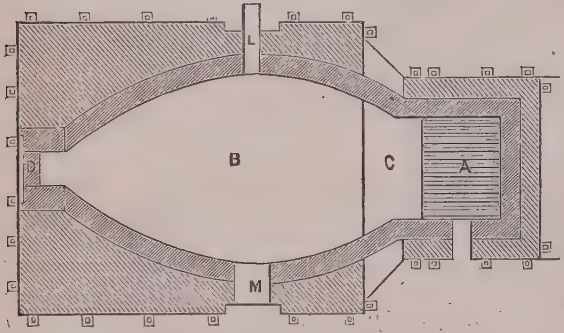

Fig. 5.—Reverberatory Furnace (horizontal section.)

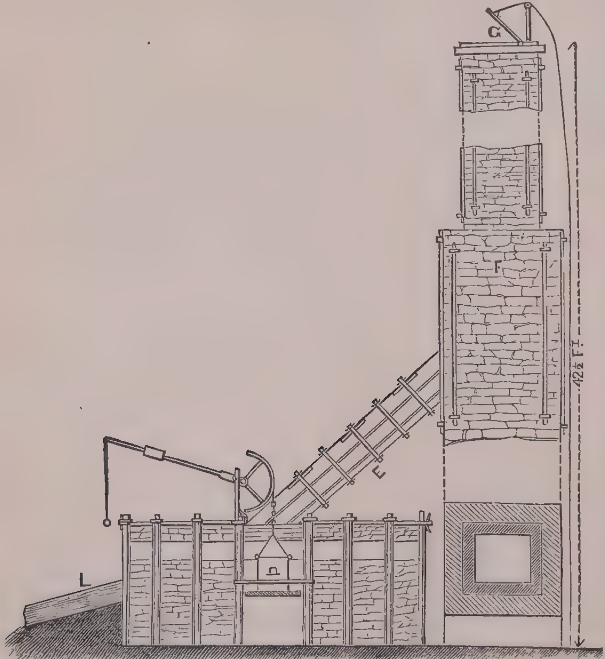

Fig. 6.—Reverberatory Furnace (elevation at flue end).

separate on the bed (which is made of closely packed sand or other infusible substances), according to their density; the lighter earthy matters forming an upper layer of slag are drawn out by the slag hole K at the flue end into an iron wagon or bogie, while the metal subsides to the bottom of the bed, and at the termination of the operation is run out by the tap hole L into moulds or granulated into water. The opposite opening M is the working door, through which the tool for stirring the charge is introduced. It is covered by a plate suspended to a lever, similar to that seen in the end elevation (fig. 6) in front of the slag hole.

According to the purposes to which they are applied, reverberatory furnaces may be classed into two groups, namely, fusion or melting furnaces, and calcining or wasting furnaces, also called calciners. The former have a very extended application in many branches of industry, being used by both founders and smelters in the fusion of metals; in the concentration of poor metallic compounds by fusion into regulus; in the reduction of lead and tin ores; for refining copper and silver; for making malleable iron by the puddling processes and welding; and for the manufacture of carbonate from sulphate of sodium in chemical works, etc. Calcining furnaces have a less extended application, being chiefly employed in the conversion of metallic sulphides into oxides by continued exposure to the action of air at a temperature far below that of fusion, or into chlorides by roasting with chloride of sodium. As some of these substances (for example, sulphide of lead and copper pyrites) are readily fusible when first heated, but become more refractory as part of the sulphur is dissipated and oxygen takes its place, it is important that the heat should be very carefully regulated at first, otherwise the mass may become clotted or fritted together, and the oxidizing effect of the air soon ceases unless the fritted masses be broken small again. This is generally done by making the bed of the furnace very long in proportion to its breadth and to the fire grate area, which may be the more easily done as a not inconsiderable amount of heat is given out during the oxidation of the ore,—such increased length being often obtained by placing two or even three working beds one above the other, and allowing the flame to pass over them in order from below upwards. Such calciners are used especially in roasting zinc blende into oxide of zinc, and in the conversion of sulphides of copper into chlorides in the wet extraction process. In some processes of lead smelting, where the minerals treated contain sand, the long calciner is provided with a melting bottom close to the fire-place, so that the desulphurized ore leaves the furnace as a glassy slag or silicate, which is subsequently reduced to the metallic state by fusion with fluxes in blast furnaces.

Muffle Furnaces.—A third class of furnaces are so arranged that the work is done by indirect heating; that is, the material under treatment, whether subjected to calcination, fusion, or any other process, is not brought in contact either with fuel or flame, but is raised to the proper temperature by exposure in a chamber heated externally by the products of combustion. These are known as muffle or chamber furnaces; and by supposing the crucibles or retorts to represent similar chambers of only temporary duration, the ordinary pot melting air furnaces, and those for the reduction of zinc ores or the manufacture of coal gas, may be included in the same category. These are almost invariably air furnaces, though sometimes air under pressure is used; as for example in the combustion of small anthracite coal, where a current of air from a fan-blower is sometimes blown under the gate to promote combustion.

Crucible Melting Furnaces.—Figs. 7 and 8 represent a series of one of the simplest furnaces of this class, the ordinary crucible air furnace, or *pot melting hole*, according to the Sheffield term used in cast-steel works. It is a chamber of brickwork *a*, either straight in the sides or more generally somewhat barrel-shaped, with a grate at the bottom, and of sufficient capacity to hold one or two crucibles *b*, containing from 50 to 70 ℔ weight of steel each, enough room being left around them for coke to bring the contents up to the melting point in five or six hours. The crucibles are supported upon disks, or "cheeses" of fire-brick placed upon the grate; the draught is maintained by a chimney *c* about 30 feet high, communicating with the furnace by a short flue near the top of the latter. The furnace is placed nearly or quite level with the floor of the casting shop *f*, and covered with a square fire tile or quarry *g*, set in an iron frame with a projecting handle, the fire grate being accessible from the cellar below.

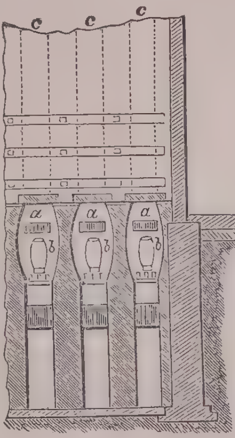

Fig. 7.—Crucible Melting Furnace (longitudinal section).

Assayers' Muffle Furnace.—The construction of a muffle furnace as used by assayers has already been described in the article ASSAYING, vol. ii. p. 635. It is simply a square air furnace with a D-shaped chamber of fire-clay fixed in the middle, so as to be surrounded with incandescent fuel, a current of air being drawn through it by a series of draught holes or slits in the roof or sides. Larger-sized muffles are used by enamellers and painters, and in the production of enamelled iron goods, as well as for calcining minerals containing arsenic where it is to be collected for sale, and in the production of metallic colors where the material has to be kept free from the influence of flame and smoke.

Furnace Materials.—The materials used in the construction of furnaces are divisible into two classes, namely, ordinary, and refractory or fire-resisting. The former are used principally as casing, walls, pillars, or other supporting parts of the structure, and include ordinary red or yellow bricks, clay-slate, granite, and most building stones; while the latter are reserved for the parts immediately in contact with the fuel and flame, such as the lining of the fire place, the arches, roof, and flues, the lower part if not the whole of the chimney lining in reverberatory furnaces, and the whole of the internal walls of blast furnaces.[1] Among such substances are fire-clay and fire-bricks, certain sand-stones, silica in the form of ganister, and Dinas stone and bricks, ferric oxide and alumina, carbon (as coke and graphite), magnesia, lime and oxide of chromium—their relative importance being indicated by their order, the last two or three indeed being only of limited use.

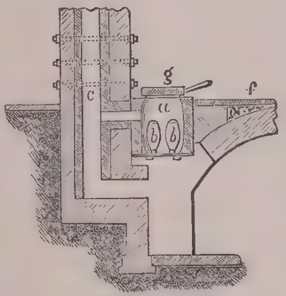

Fig. 8.—Crucible Melting Furnace (transverse section).

The most essential point in good fire-clays, or in the bricks or other objects made from them, is the power of resisting fusion at the highest heat to which they may be exposed. This supposes them to be free from metallic oxides, forming easily fusible compounds with silica, such as lime or iron, the presence of the former even in comparatively small proportion being very detrimental. As clays they must be sufficiently plastic to be readily moulded, but at the same time possess sufficient stiffness not to contract too strongly in drying, whereby the objects produced would be liable to be warped or cracked before firing. In most cases, however, the latter tendency is guarded against, in making up the paste for moulding, by adding to the fresh clay a certain proportion of burnt material of the same kind, such as old bricks or potsherds, ground to a coarse powder. Coke dust or graphite is used for the same purpose in crucible making.

The most highly valued fire-clays are derived from the Coal Measures. Among the chief localities are the neighborhood of Stourbridge in Worcestershire and Stannington near Sheffield, which supply most of the materials for crucibles used in steel and brass melting, and the pots for glass houses; Newcastle-on-Tyne, and Glenboig near Glasgow, where heavy blast furnace and other fire-bricks, gas retorts, etc., are made in large quantities. Coarse-grained but very strong fire-bricks are also made of the waste of the china clay works at Lee Moor, Devon. See FIRE-CLAY.

In Belgium, the clay raised at Andenne is very largely used for making retorts for zinc furnaces, not for local use alone, as it is exported for the same purpose to England and other countries. The principal French fire-clays are derived from the Tertiary strata in the south, and more nearly resemble porcelain clays than those of the Coal Measures. They give wares of remarkably fine texture and surface, combined with high refractory character. The principal centre of manufacture is in Paris, where small crucibles, tubes, furnaces, and other articles for the use of assaying and chemical laboratories, as well as for gold and silver refining, are produced in large quantities.

In Germany, Ips and Passau on the Danube, and Gross Almerode in Hesse, are the best known localities producing fire-clay goods, the crucibles from the last-mentioned place, known as Hessian crucibles, going all over the world. These, though not showing a great resistance to extreme heat, are very slightly affected by sudden alternations in heating, as they may be plunged cold into a strongly heated furnace without cracking, a treatment to which French and Stourbridge pots cannot be subjected with safety. The Cornish crucibles used in copper assaying, made at Redruth, are generally similar in quality and behavior to the Hessian, but are not quite so rapidly perforated by corrosive fluxes.

Plumbago or graphite is largely used in the production of crucibles, not in the pure state but in admixture with fire-clay; the proportion of the former varies with the quality from 25 to nearly 50 per cent. These are the most enduring of all crucibles, the best lasting out 70 or 80 meltings in brass foundries, about 50 with bronze, and 8 to 10 in steel melting. The most important manufactory is that of the Patent Plumbago Crucible Company, Battersea, on the Thames, where the best Ceylon graphite is the basis of the composition employed. They are also made in all the principal crucible works of the continent of Europe and in the graphite-producing localities of Canada and the United States.

Silica is used in furnace-building in the forms of sand, ganister, a finely-ground sandstone from the Coal Measures of Yorkshire, and the analogous substance known as Dinas clay, which is really nearly pure silica, containing at most about 2½ per cent. of bases. Dinas clay is found at various places in the Vale of Neath in South Wales, in the form of a loose disintegrated sandstone, which is crushed between rollers, mixed with about 1 per cent. of lime, and moulded into bricks that are fired in kilns at a very high temperature. These bricks are specially used for the roof, fire arches, and other parts subjected to intense heat in reverberatory steel melting furnaces, and although infusible under ordinary conditions, are often fairly melted by the heat without fluxing or corrosion after a certain amount of exposure. Ganister, a slightly plastic siliceous sand, is similarly used for the lining of Bessemer steel converters; it is found in the neighborhood of Sheffield.

Alumina as a refractory material is chiefly used in the form of an hydrated aluminous iron ore known as bauxete, found in the south of France, in Carniola, and in Antrim; but its applications are somewhat special. It has been found to stand well for the linings of rotatory puddling furnaces, where, under long-continued heating, it changes into a substance as hard and infusible as natural emery. In the Paris Exhibition of 1878 bricks very hard and dense in character, said to be of pure alumina, were exhibited by Muller & Co. of Paris, as well as bricks of magnesia, the latter being specially remarkable for their great weight. They are intended for use at the extreme temperatures obtainable in steel furnaces, or for the melting of platinum before the oxy-hydrogen blowpipe. For the latter purpose, however, lime is generally used; but as this substance has only small stability, it is usually bedded in a casing of fire-brick. Fig. 9 is a section of a lime furnace as used for platinum melting. The flame of the gas jet is introduced through

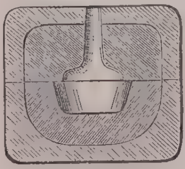

Fig. 9.—Section of Lime Furnace.

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[1] In the figures fire-brick work is represented by closer, and casing walls in ordinary bricks by more open shading.

the hole at the top, and plays over the surface of the metal in the hollow below. Oxide of chromium and chromic iron ore have been proposed as refractory crucible materials by Andouin of Paris. The former may be used as a bed for melting platinum in the same way as lime or magnesia, without affecting the quality of the metal.

Ferric oxide, though not strictly infusible, is largely used as a protecting lining for furnaces in which malleable iron is made, a portion of the ore being reduced and recovered in the process. In an oxidizing atmosphere it is indifferent to silica, and therefore siliceous bricks containing a considerable proportion of ferric oxide, when used in flues of boilers, brewers' coppers, etc., and similar situations, are perfectly fire-resisting so long as the heated gas contains a large proportion of unconsumed air. The red fire-bricks known as Windsor bricks, which are practically similar in composition to soft red sandstone, are of this character.

Furnace Construction.—In the construction of furnaces provision has to be made for the unequal expansion of the different parts under the effect of heat. This is especially necessary in the case of reverberatory furnaces, which are essentially weak structures, and therefore require to be bound together by complicated systems of tie rods and uprights or buck staves. The latter are very commonly made of old flat bottom rails, laid with the flat of the flange against the wall. Puddling furnaces are usually entirely cased with iron plates, and blast furnaces with hoops round each course of the stack, or in those of thinner constructions the fire-brick work is entirely enclosed in a wrought iron casing or jacket. Such parts as may be subjected to extreme heat and the fretting action of molten material, as the tuyere and slag breasts of blast furnaces, and the fire bridges and bed plates of reverberatory furnaces, are often made in cast iron with double walls, a current of water or air being kept circulating through the intermediate space. In this way the metal, owing to its high conductivity and low specific heat as compared to that of water, is kept at a temperature far below its melting point if the water is renewed quickly enough. It is of course necessary in such cases that the circulation shall be perfectly free, in order to prevent the accumulation of steam under pressure in the interior of the casting. This method has received considerable extension of late years, notably in furnace-smelting of iron ores containing manganese, where the entire hearth is often completely water-cased, and in some lead furnaces where no fire-brick lining is used, the lower part of the furnace stack being a mere double iron box cooled by water sufficiently to keep a coating of slag adhering to the inner shell, which prevents the metal from being acted upon.

Furnaces with special Methods of Firing.—In the examples hitherto noticed, the use of solid fuel has alone been considered, whether in admixture with the charge in blast furnaces or burnt upon a grate in reverberatory furnaces. In either case the useful heating effect realized is considerably below that indicated as possible by theory, and for the same reason, namely, that the carbon factor of the fuel is to a considerable extent only partially oxidized, producing carbonic oxide CO, instead of carbonic acid CO_2, as it should do if the combustion were complete. This is attended with great loss of heat, unless steps be taken to ensure the subsequent combustion of the carbonic oxide, by bringing it into contact with more air at an appropriate temperature. The production of carbonic oxide is a necessary consequence where coal is used in large masses, the carbonic acid in the gases resulting from complete combustion at any spot being reduced more or less completely to carbonic oxide by contact with the ignited carbon immediately adjacent. To obtain the most perfect combustion it is, therefore, essential that the layer of fuel upon the bars in a grate fire should be as thin as is consistent with preventing the passage of an undue amount of air, which is attended with a strong cooling effect. This condition is, however, only possible in such furnaces as require an oxidizing atmosphere, as, for example, boiler fires and the different forms of calciners.

Coal-Dust Furnace.—A special method of providing more intimate contact between air and fuel has been adopted in a furnace designed by Mr. T. R. Crampton, who grinds the whole of the coal to a fine powder in a flour mill, and propels a current of coal dust and air, mixed in the right proportion for burning, into the combustion chamber representing the fire place of an ordinary furnace, either by a fan blower or by chimney draught. In the special application of welding iron considerable economy has been obtained with this furnace over ordinary coal-firing, but its use has up to the present time been exceedingly limited.

Gas Furnaces.—A more general remedy has been found in what is known as gas-firing, where the whole of the fuel is of design first imperfectly burned, *i.e.*, converted into carbonic oxide or rather into a mixture of carbonic oxide and nitrogen, by reducing the supply of air through the grate to a minimum and completing the combustion on the fire bridge by a further supply of air introduced through special channels either at ordinary atmospheric temperature or artificially heated. In this case, the fire place proper is replaced by a *gas-producer* or *gazogene*, which may either form one construction with the other parts of the furnace or be separated from them. Fig. 10 represents a gas-producer intended for heating retort furnaces in gas works. The coal is charged into a deep barrel-shaped stack *a*, terminated below by a small inclined grate *b*, with flat bars placed edgewise like the steps of a ladder or the laths of a Venetian blind, allowing sufficient air to pass between for a smothered combustion, the gases produced passing out by the large flue *c*. The charging hole *d* is covered by a closely fitting valve making a gas-tight joint, the escape of gas being prevented by the great thickness of coal above the flue and the strong draught in the latter. From the exceedingly poisonous nature of carbonic oxide it is of the utmost importance to prevent the issue of unburnt gas; and if this cannot be prevented, the escape must be fired when the charging hole is opened. This is regularly done in blast furnaces working with gas-collecting flues, and even the native iron-smelters of India, in starting their small furnaces with stacks only a few feet high, observe the same precaution. Another point of equal importance is to prevent the access of air to the gas anywhere except at the point of ignition. Any leakage of air into the gas flues must as a rule produce explosion. An ingenious and efficacious method of establishing the draught in gas-producers is adopted by Dr. C. W. Siemens. The gas delivery tube rises to a certain height, is then laid horizontal for a short distance, and finally descends vertically to the original level. The gas in passing along the horizontal tube loses heat by radiation, and on arriving at the downward tube is sensibly denser than when it started, so that the second vertical tube acts as siphon and maintains constant exhaust on the producer. In some cases the gases from the fuel are modified in composition by an injection of steam from a pipe below the grate *e* (fig. 10), which, impinging upon ignited coal, is decomposed into hydrocarbon and carbonic oxide gases. This transformation is necessarily attended with considerable cooling effect, from the

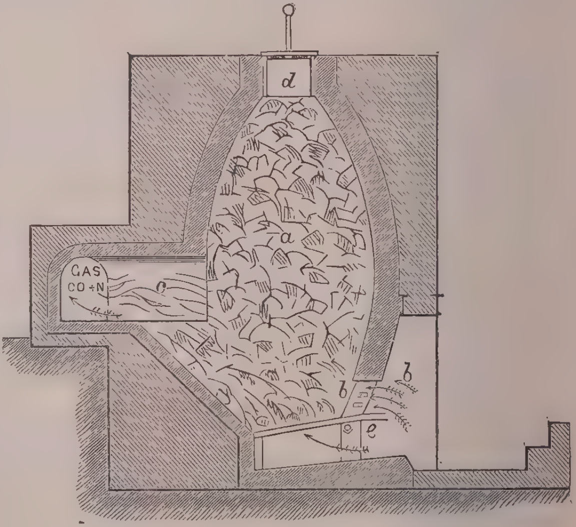

Fig. 10.—Gas-producer (transverse section).

large amount of heat expended in the decomposition of water, so that the method is only of limited application; but the "richness" or fuel value of the gases is very considerably increased by its use. It is more particularly of value with dry or anthracite coals. The gas-producer is used with advantage with very inferior fuels, such as peat, lignite, sawdust, etc., containing much ash and water, and if the latter be removed by passing the crude gas through a condenser, according to the method adopted by Lundin in Sweden, the poorest material, such as wet sawdust, may be employed for puddling and steel melting, operations that require the highest attainable temperatures.

Mechanical Furnaces.—The introduction and withdrawal of the charges in fusion furnaces is effected by gravitation, the solid masses of raw ore, fuel, and flux being thrown in at the top, and flowing out of the furnace at the taphole or slag run at the bottom. Vertical kilns, such as those used for burning limestone and iron ores, are worked in a similar manner,—the raw stone going in at the top, and the burnt product falling through holes in the bottom when allowed to do so. With reverberatory calciners, however, where the work is done upon a horizontal bed, a considerable amount of hand labor is expended in raking out the charge when finished, and in drawing slags from fusion furnaces; and more particularly in the puddling process of refining iron the amount of manual exertion required is very much greater. To diminish the item of expenditure on this head, various kinds of mechanical furnaces have been adopted, all of which can be classified under three heads of gravitating furnaces, mechanical stirrers, and revolving furnaces.

1. In *gravitating furnaces* the bed is laid at a slope just within the angle of repose of the charge, which is introduced at the upper end, and is pushed down the slope by fresh material, when necessary, in the contrary direction to the flame which enters at the lower end. This method is used in Styria for burning the dust of spathic iron ore which cannot be put into the kilns with the large lumps. The fuel used is blast furnace gas, the calciners being directly over the furnace top. Gerstenhofer's pyrites burner, another furnace of this class, has a tall vertical chamber heated from below, and traversed by numerous narrow horizontal cross bars at different heights. The ore in fine powder is fed in at the top, through a hopper, in a regular thin stream, by a pair of rollers, and in falling lodges on the flats of the bars, forming a talus upon each of the height corresponding to the angle of rest of the material, which is, however, at short intervals removed to lower levels by the arrival of fresh ore from above. In this way a very large surface is exposed to the heat, and the ore, if containing sufficient sulphur to maintain the combustion, is perfectly burned when it arrives at the bottom; if, however, it is imperfectly sized or damp, or if it contains much earthy matter, the result is not very satisfactory. Stetefeld's furnace, used for the conversion of sulphuretted silver ores into chlorides, is of a somewhat similar character. It is now largely used in the silver mines of the western States of America.

2. *Mechanical stirrers* constitute a second division of mechanical furnaces, in which the labor of rabbling or stirring the charges is performed by combinations of levers and wheel-work taking motion from a rotating shaft, and more or less perfectly imitating the action of hand labor. They are almost entirely confined to puddling furnaces, and have not been very generally adopted for these.

3. *Revolving furnaces*, the third and most important division of mechanical furnaces, are of two kinds. The first of these resemble an ordinary reverberatory furnace by having a flat bed which, however, has the form of a circular disk mounted on a central shaft, and receives a slow movement of rotation from a water-wheel or other motor, so that every part of the surface is brought successively under the action of the fire, the charge being stirred and ultimately removed by passing under a series of fixed scraper arms placed above the surface at various points. Brunton's calciner, used in the "burning" of the pyritic minerals associated with tin ore, is the most familiar example of this type. The revolving hearth is also represented in Pernot and Pousard's steel-melting furnaces. In these, however, the hearth rotates on an inclined axis, so that the path of its surface is oblique to that of the flame. In the second class of revolving furnaces the working part is a hollow cylinder, between the fire place and flue, with its axis horizontal or nearly so, whose inner surface represents the working bed. It is mounted upon friction rollers, and receives motion from a special steam engine by means of a central belt of spur gearing. Furnaces of this kind were first used in alkali works for the conversion of sulphate into carbonate of sodium in the process known as black ash fusion, but have since been applied to puddling in America and elsewhere by Danks and others; but for the latter purpose they are still to some extent in the experimental stage. As calciners they are used in tin mines and for the chlorination of silver ores.

Use of Heated Air.—The calorific intensity of fuel is found to be very considerably enhanced, if the combustion be effected with air previously heated to any temperature between that of boiling water and a dull red heat, the same effect being observed both with solid and gaseous fuel. The latter, especially when brought to the burning point at a high temperature, produces a heat that can be resisted by the most refractory substances only, such as silica, alumina, and magnesia. This is attained in the regenerative furnace of Siemens, detailed consideration of which belongs more properly to the subject of iron.

Economy of Waste Heat and Gas.—In every system of artificial heating, the amount of heat usefully applied is but a small proportion of that developed by combustion. Even under the most advantageous application, that of evaporation of water in a steam boiler, where the gases of the fire have to travel through a great length of flues bounded by thin iron surfaces of great heat-absorbing capacity, the temperature of the current at the chimney is generally much above that required to maintain an active draught in the fire place; and other tubes containing water, often in considerable numbers, forming the so-called fuel economizers, may often be interposed between the boiler and the chimney with marked advantage as regards saving of fuel. In reverberatory and air furnaces used in the different operations of iron manufacture, where an extremely high temperature has to be maintained in spaces of comparatively small extent, such as the beds of puddling, welding, and steel-melting furnaces, the temperature of the exhaust gases is exceedingly high, and if allowed to pass directly into the chimney they appear as a great body of flame at the top. It is now general to save a portion of this heat by passing the flame through flues of steam boilers, air-heating apparatus, or both—so that the steam required for the necessary operations of the forge and heated blast for the furnace itself may be obtained without further expenditure of fuel. The most perfect method of utilizing the waste heat hitherto applied is that of the Siemens regenerator, in which the spent gases are made to travel through chambers, known as regenerators or recuperators of heat, containing a quantity of thin fire-bricks piled into a cellular mass so as to offer a very large heat-absorbing surface, whereby their temperature is very considerably reduced, and they arrive at the chimney at a heat not exceeding 300 or 400 degrees. As soon as the bricks have become red hot, the current is diverted to an adjacent chamber or pair of chambers, and the acquired heat is removed by a current of cool gas or air passing towards the furnace, where it arrives at a temperature sufficiently high to ensure the greatest possible heating effect in combustion. This system being alternative, four regenerators, two for air and two for gas, are required for each furnace; but in some of the newer French patterns of so-called recuperative furnaces, a system of tubular bricks is adopted in the chambers and only the air is heated, the gas being brought hot from the producer to the furnace instead of cooling it first by atmospheric exposure in a long tube in the manner adopted by Siemens. This allows a considerable simplification in the apparatus; only a single regenerator is required working continuously, the flame travelling outwards through one set of passages in the bricks and the air inwards through another; and as the former consists only of burnt gases, no explosion can take place if a communication be established between the two currents through a leaking joint or broken brick.

In iron-smelting blast furnaces the waste gases, though not escaping at as high sensible temperatures as those of the furnaces previously considered, are of considerable fuel value, and may render important services if properly applied. Owing to the conditions of the work, which require the maintenance of a sensibly reducing atmosphere, they contain a very notable proportion of carbonic oxide, and are drawn off by large wrought-iron tubes near the top of the furnace and conveyed by branch pipes to the different boilers and air-heating apparatus, which are now as a rule

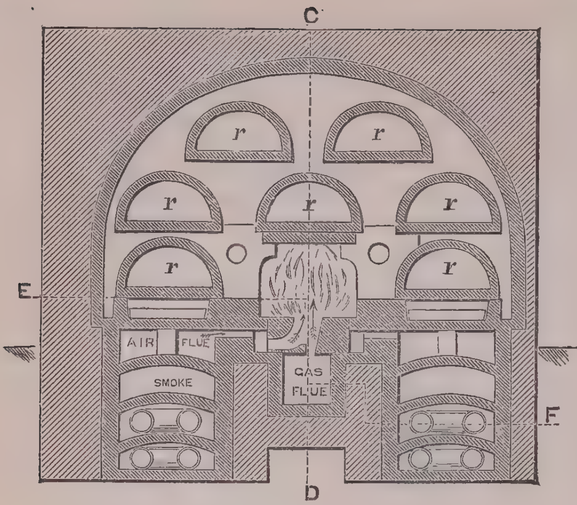

Fig. 11.—Gas-heated Retort Furnace (transverse section on A B fig. 13).

entirely heated by the combustion of such gases. Formerly they were allowed to burn to waste at the mouth of a short chimney place above the furnace top, forming a huge body of flame, which was one of the most striking features of the Black Country landscape at night, but is now less commonly seen than formerly. Perhaps the greatest number of flaming furnaces to be seen at present are those of the Scotch founding iron district about Gartsherrie, Coatbridge, etc.

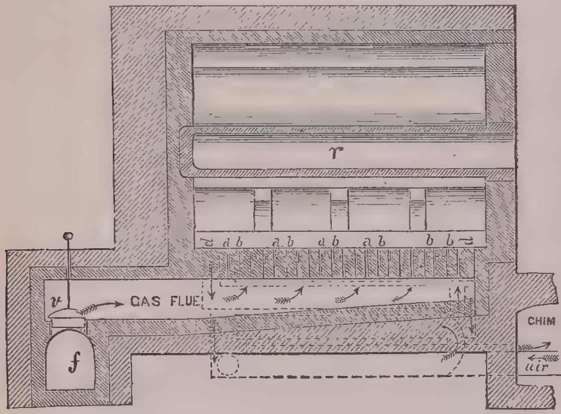

Fig. 12.—Gas-heated Retort Furnace (longitudinal section on C D fig. 11).

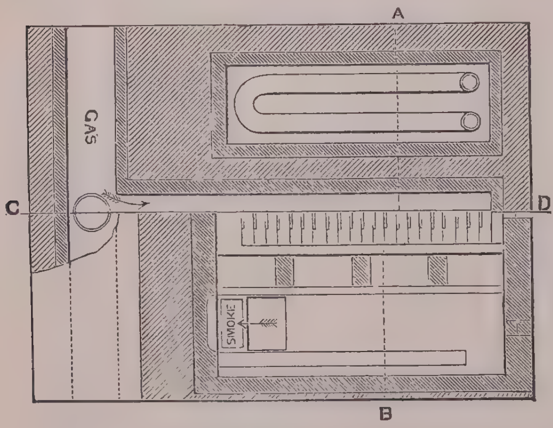

Fig. 13.—Gas-heated Retort Furnace (horizontal section on E F fig. 11).

Figs. 11, 12, and 13 represent a modern furnace heated by gas burnt with hot air as applied to heating gas retorts. The retorts of fire clay *r r r*, seven in number, are mounted upon supports at both ends in an arched chamber having a long flue running along the centre line at the bottom, covered with bricks pierced at intervals by narrow slits *a a a*, which form the gas admission passages from the gas-producer flue *f*, the supply being regulated by a valve *v*. These alternate with similar slits *b b* of less depth, communicating with a lateral flue, supplying heated air; the mixture being effected at a great number of points ensures uniformity of combustion along the whole length of the furnace. The flame, after heating the retorts, descends by passages under the ends of the side retorts in the lower series to a number of arched divisions in the substructure containing the air-heating-pipes, which are of cast iron in horseshoe coils. By this means the temperature of the gases is considerably reduced by the time they reach the chimney flue, the heat intercepted being returned by the air to the combustion chamber.

Laboratory and Portable Furnaces.—Small air-furnaces with hot plates or sand bath flues were formerly much employed in chemical laboratories, as well as small blast furnaces for crucibles heated with charcoal or coke. The use of such furnaces has very considerably diminished, owing to the general introduction of coal gas for heating purposes in laboratories, which has been rendered possible by the invention of the Bunsen burner, in which the mixture of air and gas giving the least luminous but most powerfully heating flame is effected automatically by the effluent gas. These burners, or modifications of them, have also been applied to muffle furnaces, which are convenient when only a few assays have to be made—the furnace being a mere clay shell and soon brought to a working temperature; but the fuel is too expensive to allow of their being used habitually or on a large scale. Petroleum, or rather the heavy oils obtained in tar refineries, having an equal or superior heating power to coal gas, may also be used in laboratories for producing high temperatures. The oil is introduced in a thin stream upon a series of inclined and channelled bars, where it is almost immediately volatilized and burnt by air flowing in through parallel orifices. Furnaces of this kind may be used for melting cast-iron or bronze in small quantities, and were employed by M. St. Claire Deville in experiments in the metallurgy of the platinum group of metals.

Sefstrom's blast furnace, used in Sweden for the assay of iron ores, is one of the most convenient forms of portable furnaces applied to melting in crucibles. It consists of a sheet-iron cylinder about 8 or 9 inches in diameter, within which is fixed one of smaller size lined with fire-clay, as shown in part section in fig. 14. The space between the two cylinders serves as a heater and distributor for the blast, which is introduced through the nozzle at the bottom, and enters the furnace through a series of several small tuyeres arranged round the inner lining. Charcoal is the fuel used, and the crucibles stand upon the bottom of the clay lining. When a large body of fuel is required, the cylinder can be lengthened by an iron hoop which fits over the top ring. Deville's portable blast furnace is very similar in principle to the above, but the body of the furnace is formed of a single cast-iron cylinder lined with fire-clay, closed below by a cast-iron plate perforated by a ring of small holes—a hemispherical basin below forming the air-heating chamber.

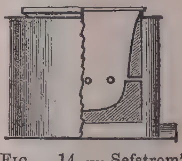

Fig. 14. — Sefstrom's Portable Blast Furnace.

The literature of furnaces is co-extensive with that of metallurgy. Most of the different patterns in use will be found described and fully illustrated in Percy's and Phillip's *Metallurgy*, Jordan's *Album du cours de Métallurgie*, etc. The atlas to Karsten's great work, and the plates in the *Encyclopédie Méthodique*, are also of much interest, but the types of apparatus represented are chiefly antiquated and out of use. (H. B.)

FURNITURE is the name, of obscure origin, used to describe the chattels and fittings required to adapt houses, churches, ships, etc., for use. The sculptures, paintings, and metal work of antiquity, of the Middle Ages, and of the Renaissance, now kept in museums and private collections, have, with few exceptions, formed part of decorations or of furniture made for temples, churches, or houses. Most of our ancient bronzes, if not images taken from ancient shrines, are pieces of mirrors, tripods, altar vessels, even the dishes and pans of the kitchen. Wood, ivory, precious stones, bronze, silver, and gold have been used from the most ancient times in the construction or for the decoration of seats, chests, tables, and other furniture, and for the shrines and altars of sacred buildings.

The kinds of objects required for furniture have varied according to the changes of manners and customs, as well as with reference to the materials at the command of the workman, in different climates and countries. Of the furniture of the ancient Egyptians there remain several examples. The British Museum contains six chairs, about the same in height as those now used. One is of ebony, turned in the lathe and inlaid with collars and dies of ivory. It is low with a back; and both back and legs are strengthened with rails of cane. The seat is of plaited cane slightly hollowed. Another is shaped out of two frames of four pieces of wood each, hinged in the centres of the longer sides, the lower ends carved into the form of the heads of animals; the seat has been made of skin or other flexible material so as to fold flat. Some Egyptian couches and seats had the legs carved like those of panthers; some had the arms or seat supported by figures representing slaves or captives taken in war. They were upholstered with rich stuffs and are accurately represented in wall paintings (see the great French work, *Description de l'Égypte*). Workmen's tables, massive blocks of wood with four plain legs, and head rests hollowed out, standing 9 or 10 inches high, are preserved in the British Museum,—some being of alabaster, probably for the sake of coolness. Painted wooden chests, with convex lids (not hinged), and mummy cases can be seen both in the British Museum and in the Louvre in Paris.

The excavations of Nineveh have brought to light sculptured representations of Assyrian seats. They were massive, the ends of the seat frame projected in the shape of rams' heads; in some instances figures of captives support the arms; in one described by Sir A. H. Layard, two horses resting on the lower bars from front to back support the seat. The seats were cushioned or upholstered with rich materials. An elaborate piece of carved ivory, with depressions to hold colored glass, agate, etc., from Nineveh, now in the British Museum, has been inlaid into a throne, —showing that such objects were sometimes richly decorated. The carving is apparently of Egyptian origin. The furniture of the Assyrians was more massive, and less varied and elegant in execution, than that of the Egyptians.

Greek seats (*thronoi*) are sculptured in the Parthenon frieze now in the British Museum. They resemble turned wood structures, though perhaps representing bronze. The arms are low and straight, and the backs upright. A curious chair of this kind is represented on one of the bas-reliefs from Xanthus (British Museum). In the same collection will be seen statues seated in chairs framed in square bars, the horizontal pieces mortised into the upright, and these details are carefully represented in marble. Certain far-famed gold and ivory statues of colossal size, at Olympia and other places, were represented seated. The bars and frames of the chairs, and of the footstools and pedestals, were constructed of cedar wood, colored and inlaid with plates of sculptured ivory, and of gold and other precious materials. A sacred chest with carved lid, a table covered with ivory carvings, and other objects in these shrines are described by Pausanias. Unfortunately we have but his verbal accounts of them (see Q. de Quincy, *Jupiter Olympien*, in which careful engravings are given of their probable shapes). Chairs of the shape in general use forty or fifty years ago (the front and back legs curved outwards, with a plain piece of wood curved to fit the shoulders for the top rail of the back) are not uncommon in paintings on vases. The vase rooms of the British Museum and the Louvre give frequent illustrations of chairs, couches, etc., as well as of the stuffs used in upholstering them. Sumptuous Greek furniture, during the last two centuries B. C., was made of bronze, damascened with gold and silver.

The Romans employed Greek artists and workmen. Their chairs, couches, and seats were of similar shape to those of the Greeks. During meals men reclined on couches each made to hold three persons; a low rail protected the back; three of these couches surrounded the table at entertainments, leaving the fourth side open for service. The decoration consisted of rich coverings, constantly changed to suit the season, or in honor of the guests. Women sat during meals. The *sella curulis*, a folding cross-shaped seat, was carried in the chariot, and used in the forums, baths, lecture halls, etc. It was often inlaid with ivory. *Sellæ*, square seats of bronze, were also often carried about, as well as footstools, the former raising the sitter above the heads of humbler persons. Couches, covered with tilts and curtains, could be carried by slaves, and used as litters. Four silver figures of the 4th century, representing the capital cities of the empire, now in the British Museum, are considered to have ornamented the ends of the poles or shafts of a litter. Tables were of marble, resting on sphinxes or other animals. Dining tables were of wood, curiously veneered, to which a high value was often attached. They rested on tripods or frames of four or of six legs, ornamented with figures, busts, animals, etc., in bronze. Tables were changed with each course. Tables were sometimes protected by rims or borders, sometimes rested on feet of carved ivory. Books and other property were kept in *scrinia*, round chests that could be fastened. Clothes and provisions had special rooms to hold them. In the later ages of the empire, in Rome, and afterwards in Constantinople, gold and silver were plentiful for furniture; even cooking and common house vessels were occasionally made in those metals.

The chair of St. Peter in Rome, a solid square seat, with pedimental back and panelled with carved ivory, that of St. Maximian in the cathedral of Ravenna, round backed, with arms also panelled with carved ivory, and many representations on carved ivory diptychs or tablets, will give the student a correct notion of the furniture of the divided empire. The character of the curule chair survived and may be recognized in the Bayeaux tapestry (St. Edward's seat), and in many mediæval paintings. The architectural features so prominent in much of the mediæval furniture begins in these Byzantine and late Roman thrones. These features became paramount as Pointed architecture became general in Europe, and scarcely less so during the Renaissance. Most of the mediæval furniture, chests, seats, trays, etc., of Italian make were richly gilt and painted. In northern Europe carved oak was more generally used. The coronation chair in Westminster Abbey, made for Edward I. in the 13th century, has a gabled and crocketed back, is panelled with tracery work, and rests on carved lions,—the whole gilt and painted. State seats in feudal halls were benches with ends carved in tracery, backs panelled or hung with cloths (called cloths of estate), and canopies projecting above. Bedsteads were square frames, the testers of panelled wood, and resting on carved posts. Chests of oak carved with panels of tracery, or of Italian cypress (when they could be imported), were used to hold and to carry clothes, tapestries, etc., to distant castles and manor houses; for house furniture had to be moved from place to place. A chest of the reign of John is kept in the castle of Rockingham. Many can be seen in old parish churches, and in the South Kensington Museum, the Louvre, and many other Continental galleries. Carved stalls covered by elaborate tabernacle work remain in many cathedrals and churches The Hôtel de Cluny in Paris contains numerous examples of this kind of wood work. Altars were backed by paintings in canopied frames, closed by shutters, which were also painted inside and outside. In some German churches, *e. g.*, the cathedrals of Hildesheim and of Münster in Westphalia, the entire picture (as well as the shutters) was made to open out, showing ingenious receptacles for reliquaries within. Copes and other vestments were kept in semicircular chests with ornamental lock plates and iron hinges; an example is preserved in Wells cathedral. The splendor of most feudal houses depended on pictorial tapestries which could be packed and carried from place to place. Wardrobes were rooms fitted for the reception of dresses, as well as for spices and other valuable stores. Excellent carving in relief was executed on caskets, which were of wood or of ivory, with painting and gilding, and decorated with delicate hinge and lock metal work. The general subjects of sculpture were taken from legends of the saints or from metrical romances.

Renaissance art made a great change in architecture, and this change was exemplified in furniture. Cabinets and panelling took the outlines of palaces and temples; sometimes they were actually constructed in perspective, *e. g.*, a small theatre front at Vicenza, the work of the younger Palladio. Curious internal fittings were arranged in cabinets, still following the details of architectural interiors. In Florence, Rome, Venice, Milan, and other capitals of Italy, sumptuous cabinets, tables, chairs, chests, etc., were made to the orders of the native princes. Vasari (*Lives of Painters*) speaks of scientific diagrams and mathematical problems illustrated in costly materials, by the best artists of the day, on furniture made for the Medici family. The great extent of the rule of Charles V. helped to give a uniform training to artists from various countries resorting to Italy, so that cabinets, etc., which were made in vast numbers in Spain, Flanders, and Germany, can hardly be distinguished from those executed in Italy. Francis I. and Henry VIII. encouraged the revived arts in their respective dominions. Examples of 16th century chests, cabinets, tables, seats, sideboards, etc., can be seen in museums, and in many private houses. *Pietra dura*, or inlay of hard pebbles, agate, lapis lazuli, and other stones, ivory carved and inlaid, carved and gilt wood, marquetry or veneering with thin woods, tortoiseshell, brass, etc., were used in making sumptuous furniture during the first period of the Renaissance. A folding chair of wrought iron (made at Augsburg), with numerous groups of figures in complete relief, is preserved at Longford Castle, Wiltshire. Mirrors, caskets and other objects in damascened iron (Milan) are shown in the South Kensington Museum. Subjects of carving or relief were generally drawn from the theological and cardinal virtues, from classical mythology, from the seasons, months, etc. Carved altarpieces and woodwork in churches partook of the change in style. The stalls of the cathedral of Amiens, of the Certosa of Pavia, the cathedral of Siena, and a great number of churches in Venice, Florence, Rome, Perugia, and other Italian cities, illustrate first the transition, then the full change from Gothic to classic detail in ecclesiastical furniture.

The elegance of form and perfection of detail, which are noticeable in the furniture of the 16th century, declined during the 17th all over Europe. The framework became bulky and heavy, and the details coarse. Silver furniture was made in considerable quantities by the Spaniards in Spain and Italy, and it was used in the courts of the French and English kings. A few examples of silver tables, mirrors, etc., now in Windsor Castle and at Knole, in Kent, are reproduced in electrotype in the South Kensington Museum. To this period belongs the name of André Charles Boule, who furnished the palace of Versailles. He invented or perfected a beautiful system of veneering with brass and tortoiseshell, brass and ebony, occasionally using white metal besides. Examples of this buhl or boule are shown in the Apollo gallery of the Louvre.

The system of veneering, or coating common wood with slices of rare and costly woods, fastened down with glue by screw presses made to fit the surface to be covered, came into general use in the 18th century. Marquetry is veneer of different woods, forming a mosaic of pictorial or ornamental designs. In Italy, in Spain, and throughout the dominions of Charles V. and his successors, figure subjects, architectural views, and quaint interiors were represented in these materials. Usually two or three woods were employed; they were tinted by means of heated sand in iron frames, and the tints graduated to the utmost nicety. Sometimes these effects were produced by splitting and laying slices of the same wood with the grain running in different directions. The fine marquetry of the last century was made of tulip wood or mahogany, with lime, pear, holly, beech, and other light-colored woods; sometimes in ebony and ivory in Italy particularly; or ebony and mother-of-pearl, the latter in Holland. Woods were occasionally stained green, blue, and other colors, but these tints were sparingly employed by the more famous makers. Curiously grained specimens of mahogany, known as letter wood and by other names, were used for veneering late in the century by the *ciseleurs* or makers of rich brass and gilt metal edgings, which that wood shows off to perfection. The golden-colored satin wood, which was imported towards the end of the last century, was much used as a ground in English marquetry.

Looking-glasses in large sheets began to be exported from Venice at the end of the 17th century; some were engraved with figures on the backs. The manufacture was established at Tourlaville, then in Paris, and about the same time at Battersea on the Thames—under Government protection in both countries. The light fantastic frames which came into fashion in France were called *rococo* (from *roquaille*, *coquaille*, rock and shell work). Carved and gilt furniture was made in Italy, where it was best designed, and all over Europe till late in the 18th century. Robert Martin, who used fine lac polish, gave the name of "Vernis Martin" to painted and polished furniture of all kinds, from carriages and wardrobes to fans and snuff-boxes. He died in 1763. The discovery of Herculaneum and Pompeii about the middle of the last century turned attention to the elegant designs of the Greco-Roman period. Riesener, David Roentgen (known as David), and the *ciseleur* Gouthière are well known names of French cabinet-makers; Chippendale, Lock, Sheraton, and Heppelwhite were Englishmen of the same period—the last half of the 18th century. James and Robert Adam designed beautiful satin wood and other furniture at that date. Medallions of porcelain were sometimes inlaid in cabinet fronts. Most of these manufactures came to an end during the French Revolution and the long war. The "empire" style, a stiff affected classicalism, prevailed in France during the reign of Napoleon. It is shown in the metal mounts of veneered mahogany furniture, and in the carvings of chair legs and backs.

A return has been made during recent years to mediæval designs. In England there is a going back to the fashions prevalent during the first fifty years of the last century. The elegant Louis XVI. style is more popular in France.

As regards furniture of the day, and the proprieties which ought to be observed in form and decoration, it is a matter of regret that no definite style is recognized in Europe; there cannot but be some consequent waste of power and uncertainty of aim. A few general principles, however, are held to be applicable to the shape and arrangements of furniture of whatever style.

Bedsteads are now very generally made of iron in most countries of Europe. They are plain; the portions not covered with hangings are made in brass, or coated with enamelled paint. In most cases no attempt is made to decorate them. They are clean, and easily taken to pieces and moved. They need no criticism. Bedroom furniture is no longer as rich or costly as when it was the fashion to include state bed-chambers among suites of rooms thrown open for the entertainment of guests. Wardrobes, chests of drawers, toilet tables, are only required to be of suitable size, and as conveniently arranged inside as possible, in order that light and heavy objects may be put away so as to be got at with the least possible exertion. Such pieces of furniture should have no projections of cornices or ornaments which do but take up space. Light-colored woods, with the simplest decorations, are preferred, on account of their freshness and cheerfulness. Common timber, such as pine, ash, oak, maple, etc., French polished, with colored lines sparingly employed, are much used by London makers for bedroom furniture; but they are less durable than mahogany. Imitations of graining are general—indeed the practice was common even in ancient Rome. But the Japanese methods of staining, powdering with gold dust, and polishing common timber without hiding the grain, deserve adoption; and efforts have latterly been made in London to bring them into use.

Chairs.—The good construction of chairs is a test of workmanship. If the wood is well seasoned, the tenons and mortises cut with exactness, the glue hot and good, and proper pressure used in putting them together, the various parts of chairs should be as perfectly united as if the wood had grown in the form required. Sir G. Wilkinson speaks of the admirable skill of the makers of Egyptian chairs, which required no cross bars to the legs. Lightness is another requisite. Very light chairs made of white wood with plaited grass seats are made at Chiavari in Italy. Large manufactories of chairs are carried on at High Wycombe, and other places where beech timber is easily obtained. If chairs are carved, the carving should be so subordinate to the outline and the comfort of the sitter as not to interfere with the dress, or be liable to breakage from having salient points, masses, or ornaments. The mahogany carved chairs of Chippendale and Sheraton are often copied, but the repetitions have not the spirit of the originals. The slight irregularities and variations made by carvers, who never absolutely repeat themselves in a series or set of such pieces, save them from the monotony so often seen in copies.

Couches.—In ancient times couches were used as actual beds. A cast of an antique bronze couch can be seen in the South Kensington Museum. The general shape has not changed in modern times. It is the chair without arms elongated or the arm chair widened. The proprieties observed in such furniture are such as are applicable to chairs. If parts of the furniture of state rooms, they are generally framed in wood, carved and gilt or painted. The seats, backs, and ends are stuffed and upholstered with rich materials, like the chairs,—the most costly material being tapestry, formerly woven in fanciful designs after Boucher, Fragonard, and other "genre" painters, in the looms of Beauvais, or, in England, of Mortlake and Soho. Such tapestries can seldom be procured now. Inferior imitations of these designs are still produced. Couches or sofas of this kind are made for conversation rather than repose, and admit of the backs being shaped in curves or carved at the top, provided that the inequalities are but slight (a rule often violated in cheap modern furniture), and the carvings so arranged as not to interfere with the comfort of sitters, or of those who may occasionally lean on them. The ends should generally be square. In rooms not intended for receptions shallow couches, with rounded ends, and awkward showy carvings on the backs, are out of place. Another kind of couch, thickly stuffed on the back, ends, and seat, may be considered as the Oriental divan raised on legs. It is practically a framework of fixed cushions, intended for repose. Its excellence depends on the upholstery, as does that of the modern stuffed arm chair.

Tables.—Good workmanship and careful regard for comfort and use are absolutely necessary in making tables. They are to be firm, and easily moved, and the legs or supports out of the way of persons sitting at them; their proper ornamentation is veneer of fine grained wood, split and arranged in patterns or buhl and other marquetry. Carved and gilt tables with marble tops, made as ornaments to galleries and halls, should have the carvings so arranged as not to interfere with the general look of support, or be too liable to breakage. The same may be said of sideboards. Much skilful carving on such pieces is either too close an imitation of nature, and looks as if it were hung on, not part of, the structure, or is crowded and not arranged in parts in which it would be subordinate to leading lines of division, panels, borders, etc.

Cabinets.—Cabinet fronts are flat, with metal edgings, or shallow and delicate carvings; or they are subdivided by architectonic members, columns, deep mouldings, etc. In divisions protected by these salient features carvings of regular figure compositions are in place. The interiors may be subdivided into any varieties of quaint and ingenious drawers and receptacles. It is to cabinets that the greatest skill is devoted. The perfect fitting of small interior drawers, etc., is a test of excellence in workmanship. On cornices, brackets, and other projections, busts, figures, and carving of the finest kind can be placed effectively,—great care being taken not to break up running mouldings, cornices, and other members that mark the structure, or form lines of division. The French, and after them the Italians, are the first masters of this kind of carving. London cabinetmakers rarely attempt the figure. A cabinet by Fourdinois (No. 721·69) in the South Kensington Museum, purchased from the Exhibition of 1867, may be referred to for careful observation of these proprieties; even the mouldings of the panelling are covered with carving, but so delicate as not to interfere with their general outlines or surfaces. An example of flat carving may also be seen in a Flemish 17th century ebony cabinet in the same collection (No. 1651·56). As to the proper arrangements and colors of marquetry decoration, there also the masses of the design should be symmetrical, or balanced by compensating parts where absolute symmetrical arrangement is not suitable. In marquetry, as in carving, there ought to be agreeable dispositions of lines and masses of ornament, such as will look in proportion at distances at which details are not distinguishable. The colors should be few and harmonious, even when the materials are contrasted as decidedly as ebony with ivory, or satin wood with mahogany. We may compare the crowded patterns and the garish contrasts of color of much modern marquetry with the work of Riesener. His marquetry is laid out with diapers of two woods, or with medallions and pattern work—much space being left plain. A good example is in the large secrétaire now in the Louvre, signed and dated 1769. The same may be said of Chippendale's furniture, and of that in satin wood designed by the brothers Adam in the last century.

The manufacture of furniture is, to a great extent, in the hands of large factories both in England and on the Continent. Owing to the necessary subdivision of labor in these establishments, each piece of furniture passes through numerous distinct workshops. The master and a few workmen formerly superintended each piece of work, which, therefore, was never far removed from the designer's eye. Though accomplished artists are retained by the manufacturers of London, Paris, and other capitals, there can no longer be the same relation between the designer and his work. Many operations in these modern factories are carried on by steam. Even the carving of copies and repetitions of busts, figures, and ornaments is done in some instances by a special machine. This, though an economy of labor, entails loss of artistic effect. The chisel and the knife are no longer in such cases guided and controlled by the sensitive touch of a human hand.

Collections of Furniture.—1. *Antique.*—British Museum; Louvre; Vatican; Royal Museum, Naples. 2. *Mediæval and 16th century.*—Musée de Cluny, Paris; S. Kensington Museum; Sauvageot Collection, Louvre; National Museum, Nuremberg; Museum of Madrid. 3. *18th century.*—Louvre Galleries; collection of Sir R. Wallace, Manchester Square, London. Fine examples have been exhibited from Windsor Castle. Carriages, in the royal palaces at Lisbon and Vienna.

Books.—*Description de l'Égypte*; Wilkinson, *Ancient Egyptians*; Layard, *Nineveh*, etc.; Hamilton's *Vases*; Wright's *Homes of our Forefathers*; Agincourt, *Histoire de l'Art*; Du Sommerard, *Arts Somptuaires*; Viollet-le-Duc, *Dictionnaire du Mobilier*; Jacquemart, *History of Furniture*; Pollen, *Furniture and Woodwork*, where references to books will be found, and notes on materials and construction. (J. H. P.)

FURRUCKABAD. See FARRAKHÁBÁD.

FÜRST, JULIUS (1805–1873), Orientalist, was born of Jewish parents at Zerkowo in Posen, 12th May, 1805. His friends designed him for the rabbinical profession, and at a very early age he had gained an extensive acquaintance both with Biblical and with Talmudical Hebrew. In his fifteenth year he entered the Berlin gymnasium, whence he passed to the university in 1825; but straitened circumstances compelled his return to Posen, long before the completion of his studies. He then taught for some time in the Jewish school at his native place, with the result that he experienced a growing feeling of repugnance to what was then regarded as rabbinical orthodoxy. In 1827 he was able to resume a university career at Breslau, where he studied theology and Oriental philology; and in 1831 he removed to Halle, where he heard the lectures of Gesenius, Wegscheider, and Tholuck. He ultimately fixed his residence in Leipsic, where, after having taught privately for some years, he obtained an appointment as lecturer in the university in 1839. From the year 1864 till his death, which occurred on the 9th of February, 1873, he held the rank of professor. In 1835 he published the first part of the *Lehrgebäude der aramäischen Idiome*, a work which he did not live to complete; and from 1837 to 1840 he was engaged upon his *Concordantiæ*, an admirable edition of Buxtorf's Hebrew and Chaldee Concordance, with valuable appendices, in the preparation of which he was largely assisted by Delitzsch. In 1851 appeared the *Hebräisches u. Chaldäisches Handwörterbuch*, which reached a third edition in 1876, and which has been translated into English by Dr. Samuel Davidson (4th edition, 1871). Though a work of considerable merit, this cannot on the whole be said to have superseded that of Gesenius. In particular its philological theories, and its method of reducing triliteral to biliteral roots, are not likely to meet with general acceptance among scholars. His *Geschichte des Karäerthums* appeared in 1865; and the *Geschichte der Biblischen Literatur und des jüdisch-hellenischen Schriftthums*, begun in 1867, was completed in 1870. Fürst also edited a valuable *Bibliotheca Judaica* (1849–1863), and was the author of some other works of minor importance. From 1840 to 1851 he was also editor of *Der Orient*, a journal devoted to the language, literature, history, and antiquities of the Jews.

FÜRSTENBERG, the name of two noble houses of Germany.

I. The more important is in possession of a mediatized principality in the district of the Black Forest and the Upper Danube, which comprises the countship of Heiligenberg, about 7 miles to the N. of the lake of Constance, the landgravates of Stühlingen and Baar, and the lordships of Jungnau, Trochtelfingen, Hausen, and Möskirch or Messkirch. The territory is discontinuous; and as it lies partly in Baden, partly in Würtemberg, and partly in the Prussian province of Sigmaringen, the head of the family is an hereditary member of the first chamber of Baden and of the chamber of peers in Würtemberg and in Prussia. The relations of the principality with Baden are defined by the treaty of May, 1825, and its relations with Würtemberg by the royal declaration of 1839. The *Stammort* or ancestral seat of the family is Fürstenberg in the Black Forest, about 13 miles N. of Schaffhausen, but the principal residence of the present representatives of the main line is at Donaueschingen. The Fürstenbergs are descended from the counts of Urach, in the valley of the Ems, to the east of Tübingen,—Henry I., the youngest son of Egon VI. of Urach, ranking as the founder of the family. He was born about 1215, signalized himself as a supporter of the house of Hapsburg (which in the person of Rudolf, a relative of his own, ascended the throne in 1273), and died in 1284. On the death of Frederick III. in 1559, the family broke up into two lines, the Heiligenberg and the Kinzigerthal. To the former, which became extinct in 1716, belonged the well-known William Egon of Fürstenberg, who, in spite of his elevation to the rank of elector by the emperor Leopold, played into the hands of the French, had to leave Germany, and as a reward for his services was made archbishop of Strasburg in 1682. The latter furnished a large number of military and diplomatic servants to the German states. The various possessions of the family were united in 1744 under Joseph William Ernest, who was born in 1699 and died in 1762; and to him his descendants were indebted for the right that they all possess of taking the title of prince. On the failure of the male issue of his elder son in 1804, the inheritance passed to the representative of a younger Bohemian branch, Charles Egon, a prince memorable for the liberal spirit by which he was actuated, and for the number of his benevolent and scientific foundations, such as the infirmary at Donaueschingen and the blind asylum at Neidingen. The family is at present (1879) represented by his son Charles Egon. There are two subordinate branches, the Pürglitz with its chief residence at Lana in Bohemia, and the Königshof with its chief residence at Königshof in Bohemia.

II. The second Fürstenberg family has its possessions in Westphalia and the country of the Rhine, and takes its name from the castle of Fürstenberg on the Ruhr, which is said to have been built by count Dietrich or Theodoric of Oldenberg, in the 11th century. The two most remarkable men whom it has produced are Francis Frederick William and Francis Egon. The former (1729–1811) became ultimately minister of the prince-bishop of Münster, and effected a great number of important reforms in the administration of the country; the latter (1797–1859) was an enthusiastic patron of art, zealously advocating the completion of the Cologne cathedral, and erecting the beautiful church of Apollinaris, near Remagen on the Rhine.

See (for the first family) Münch's *Geschichte des Hauses und Landes Fürstenberg*, Aix-la-Chapelle, 1830–1832, and Riezler, *Fürstenbergisches Urkundenbuch, hrsggbn. von dem fürstlichen Hauptarchiv in Donaueschingen*, 1877, 1878.

FÜRSTENWALDE, a town in the Prussian province of Brandenberg, government of Frankfort, on the right bank of the Spree, and on the railway between Berlin and Frankfort-on-the-Oder, 28 miles E. of the former city. Its beautiful cathedral church contains a good many old monuments. The town possesses manufactures of linen and woollen goods, breweries, meal-mills, tile-works, and a chemical work. Fürstenwalde is one of the oldest towns of Brandenburg. Since 1385 it was the seat of the bishop of Lebus, whose bishopric was incorporated with the duchy of Brunswick in 1595. The town was taken by the Swedes in 1631, and burned by the imperialists in 1633. The population in 1875 was 9688.

FÜRTH, an important manufacturing town of Bavaria, circle of Middle Franconia, at the confluence of the Pegnitz with the Rednitz, 5 miles N.W. of Nuremberg, with which it is connected by railway. It is largely indebted for its importance to the industry and perseverance of the Jews, who at the beginning of the present century composed nearly one-half of the whole population, and now amount to about 3600. They have a college, a separate court of justice, several schools and synagogues, and two Hebrew printing establishments. The principal building of the town is the new town-house, with a tower 215 feet high. The manufactures include mirrors, jewelry, lacquered wares, chandeliers, spectacles, machines of various kinds, turnery wares, surgical instruments, lead pencils, artificial flowers, liqueurs, tobacco, leather, and woollen and cotton goods. There are also several breweries. A large annual fair is held at Michaelmas, which lasts for fourteen days. The population in 1875 was 27,360.

In 1632 Gustavus Adolphus was defeated near Fürth, in attempting to carry the intrenchments of Wallenstein; and in 1634 the town was burned down by the Croats. It was originally under the protection of the burggrafs of Nuremberg, but in 1806 it came into the possession of Bavaria. In the latter half of the 18th century it rose rapidly in importance through its manufactures, but it was not raised to the rank of a town till 1818.

FURZE, GORSE, or WHIN, *Ulex*, Linn. (German, *Stechginster;* French, *Ajonc*), a genus of thorny papilionaceous shrubs, of few species, confined to west and central Europe and north-west Africa. The leaves, except those of seedling plants, which are trifoliate, are exstipulate, and have the form of prickles; the flowers are axillary, yellow, and sweet-scented, and have a colored calyx deeply divided into two concave segments, the upper bi-serrate and the lower tri-serrate at the apex, the carina and alæ obtuse, stamens united into a sheath, style smooth, and stigma capitale. The pods are few-seeded; their crackling as they burst may often be heard in hot weather. Common furze, *U. europæus*, Linn., is found on heaths and commons in western Europe from Denmark to Italy, and in the Canaries and Azores, and is abundant in nearly all parts of the British Isles. It grows to a height of 2–6 feet; it has hairy stems, and the smaller branches end each in a spine; the leaves, sometimes lanceolate on the lowermost branches, are mostly represented by spines from 2 to 6 lines long, and branching at their base; and the flowers, about ¾ inch in length, have a shaggy, yellowish-olive calyx, with two small ovate bracts at its base, and appear in early spring and late autumn. This species comprises the varieties *U. vulgaris*, or *U. europæus* proper, which has spreading branches, and strong, many-ridged spines, and *U. strictus* (Irish furze), with erect branches, and slender 4-edged spines. Its seeds, according to Babington (*Man. Brit. Bot.*, p. 80, 6th ed., 1867), produce either *U. europæus* or *U. strictus*. The other British species of furze is *U. nanus*, Forst., an inmate of Belgium, Spain, and the west of France; it is a procumbent plant, less hairy than *U. europæus*, with smaller and more orange-colored flowers, which spring from the primary spines, and have a nearly smooth calyx, with minute basal bracts. From *U. nanus* have been formed the subspecies *U. eunanus* (Dwarf Furze), common in the south of England, and *U. Galli*, of Planchon, confined in Britain to the western counties, with the exception of Northumberland. During the winter of 1837–38 the furze perished wholly above ground, not only around London, but even in South Wales, Cornwall, and Devonshire; the double *U. europæus* was observed to be more hardy than the wild species, and *U. strictus* suffered more than either. (See *Trans. Hort. Soc. Lond.*, 2d ser., ii. p. 225.) Furze, or gorse, is sometimes employed for fences. On its use as a forage-plant see AGRICULTURE, vol. i. p. 336. In various parts of England it is cut for fuel. The ashes contain a large proportion of alkali, and are a good manure, especially for peaty land.

See Morton, *Cyclopædia of Agriculture*, 1855; J. T. Boswell Syme, *Sowerby's English Botany*, vol. iii. pp. 3–7, 1864; Bentham, *Handbook of British Flora*, vol. i., 1865; J. D. Hooker, *The Student's Flora*.

FUSELI, Henry (1741–1825), an eminent painter and writer on art, was born at Zurich in Switzerland on the 7th February, 1741; he himself asserted, in 1745, but this appears to have been a mere whim. He was the second child in a family of eighteen. His father was John Caspar Füssli, of some note as a painter of portraits and landscapes, and author of *Lives of the Helvetic Painters*. This parent destined his son for the church, and with this view sent him to the Caroline college of his native town, where he received an excellent classical education. One of his schoolmates there was Lavater, with whom he formed an intimate friendship. After taking orders in 1761, Fuseli was obliged to leave his country for a while in consequence of having aided Lavater to expose an unjust magistrate, whose family was still powerful enough to make its vengeance felt. He first travelled through Germany, and then, in 1763, visited England, where he supported himself for some time by miscellaneous writing; there was a sort of project of promoting through his means a regular literary communication between England and Germany. He became in course of time acquainted with Sir Joshua Reynolds, to whom he showed his drawings. By Sir Joshua's advice he then devoted himself wholly to art. In 1770 he made an art-pilgrimage to Italy, where he remained till 1778, changing his name from Füssli to Fuseli, as more Italian-sounding. Early in 1779 he returned to England, taking Zurich on his way. He found a commission awaiting him from Alderman Boydell, who was then organizing his celebrated Shakespeare gallery. Fuseli painted a number of pieces for this patron, and about this time published an English edition of Lavater's work on physiognomy. He likewise gave Cowper some valuable assistance in preparing the translation of Homer. In 1788 Fuseli married Miss Sophia Rawlins (who it appears was originally one of his models, and who proved an affectionate wife), and he soon after became an Associate of the Royal Academy. Two years later he was promoted to the grade of Academician. In 1799 he exhibited a series of paintings from subjects furnished by the works of Milton, with a view to forming a Milton gallery corresponding to Boydell's Shakespeare gallery. The number of the Milton paintings was forty-seven, many of them very large; they were executed at intervals within nine years. This exhibition, which closed in 1800, proved a failure as regards profit. In 1799 also he was appointed professor of painting to the Academy. Four years afterwards he was chosen keeper, and resigned his professorship; but he resumed it in 1810, and continued to hold both offices till his death. In 1805 he brought out an edition of Pilkington's *Lives of the Painters*, which however, did not add much to his reputation. Canova, when on his visit to England, was much taken with Fuseli's works, and on returning to Rome in 1817 caused him to be elected a member of the first class in the Academy of St. Luke. Fuseli, after a life of uninterrupted good health, died at Putney Hill, 16th April, 1825, at the advanced age of eighty-four, and was buried in the crypt of St. Paul's Cathedral. He was comparatively rich at his death, though his professional gains had always appeared to be meagre.

As a painter, Fuseli had a daring invention, was original, fertile in resource, and ever aspiring after the highest forms of excellence. His mind was capable of grasping and realizing the loftiest conceptions, which, however, he often spoiled on the canvas by exaggerating the due proportions of the parts, and throwing his figures into attitudes of fantastic and over-strained contortion. He delighted to select from the region of the supernatural, and pitched everything upon an ideal scale, believing a certain amount of exaggeration necessary in the higher branches of historical painting. "Damn Nature! she always puts me out," was his characteristic exclamation. In this theory he was confirmed by the study of Michelangelo's works and the marble statues of the Monte Cavallo, which, when at Rome, he used often to contemplate in the evening, relieved against a murky sky or illuminated by lightning. But this idea was by him carried out to an excess, not only in the forms, but also in the attitudes of his figures; and the violent and intemperate action which he often displays destroys the grand effect which many of his pieces would otherwise produce. A striking illustration of this occurs in his famous picture of Hamlet breaking from his Attendants to follow the Ghost: Hamlet, it has been said, looks as though he would burst his clothes with convulsive cramps in all his muscles. This intemperance is the grand defect of nearly all Fuseli's compositions. On the other hand, his paintings are never either languid or cold. His figures are full of life and earnestness, and seem to have an object in view which they follow with rigid intensity. Like Rubens he excelled in the art of setting his figures in motion. Though the lofty and terrible was his proper sphere, Fuseli had a fine perception of the ludicrous. The grotesque humor of his fairy scenes, especially those taken from the *Midsummer Night's Dream*, is in its way not less remarkable than the poetic power of his more ambitious works. As a colorist Fuseli has but small claims to distinction. He scorned to set a palette as most artists do; he merely dashed his tints recklessly over it. Not unfrequently he used his paints in the form of a dry powder, which he rubbed up with his pencil with oil, or turpentine, or gold size, regardless of the quantity, and depending for accident on the general effect. This recklessness may perhaps be explained by the fact that he did not paint in oil till he was twenty-five years of age. Despite these drawbacks, he possessed the elements of a great painter.

Fuseli painted more than 200 pictures, but he exhibited only a minority of them. His earliest painting represented Joseph interpreting the Dreams of the Baker and Butler; the first to excite particular attention was the Nightmare, exhibited in 1781. He produced only two portraits. His sketches or designs numbered about 800; they have admirable qualities of invention and design, and are frequently superior to his paintings.

His general powers of mind were large. He was a thorough master of French, Italian, English, and German, and could write in all these tongues with equal facility and vigor, though he preferred German as the vehicle of his thoughts. His writings contain passages of the best art-criticism that English literature can show. The principal work is his series of *Lectures* in the Royal Academy, twelve in number, commenced in 1801.

Many interesting anecdotes of Fuseli, and his relations to contemporary artists, are given in his *Life* by John Knowles, who also edited his works in 3 vols. 8vo, London, 1831. He was a man of abrupt temper, sharp of tongue, energetic in all his ways, in stature short, but robust, with a head full of fire and character.

FUSEL OIL, the name applied to the volatile oily liquids, of a nauseous fiery taste and smell, which are obtained in the rectification of spirituous liquors made by the fermentation of grain, potatoes, the marc of grapes, and other material, and which, as they are of higher boiling-point than ethylic alcohol, occur in largest quantity in the last portions of the distillate. Besides ethylic or ordinary alcohol, and amylic or pentylic alcohol, which are present in them all, there have been found in fusel oils several other bodies of the $C_nH_{2n+1}.OH$ series, also certain ethers, and members of the $C_nH_{2n}O_2$ series of fatty acids. Normal propylic alcohol, $C_3H_7.OH$ is contained in the fusel oil or the marc brandy of the south of France, and isoprimary butylic alcohol, $CH\ (CH_3)_2.CH_2.OH$, in that of beet-root molasses. The chief constituent of the fusel oil procured in the manufacture of alcohol from potatoes and grain, usually known as fusel oil and potato-spirit, is isoprimary amylic alcohol, or isobutylcarbinol, $CH\ (CH_3)_2.CH_2.CH_2.OH$, boiling at 129°–130° C., and inactive as regards polarized light. Ordinary fusel oil yields besides another isomeric amylic alcohol, boiling at about 128°, and lævorotatory. The formation of amylic alcohol is stated by Liebig (*Familiar Letters on Chemistry*, p. 217, 4th ed., 1859) never to take place in fermenting fluids in the presence of tartar, of racemic, tartaric, or citric acid, or of certain bitter substances as hops. It is produced principally in alkaline or neutral liquids, and in such as contain lactic or acetic acid. Schorlemmer (*Proc. Roy. Soc.*, xv., 1866, p. 131) has shown that amyl-compounds prepared from fusel oil and from American petroleum agree in specific gravity and boiling point, and are therefore to be regarded as identical. Variable quantities of fusel oil, less or greater according to the stage of ripening, exist in commercial spirits. Administered in small amount, it exercises a poisonous action, causing thirst and headache, with furred tongue (*Brit. and For. Med.-Chir. Rev.*, xxviii., 1861, p. 101). In crude spirit made from potatoes, after its purification in the cold from noxious gases by means of charcoal, M. Rabuteau found 50 per cent. of ethylic, and 1·5 per cent. of isopropylic alcohol, and traces of propylic, and of ordinary and a more complex amylic alcohol. He discovered that in $\frac{1}{50}$ aqueous solution ethylic alcohol was not injurious to frogs, isopropylic alcohol killed after some hours, and propylic alcohol in a single hour, whilst the vapors of a similar solution of amylic alcohol were instantaneously fatal to them, and even diluted to as much as 500 times its bulk that body exercised on them a poisonous influence. The widely different actions of common alcohol and of such compounds as the potato-oils in intoxicating drinks, he points out, render it necessary to distinguish between the excitable *ethylism* produced by the former, and the dull and heavy *amylism*, or more properly *polyalcoholism*, of the latter. (See *Le Progrès Médical*, 1878, p. 979, "Société de Biologie.") To remove fusel oil from spirits, a matter of prime importance to the distiller, a great number of methods have been resorted to. A practically pure spirit can be obtained by rectification several times after dilution with water, or by the use of specially constructed stills, as Coffey's (see DISTILLATION, vol. vii. p. 231). Among the materials which have been employed for the complete defuselation of spirit are the powder of freshly burnt charcoal, which acts best when the vapor of the liquid is passed through it, and charcoal with manganese peroxide, with slaked lime, and with soap-boilers' lye; also saturated solution of chloride of lime, alone or with zinc chloride; and calcium chloride, olive oil, soda-soap, and milk. The presence of fusel oil in spirit may be suspected when the addition of four parts of water causes milkiness. It is detected by its odor when the spirit is diluted with warm water, or when its ethylic alcohol has been allowed to evaporate. To remove the last-named body and water from fusel oil calcium chloride has been employed. The estimation of the alcohols of fusel oil may be effected by Dupré's process, in which their corresponding acids are obtained by oxidizing with sulphuric acid and potassium dichromate, and eventually the quantity of barium in the barium salts of the purified acids is determined (see *Analyst*, Mar. 31, 1871). Fusel oil is employed in the arts as a source of amylic alcohol.

FUST, JOHANN (? . . . .–1466), often considered as the inventor or one of the inventors of printing, belonged to a rich and respectable burgher family of Mainz, which is known to have flourished from 1423, and to have held many civil and religious offices, but was not related to the patrician family Fuss. The name was always written Fust, until in 1506 Johann Schöffer, in dedicating the German translation of Livy to the emperor Maximilian, called his grandfather Faust. After that the family called themselves Faust, and the Fausts of Aschaffenburg, an old and quite distinct family, placed John Fust in their pedigree as one of their most distinguished ancestors. John's brother Jacob, a goldsmith, was appointed baumeister of the town in 1445, and was first burgomaster in 1462, when Mainz was stormed and sacked by the troops of Count Adolf of Nassau. There is no evidence that, as is commonly asserted, John Fust was himself a goldsmith. He appears to have been a money-lender or banker and speculator, better known for prudence than for uprightness and disinterestedness. His connection with Gutenberg, who is now generally, though not universally, admitted to be the real inventor of printing, has been very variously represented, and Fust has been put forward by some as the inventor of typography, and the instructor as well as the partner of Gutenberg, by others as his patron and benefactor, who saw the value of his discovery and had the courage to supply him with means to carry it out. This view has been the most popular; but during the present century Fust has been frequently painted as a greedy and crafty speculator, who took advantage of Gutenberg's necessity and robbed him of the fruits of his invention. Gutenberg, many years resident in Strasburg, where he was long engaged in the experiments and attempts which resulted in his discovery of typography, is not known to have been there after 1444. His uncle Henne (or Johann) Gutenberg, senior, on 28th October, 1443, took the house in Mainz called Zum Jungen, where Gutenberg afterwards carried on printing. Having already exhausted his own resources in his long-continued and costly experiments, Gutenberg, through his cousin Albrecht Gelthuss zum Echtzeller, borrowed 150 florins in Mainz, 6th October, 1448. This sum was quite insufficient for his purposes, and on 22d August, 1459, as appears from the amount of interest afterwards claimed, he made an agreement with Fust, who was to advance him 800 gold florins to make and procure his tools and materials, which were to be security for the loan. Fust was also to give him 300 florins a year for expenses, wages, house rent, parchment, paper, ink, etc. They were to divide the profits equally, and if they wished to separate, Gutenberg was to return the 800 florins, and the materials were to cease to be security. Fust was to have half the profits, being both holder of a mortgage and partner in the firm. Gutenberg carried on the business at Zum Jungen, where he lived. It is difficult to ascertain precisely what books were printed while the partnership lasted. They first printed, says Trithemius, a vocabulary called *Catholicon*. This was not the *Catholicon* of Johannes de Janua, a folio of 748 pages, 66 lines to a full page, printed in 1460, and now considered to be the work of Gutenberg alone, but was probably a small glossary for children, now lost; they also printed *Donatus de octo partibus orationis*, 27 lines to a page, of which two leaves were discovered in Mainz in the original binding of an account book of 1451. Their greatest work was the Latin Bible known as the *Bible of 42 lines*, because a page contains 42 lines, and also as the Mazarin Bible, because the first copy described was found in the library of Cardinal Mazarin. It was finished at latest in 1455, and is a folio of 1282 printed pages, with spaces left for the illumination of initials, and is in much smaller type than the famous and much-disputed *Bible of 36 lines*, also called the *Bamberg Bible*, because nearly all the known copies were found in the neighborhood of Bamberg. It is also called *Schelhorn's Bible*, because Schelhorn described it in 1760 as the oldest printed Latin Bible, and *Pfister's Bible*, because ascribed to Albert Pfister, a printer of Bamberg, who used the same type for printing many small German books, the chief of which is Boner's *Edelstein*, 1461, 4to, 88 leaves, 85 woodcuts, a book of fables in German rhyme. But many eminent bibliographers believe this Bible to have been printed by Gutenberg, who used the same type in the Letters of Indulgence of 1454, and in the 27-line Donatus of 1451. The types used by Pfister are evidently old and worn, except those of the additional letters required for German, *k*, *w*, *z*, which are clear and sharp like the types used in the Bible. Ulric Zell states, in the Cologne Chronicle of 1499, that Gutenberg and Fust printed the Bible in large type like that used in missals. It has been said that this description applies to the 42-line Bible, as its type is as large as that of most missals earlier than 1500, and that the size now called missal type (double pica) was not used in missals until late in the 16th century. This is no doubt true of the smaller missals printed before 1500, some of which are in even much smaller type than the 42-line Bible. But many of the large folio missals, as that printed at Mainz by Peter Schöffer in 1483, the Carthusian missal printed at Spires by Peter Drach about 1490, and the Dominican missal printed by Andrea de Torresanis at Venice in 1496 are in as large type as the 36-line Bible. It required scarcely less than such a work, says Madden, to induce Fust to advance such large sums of money. Some other smaller works were printed by the partners, as the Papal Letters of Indulgence of 1454–5, granted 12th April, 1451, by Nicolas V., in aid of John II., king of Cyprus, against the Turks, and probably many now lost. Peter Schöffer of Gernsheim, between Mainz and Mannheim, who was a copyist in Paris in 1449, and who is called by Fust his servant (famulus), is said by Trithemius to have discovered an easier way of founding characters. Lambinet and others have concluded from this that Schöffer invented the punch. Schöffer himself, in the colophon of the Psalter of 1457, a work which probably was planned and partly printed by Gutenberg, claims only the mode of printing rubrics and colored capitals. Didot believes that Schöffer discovered the *movable* mould, and that Gutenberg alludes to this discovery and to Schöffer's youth when he says in the colophon of the *Catholicon* of 1460 that God reveals to babes what He hides from the wise. Fust, quite unexpectedly as it seems, and before the profits of the undertaking could be realized, brought a suit against Gutenberg to recover the money he had lent, claiming 2026 florins for principal and interest. He had made a second loan of 800 florins in 1452, but had not paid the 300 florins a year, and, according to Gutenberg, had said that he had no intention of accepting interest. The suit was decided in Fust's favor, 6th November, 1455, in the great refectory of the Barefooted Friars of Mainz, when Fust made oath by all the saints that he had borrowed 1550 florins and given them to Gutenberg. Fust removed the portion of the printing materials covered by his mortgage, which did not include the types of the 36-line Bible, to a house belonging to him called Zum Humbreicht, where he carried on printing with the aid of Peter Schöffer, to whom he gave his only daughter Dyna or Christina in marriage about 1465. Their first publication was the Psalter, 14th August, 1457, a folio of 350 pages, the first printed book with a complete date, and remarkable for the beauty of the large initials printed each in two colors, red and blue, from types made in two pieces, a method patented in England by Solomon Henry in 1780, and by Sir William Congreve in 1819. The Psalter was reprinted with the same types, 1459 (August 29), 1490, 1502 (Schöffer's last publication), and 1516. Fust and Schöffer's other works are given below.[1] In 1464 Adolf of Nassau appointed for the church of St. Quintin three baumeisters, who were to choose twelve chief parishioners as assistants for life. The first of these "Vorvaren," who were named on May-day, 1464, was Johês Fust, and in 1467 Adam Von Hochheim was chosen instead of Johannes Fust. Fust is said to have gone to Paris in 1466, and to have died of the plague, which raged there in August and September. He certainly was in Paris on 4th July, when he gave Louis de Lavernade, a distinguished gentleman of the province of Forez, then chancellor of the Duc de Bourbon and first president of the parliament of Toulouse, a copy of his second edition of Cicero, as appears from a note in Lavernade's own hand at the end of the book, which is now in the library of Geneva. But Fust probably did not die until 30th October, on which day, probably in 1471, an annual mass was instituted for him by Peter Schöffer and Conrad Henlif in the church of St. Victor of Paris, where he was buried.

Fust has been often confounded with the famous magician Dr. Johann Faust, no doubt a real person, though the fables gradually gathered round his name have formed a regular mythical saga. Trithemius speaks in 1507 of Magister Georgius Sabellicus, who called himself Faustus Junior. Conradus Metianus Rufus (Conrad Mudt) in 1513 calls him "quidam chiromanticus Georgius Faustus." But Melanchthon (Manlius, *Collectanea communium Locorum*, 1568, p. 39), and the author of the oldest popular history of Faust, call the magician John, which name has been adopted in the popular books and generally accepted. This change of name, which has been variously explained, allowed the confused traditional remembrance of the printer to be worked into the Faust saga, perhaps the more readily as in his colophons Fust said that his books were not made with pen or pencil, "sed arte quædam perpulchra." The confusion has been much assisted by the story of Fust's supposed prosecution for magic, which, widely credited, and frequently repeated as an authentic anecdote, seems to have been first mentioned by Johannes Walchius in his *Decas fabularum humani generis*, Argentorati, 1610, fol. 181. He states on the authority of Hendrik van Schore or Schorus, a Flemish author, then an old man and provost of Surburg, that when Fust sold his Bibles in Paris, the purchasers, surprised to find all the copies agree exactly in every letter, complained of deception ("a Fausto falsos ac deceptos se clamabant"), and bringing back their books demanded their money, and pursued him even in Mainz, so that to escape he removed to Strasburg. Johann Conrad Dürr, professor of theology at Altdorf, wrote an *Epistola de Johanne Fausto*, dated 18th July, 1676, which Schelhorn printed in 1726, in his *Amœnitates Literariæ*, vol. v. pp. 50–80. Dürr (after relating from Emmanuel van Meteren the tale of Koster's types being stolen on Christmas eve by John Fust his workman, who fled to Amsterdam, then to Cologne, and lastly to Mainz) says that, on showing his books, Fust was suspected of magic, as he could print in one day as much as several men could write in a year, and as the monks and nuns, who had long made great profits by copying, found their kitchens grow cold, and their bright fires extinguished, Fust incurred their hatred and calumny, and was transformed into a magician; and this opinion was confirmed by his printing the *Doctrinale Alexandri* (*i. e., Doctrinale Alexandri Galli*, a most popular mediæval Latin grammar), which gave rise to the story that Faust had caused Alexander the Great to appear to Charles V. Lacaille (*Histoire de l'Imprimerie*, Paris, 1689, p. 12) repeats the story of Fust selling his Bibles in Paris, and adds, as Marchand (*Hist. de l'Imprimerie*, La Haye, 1740, p. 27) says, out of his own head ("avance de son chef"), that the purchasers brought a suit against Fust accusing him of magic, so that he had to escape to Mainz, but the parliament of Paris made a decree discharging Fust of all prosecutions as to the sale of his Bibles. The whole story, as Bernard says, is very improbable and scarcely deserves a serious refutation. There is no proof that the monks were hostile to printing, or that it interfered with the profits of the copyists. On the contrary many books were printed by monks, the early printers often set up their presses in monasteries, and Gutenberg, Fust, and Schöffer were on friendly terms with many conventual houses. Dürr himself quotes from the *Chronicle* of Aventinus a statement that, if printing had not been discovered, the old books would have been lost, as they would no longer write in the monasteries. Printing did the mechanical work, and multiplied the material for calligraphy and illumination, and therefore did not at first interfere with the profits of the scribes or excite their hostility. The learned men who bought books in 1463 cannot have been ignorant of the invention of printing, which the colophon of the Bible of 1462 expressly mentions. No trace of a suit against Fust has been found in the registers of the parliament of Paris. Shortly before his death Fust was known in Paris to Louis de Lavernade, a magistrate of the highest rank, who could have had no intercourse with a man accused of magic. The confusion is especially seen in the German puppet plays even now placing Dr. Faust in Mainz, while the popular histories make him dwell in Wittenberg, the birthplace of Protestantism, where Marlowe's *Tragical History of Dr. Faustus*, founded on the prose history, places him. Many writers have accepted Dürr's error (see Ristelhuber, *Faust dans l'histoire et la legende*, Paris, 1863, p. 173); thus Chasles (*Études sur le moyen âge*, p. 398) calls Fust "magicien à barbe blanche," and Victor Hugo's introduction to Marlowe's play is based on this error, which, says Heine (*Ueber Deutschland*), "is widely spread among the people. They identify the two Fausts because they perceived indistinctly that the mode of thought represented by the magicians found its most formidable means of diffusion in the discovery of printing. This mode, however, is thought itself as opposed to the blind Credo of the Middle Ages."

Authorities.—Schaab, *Die Geschichte der Erfindung der Buchdruckerkunst*, Mainz, 1830–31, 8vo, 3 vols.; De Vinne, *The Invention of Printing*, New York, 1876, 8vo; Bernard, *De l'origine et des débuts de l'Imprimerie en Europe*, Paris, 1853, 8vo, 2 vols.; Madden, *Lettres d'un Bibliographe*, Versailles, 1868–75, 8vo, 2 vols.; Falkenstein, *Geschichte der Buchdruckerkunst*, Leipzig, 1840, 4to; Van der Linde, *The Haarlem Legend*, translated by J. H. Hessels, London, 1871, 8vo; Köhler, *Hochverdiente und aus bewahrten Urkunden wohlbeglaubte Ehrenrettung Johann Gutenbergs*, Leipzig, 1743, 4to; Wurdtwein, *Bibliotheca Moguntina*, August. Vindelicorum, 1787, 4to; Schwartz, *Primaria quædam documenta de origine typographiæ*, Altorf, 1740, 8vo; Schelhorn, *De antiquissima Latinor. Bibliorum editione*, Ulmæ, 1760, 4to; *Beiträge zur Geschichte des Buchhandels*, Leipzig, 1864, 4to; Trithemius, *Annales Hirsaugienses*, Typis Monasterii S. Galli, 1690, fol., 2 vols.; *Cronica van der Hilliger Stat. van Coellen*, Cologne, 1499, fol.; Joannis, *Rerum Moguntiacarum*, Francofurti ad Mœnum, 1722–27, fol., 3 vols. (P. A. L.)

FUSTIAN, a term which includes a variety of heavy woven cotton fabrics, chiefly prepared for men's wear. It embraces plain twilled cloth called jean, and cut fabrics similar to velvet, known as velveteen, moleskin, corduroy, etc. The operations connected with the finishing of cut fustian (cutting, brushing, and singeing, etc.) are conducted under unhealthy conditions. The name is said to be derived from El-Fustat, a suburb of Cairo (see vol. vii. p. 667), where it was first made; and certainly a kind of cloth has been long known under that name. In a petition to parliament, *temp.* Philip and Mary, "fustian of Naples" is mentioned, and in books of a later time this term was abridged to fustiananapes, whence arose an obvious corruption, fustian and apes.

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[1] 3. Durandus, *Rationale divinorum officiorum*, 1459, folio, 160 leaves; 4. the *Clementine Constitutions*, with the gloss of Johannes Andreæ, 1460, 51 leaves; 5. *Biblia Sacra Latina*, 1462, fol., 2 vols., 242 and 239 leaves, 48 lines to a full page; 6. the Sixth Book of Decretals, with Andreæ's gloss, 17th December, 1465, fol., 141 leaves; 7. Cicero *De Officiis*, 1465, 4to, 88 leaves, the first edition of a Latin classic, the first book containing Greek characters, while in the colophon Fust first calls Schöffer "puerum suum"; 8. the same, 4th February, 1466; 9. *Grammatica rhytmica*, 1466, fol., 11 leaves. They also printed in 1461–2 several papal bulls, proclamations of Adolf of Nassau, etc. Nothing is known to have appeared for three years after the storming of Mainz, 8th October, 1465.

FUSTIC, or YELLOW WOOD, also known as old fustic (Germ. *Gelbholz*, Fr. *Bois jaune*), is a dye-stuff consisting of the wood of *Maclura tinctoria*, Don, a large tree of the natural order *Moraceæ*, growing in the West Indies and tropical America, and having oblong, taper-pointed leaves, and an edible fruit. Fustic occurs in commerce in blocks, which are brown without, and of a brownish-yellow within. It is sometimes employed for inlaid work. For its use in the dyeing of yellow and other colors, see vol. vii. pp. 499, 501. The dye-stuff termed young fustic or Zante fustic, and also Venetian sumach, is the wood of *Rhus Cotinus*, Linn., a southern European and Asiatic shrub of the natural order *Anacardiaceæ*, called by Gerarde "red sumach," and apparently the "coccygia" and "cotinus" of Pliny (*Nat. Hist.*, xiii. 41, xvi. 30). Its leaves are deciduous, stiff, smooth, obovate, simple, and rounded at the apex, with long petioles; the blossoms are small, pale-purplish or flesh-colored, and in loose panicles, and their pedicels, after the flowering is over, become long and hairy, forming together, as Gerarde remarks, "a most fine woollie or stockie tuft, crisped and curled like a curious wrought silken fleece" (*The Herball*, p. 1293, 1597). The plant in its native habitat is used both for dyeing and tanning, and by Loudon (*Arboretum*, vol. ii. p. 550) it is recommended for ornamental purposes.

FUTTEHPOOR. See FATHIPUR.

FUX, JOHANN JOSEPH (1661–1741), the composer of more than 400 works of various kinds and dimensions, but chiefly remembered as the author of a theoretical work on music. He was born in 1660 at Marein in Styria, probably of poor parents. Of his youth and early training nothing is known. All we can ascertain is that in 1696 he was organist at one of the principal churches of Vienna, and in 1698 was appointed by the emperor Leopold I. as his "imperial court composer," with the by no means inconsiderable salary of about £6 a month. At the court of Leopold and of his successors Joseph I. and Charles VI., Fux remained for the rest of his life. To his various court dignities that of organist at St. Stephen's cathedral was added in 1704. As a proof of the high favor in which he was held by the art-loving Charles VI., it is told that at the coronation of that emperor as king of Bohemia in 1723, an opera, *La Constanza e la Fortezza*, especially composed by Fux for the occasion, was given at Prague. The performance took place in an open-air theatre, and the *mise-en-scène* is said to have been of great splendor. Fux at the time was suffering from gout, but in order to enable him to be present at the performance, the emperor had him carried in a litter all the way from Vienna, and a seat in the imperial box was reserved for the composer. Fux died at Vienna in 1741. His life, although passed in the great world, was eventless, and his only troubles arose from the intrigues of his Italian rivals at court. Of the numerous operas which Fux wrote for the amusement of his imperial patrons it is unnecessary to speak. They do not essentially differ from the style of the Italian *opera seria* of the time. Of greater importance are his sacred compositions, psalms, motets, oratorios, and masses, the celebrated *Missa Canonica* amongst the latter. It is an all but unparalleled *tour de force* of learned musicianship, being written entirely in that most difficult of contrapuntal devices—the canon. As a contrapuntist and musical scholar generally, Fux was unsurpassed by any of his contemporaries, and it is owing to these qualities that his great theoretical work, the *Gradus ad Parnassum*, has preserved its importance to the present day. For a long time it remained by far the most thorough treatment of counterpoint and its various developments. The title of the original Latin edition may be given:—*Gradus ad Parnassum sive manuductio ad compositionem musicæ regularem, methoda nova ac certa nondum ante tam exacta ordine in lucem edita, elaborata a Joanne Josepho Fux* (Vienna, 1725). It was translated into most European languages during the 18th century, and is still studied by musicians interested in the history of their art. The expenses of the publication were defrayed by the emperor Charles VI., to whom the musical world most probably owes the survival of the important work. Fux's biography, a book full of minutest original research, and trustworthy in every respect, has recently been published by Ludwig von Köchel (Vienna, 1871). It contains, amongst other valuable materials, a complete catalogue of the composer's numerous works. (F. H.)

FYT, JOHANNES (1609–1661), the best painter of animals and game after Franz Snyders, was born at Antwerp and christened August 19, 1609. He was registered apprentice to Hans van den Berghe in 1621. That he should have been placed thus early under the tuition of a man who held but a humble station amongst his artist contemporaries can only be explained by stating that Van den Berghe was the friend of Fyt's father and had already taught Jacques Fyt, Johannes's brother. Professionally Van den Berghe was a restorer of old pictures rather than a painter of new ones. At twenty Johannes Fyt entered the guild of St. Luke as a master, and from that time till his death in 1661, he produced a vast number of pictures in which the bold facility of Snyders is united to the powerful effects of Rembrandt, and harmonies of gorgeous tone are not less conspicuous than freedom of touch and a true semblance of nature. There never was such a master of technical processes as Fyt in the rendering of animal life in its most varied forms. He may have been less correct in outline, less bold in action than Snyders, but he was much more skilful and more true in the reproduction of the coat of deer, dogs, greyhounds, hares, and monkeys, whilst in realizing the plumage of peacocks, woodcocks, ducks, hawks, and cocks and hens, he had not his equal, nor was any artist even of the Dutch school more effective in relieving his compositions with accessories of tinted cloth, porcelain ware, vases, and fruit. He was not clever at figures, and he sometimes trusted for these to the co-operation of Cornelius Schut or Willeborts, whilst his architectural backgrounds were sometimes executed by Quellyn. Silenus amongst Fruit and Flowers, in the Harrach collection at Vienna, Diana and her Nymphs with the Produce of the Chase, in the Belvedere at Vienna, and Dead Game and Fruit in front of a Triumphal Arch, belonging to Baron Anselm von Rothschild at Vienna, are specimens of the co-operation respectively of Schut, Willeborts, and Quellyn. They are also Fyt's masterpieces. The earliest dated work of the master is a cat grabbing at a piece of dead poultry near a hare and birds, belonging to Baron Cetto at Munich, and executed in 1644. The latest is a Dead Snipe with Ducks, of 1660, sold with the Jäger collection at Cologne in 1871. Great power is shown in the bear and boar hunts at Munich and Ravensworth castle. A Hunted Roedeer with Dogs in the Water, in the Berlin Museum, has some of the life and more of the roughness of Snyders, but lacks variety of tint and finish. A splendid specimen is the Page and Parrot near a table covered with game, guarded by a dog staring at a monkey, in the collection of Sir Richard Wallace. It is curious that Antwerp should possess only two examples of Fyt. The Madrid Museum contains 11, the Lichtenstein Gallery at Vienna 8, the Berlin, Vienna, and Dresden Museums 5 each, the Louvre 3, and the London National Gallery 1. With the needle and the brush Fyt was equally clever. He etched 16 plates, and those representing dogs are of their kind unique. (J. A. C.)

FYZABAD, another name for FAIZABAD (*q.v.*).

END OF VOLUME NINTH.

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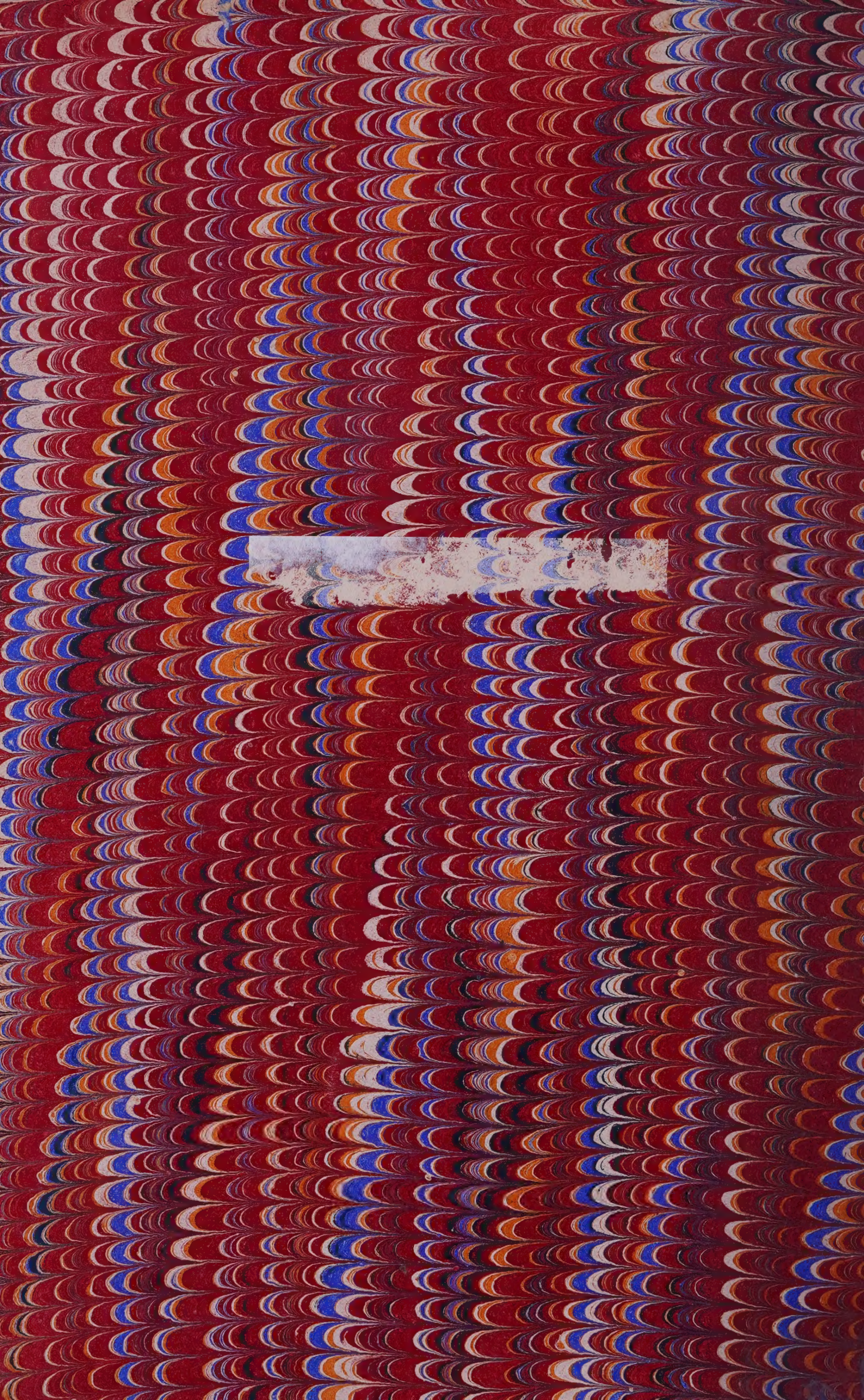

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